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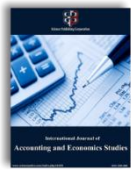

Tech-Driven Banking Revolution: A Bibliometric Analysis and Visualization of Neobanking Research Using Biblioshiny, Vosviewer and Citespace

Aiswarya Cherian [1], Dinesh M. P. [2], Josiah John [3], Dawn Joseph [4], Suresh T. [5], Jobin Jose [6]*

[1] Research Scholar, St.Mary's College, Sulthan Bathery, University of Calicut, Kerala, India
[2] Government College Mokeri, Kozhikode, Kerala, India
[3] Department of Economics, St. George College, Aruvithura, Kerala, India
[4] Department of Economics, St. George College, Aruvithura, Kerala, India
[5] Research Scholar, St Thomas College, Palai, Kerala
[6] Marian College, Kuttikkanam, Autonomous, Kerala, India
**Corresponding author E-mail: jobinjobinjo@gmail.com*

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Abstract

Neobanking refers to digital-only banking platforms that deliver financial services exclusively through mobile applications and web interfaces, without the need for physical branches. This bibliometric analysis investigates the global research landscape on neobanking using data retrieved from the Scopus database. The study employs three specialized tools—Biblioshiny, VOSviewer, and CiteSpace—to analyze publication trends, scholarly impact, and thematic development within the domain. Key findings highlight a steady rise in scientific output, particularly after 2015, with significant contributions from countries such as Indonesia, India, and the United States. The analysis identifies top influential researchers and journals that have shaped the discourse across finance, technology, and digital transformation. Visual network analyses reveal co-authorship patterns, intellectual linkages through co-cited authors and journals, and document-level connections via bibliographic coupling. Keyword co-occurrence maps and thematic evolution charts trace the shift from financial inclusion and mobile banking to recent emphases on fintech, trust, and digital transformation. The thematic map classifies motor themes like digital banking and neobanks as well-developed and central, while signaling emerging interest in user experience and regulatory frameworks. Trend analysis underscores a transition from foundational access-based models to innovation-driven financial ecosystems. The study concludes by identifying research gaps and practical implications, emphasizing the need for integrative approaches that address technological, behavioral, and regulatory dimensions of neobanking.

Keywords: *Neobanking; Virtual Banking; Digital-Only Banking; Bibliometric Analysis; Biblioshiny; VOSviewer; CiteSpace.*

1. Introduction

In recent years, the financial services landscape has undergone a transformative shift with the emergence of neobanking (Shanti et al., 2024; Voshchak, 2024). Unlike traditional banks that operate through physical branches, neobanks are digital-only financial institutions offering banking services via mobile applications and web platforms (Palit, 2024; Sabbani, 2024). These banks leverage cutting-edge technologies such as artificial intelligence, machine learning, application programming interfaces (APIs), and cloud computing to streamline operations, personalize user experience, and reduce operational costs (M et al., 2025; Voshchak, 2024). By eliminating the need for brick-and-mortar infrastructure, neobanks have been able to offer services with greater convenience, transparency, and affordability (Jagrič & Amon, 2023; Vaishnavi & Sandeepthi, 2024).

Neobanks have gained significant traction among tech-savvy consumers, freelancers, small businesses, and underserved populations who seek flexible, user-friendly, and low-cost banking solutions (FathimaFebeena & Nishad, 2024; Palit, 2024). Their services range from savings and current accounts to expense tracking, payment solutions, loans, and investment services (Sabbani, 2024). This disruption has not only challenged traditional banking models but also catalyzed a broader digital transformation in the financial ecosystem (Albastaki et al., 2022; Sardar & Anjaria, 2023). The adoption of real-time analytics, biometric authentication, and seamless onboarding processes exemplifies the innovative potential of neobanks in reshaping customer engagement (Potaraju, 2025; Voshchak, 2024).

Although neobanks have grown rapidly and gained popularity, they face several challenges (Kapliar et al., 2023). Regulatory uncertainty, cybersecurity issues, customer trust, and scalability continue to be significant concerns (M et al., 2025; Vaishnavi & Sandeepthi, 2024). Moreover, the absence of a physical presence sometimes hinders their ability to cater to certain segments of the population who value personal interaction in financial matters (Nagy et al., 2023; Palit, 2024). Nevertheless, the competitive advantage offered by neobanks

continues to attract venture capital funding and strategic partnerships with fintechs and legacy banks, further enhancing their market position and credibility (Amon et al., 2024; Palit, 2024).

As neobanks redesign the banking sector, it is increasingly important to comprehend the academic discussion of this trend (Amon et al., 2024; Citterio et al., 2024). The literature on neobanking has crossed disciplinary borders in fields ranging from finance, information technology, and consumer behavior to risk management and regulatory studies (Kapliar et al., 2023; Nithyakirrthy et al., 2024). This burgeoning literature mirrors the changing dynamics, implications, and directions of digital-led banking (Bradford, 2020). A mapping of this knowledge space can provide useful insights into contemporary trends, research agendas, and intellectual roots.

The accelerating digitalization of financial innovation, particularly following the pandemic, drove neobanking into the focus of industry practices and research interests (Kalyta et al., 2024). With the digital intermediation of financial services further gaining traction, the effects of neobanking on technology, economics, and sociocultural aspects have become the central issue among researchers and policymakers (Sudianjaya et al., 2024). The field of neobanking has expanded rapidly, yet it remains fragmented across various disciplines and publication media (Sudianjaya et al., 2024). For the purpose of integrating the expanding knowledge base, a bibliometric analysis offers a strategic tool for delineating the structure, development, and future orientation of scientific research on neobanking (Mall et al., 2024).

The present work proposes to investigate the scientific literature on neobanking using bibliometric methods for determining influential publications, prominent authors, major journals, thematic patterns, and collaborative patterns. The analysis only includes research articles and review articles indexed on the Scopus database (Gavel & Iselid, 2008). The time span considered for the analysis is a predetermined one in order to reflect the course and evolution of research on neobanking (Mall et al., 2024). The research work belongs to the interdisciplinary category and includes the contributions of finance, technology, business strategy, and regulatory research, and therefore gives a panoramic view of the intellectual heritage of the research on neobanking.

Bibliometric analysis is a quantitative method for the discovery of patterns of scholarly literature (Abas et al., 2023; Agac et al., 2023; Jose et al., 2024). In the process of examining publication output, citation networks, and keyword co-occurrences, bibliometric studies present a bird's-eye view perspective on the temporally evolving development of a research field (Alavi et al., 2024; JOSEPH et al., 2023). For neobanking, a bibliometric analysis can be applied for the discovery of the principal research themes, influential scholars, institutional affiliations, country-level contributions, and emerging topics (Agbo et al., 2021; Joseph Jr et al., 2024). The method goes beyond the conventional narrative review based on the provision of objective, data-based insights into the intellectual structure and dynamics of the subject domain (Babu & Thomas, 2022; Joseph et al., 2024).

In order to achieve a powerful and multi-dimensional bibliometric analysis, three specialized tools, namely, Biblioshiny, VOSviewer, and CiteSpace, have been employed for the present study (John et al., 2024; Mathew et al., 2024). The web-based interface for the Bibliometrix R package, which is Biblioshiny, provides a convenient platform for performing descriptive and performance analyses such as annual scientific production, source impact, author productivity, and collaboration indices (Fahamsyah et al., 2023; Racine, 2012; Souza de Cursi, 2023; Waghmare, 2021). It can be utilized for the purpose of data cleaning, normalization, and interactive visualization, and hence is best suited for exploratory analysis and reporting of initial data (Huang et al., 2021; Thangavel & Chandra, 2023).

The VOSviewer and CiteSpace are applied for high-level visual and network analyses (Ding & Yang, 2022; Li et al., 2022). VOSviewer excels at constructing and visualizing bibliometric networks such as co-authorship, citation, co-citation, and keyword co-occurrence maps (Husain & Mustafa, 2023; Kuzior & Sira, 2022; Van Eck & Waltman, 2010). It is distinct for its big-data treatment capability and for generating high-resolution graphical presentations for scientific landscapes (Abbas et al., 2021; Nurhayati et al., 2024). CiteSpace, on the other hand, is scripted for research front discovery, citation bursts, and thematic evolution over time (Chen et al., 2023; Yang et al., 2017). It identifies the most important turning points and intellectual milestones within the literature, and it provides a temporal dimension for the analysis. These tools thus complement each other and provide a holistic view of neobanking research (Ding & Yang, 2022; Xie & Li, 2020).

The primary objective of this study is to conduct a systematic bibliometric analysis of the academic literature on neobanking. Specifically, the study aims to: (1) identify the annual growth and distribution of publications related to neobanking; (2) determine the most productive and influential authors, institutions, and journals in the field; (3) analyze patterns of international collaboration; (4) map the co-citation and bibliographic coupling networks to reveal the intellectual structure; and (5) trace the thematic evolution and emerging trends in neobanking research. Through these objectives, the study seeks to provide valuable insights for researchers, practitioners, and policymakers interested in the future of digital banking.

2. Materials and Methods

The bibliometric dataset for this study was extracted from the Scopus database, widely acknowledged for its extensive coverage of peer-reviewed scientific publications (Gavel & Iselid, 2008; Harzing & Alakangas, 2016). A targeted search strategy was formulated using the query (TITLE-ABS-KEY (neobanking) OR TITLE-ABS-KEY (neobanks) OR TITLE-ABS-KEY (neobank) OR TITLE-ABS-KEY ("virtual bank") OR TITLE-ABS-KEY ("Digital-Only Banking") OR TITLE-ABS-KEY ("Branchless Banking")) to retrieve literature specifically focused on the neobanking domain. This initial search yielded 266 records, including journal articles, conference papers, and book chapters. To ensure the relevance and consistency of the dataset, non-analytical formats such as reviews, conference reviews, data papers, and books were excluded through a systematic screening process. Following this refinement, a total of 238 documents, comprising 89 journal articles, 122 conference papers, and 27 book chapters, were retained for analysis, in line with the PRISMA framework as presented in Figure 1 (Wang et al., 2014).

The cleansed dataset was exported as a CSV and RIS file for the purpose of detailed analysis using Biblioshiny (Bibliometrix R package), VOSviewer, and CiteSpace (version 6.2. R3 Advanced). Each tool served a specialized function within the workflow for bibliometrics: Biblioshiny was used for the performance of descriptive and trend analyses on publication number, author productivity, and source influence; VOSviewer was used for the creation of bibliographic coupling networks and visual representation of patterns for co-occurrence keywords; and CiteSpace was used for citation bursts and monitoring thematic developments throughout time. Together, the tools allowed for a rigorous, multi-dimensional examination into the research space, which disclosed influential contributors, collaboration patterns, and emerging trends within the research space on neobanking.

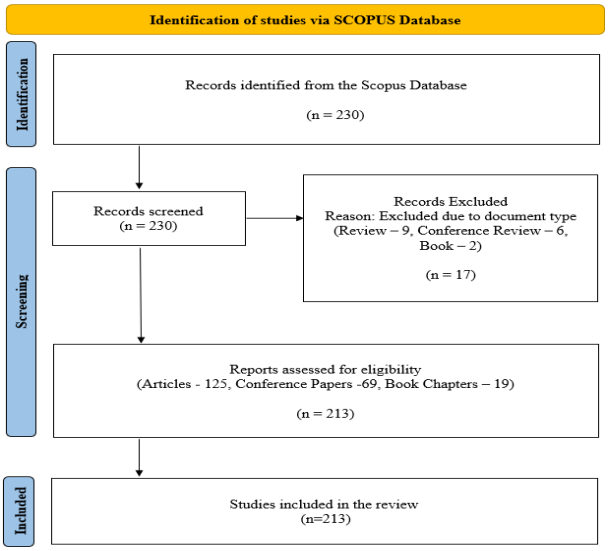

Fig. 1: The PRISMA Flow Diagram Is Used to Identify, Screen, and Include Papers in the Bibliometric Analysis.

3. Findings

3.1. Key information regarding the investigation

The bibliometric analysis of neobanking research, covering the period from 1996 to 2025, reveals a steadily growing body of literature with an annual growth rate of 9.25%. A total of 213 documents drawn from 181 unique sources—including journals, books, and conference proceedings—were examined. These publications have a document average age of 6.33 years and receive an average of 7.911 citations per document, indicating moderate scholarly impact. The dataset includes 8073 references, 1155 Keywords Plus terms, and 623 author-defined keywords, reflecting the thematic diversity of the field. Authorship analysis shows contributions from 612 researchers, with 35 single-authored papers and a co-authorship average of 3.2 authors per document. International collaborations account for 17.84% of all publications, demonstrating a notable level of global scholarly engagement. In terms of document types, journal articles dominate the dataset (125), followed by conference papers (69) and book chapters (19), illustrating the multifaceted academic interest in neobanking.

3.2. Scientific output over the years

Figure 2 illustrates that annual scientific production on neobanking shows a steady and significant upward trend, especially after 2015. From 1996 to 2006, the publication volume remained sparse and inconsistent, reflecting limited academic attention to the topic during its nascent phase. A modest increase began in 2008, and from 2013 onward, there was a steady rise in scholarly output, with noticeable peaks in 2016 (11 articles) and 2018 (13 articles). The field saw a sharp surge in interest from 2019, reaching 18 publications, followed by a temporary dip in 2020. The most remarkable growth occurred between 2021 and 2024, with 2022 and 2024 marking the highest outputs at 30 and 31 publications, respectively. Although the count for 2025 (13 articles) appears lower, it reflects only partial-year data (up to May), suggesting continued strong research momentum. Overall, the trend indicates a maturing field with rapidly growing academic engagement in recent years.

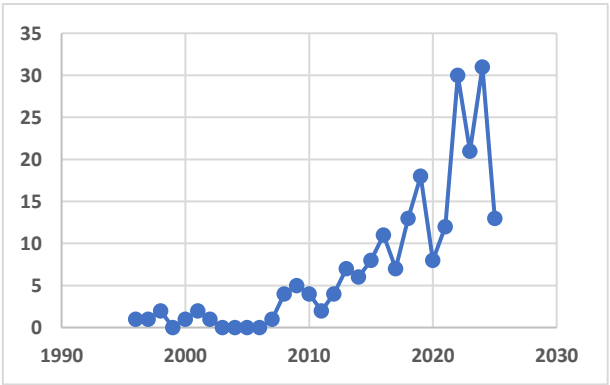

Fig. 2: Annual Scientific Production from 1996 to 2025.

3.3. Top influential researchers

Table 1 presents the top influential researchers contributing to the field, based on the number of publications. Michael J. Becich leads with 6 publications, suggesting a strong research focus and sustained engagement with digital banking themes. A cluster of authors—including Waqas Amin, Puneett Bhatnagar, Nur Mohammad Farda, Rini Rachmawati, Anupama Rajesh, Bowo Setiyono, and M. Vejacka—each with 4 articles, indicates a well-distributed scholarly presence with potential collaborations or overlapping research interests in fintech and neobanking ecosystems. Additionally, Eduardo Diniz and Richa Misra, each with 3 publications, further contribute to the development of this emerging domain. The concentration of articles among these authors reflects both the growing specialization in neobanking studies and the evolving networks of research activity shaping the field.

Table 1: Most Relevant Authors

Authors	Articles
Becich, Michael J.	6
Amin, Waqas	4
Bhatnagr, Puneett	4
Farda, Nur Mohammad	4
Rachmawati, Rini	4
Rajesh, Anupama	4
Setiyono, Bowo	4
Vejacka, M.	4
Diniz, Eduardo	3
Misra, Richa	3

3.3. Prominent scientific journals

Table 2 lists the most prominent scientific journals and conference proceedings that have significantly contributed to the dissemination of neobanking research. The ACM International Conference Proceedings Series leads the list with 7 publications, bearing witness to the predominance of computer science and technology-based conferences where the discourse on neobanking innovations occurs. The Lecture Notes in Computer Science series follows, with articles on artificial intelligence and on bioinformatics, totaling 4 articles, and bearing witness to the technology foundations of the research on neobanking. A set of journals—namely, Electronic Commerce Research and Applications, Enterprise Development and Microfinance, IOP Conference Series: Earth and Environmental Science, Journal of Internet Banking and Commerce, Journal of Risk and Financial Management, Lecture Notes in Networks and Systems, and Sustainability (Switzerland)—published 3 articles, bearing witness to the interdisciplinary concern with neobanking that originates within the fields of finance, development, environmental science, and digital commerce. Environmental Research, with 2 publications, bears witness to a rising concern for the sustainability and environmental dimensions of fintech. Overall, this distribution illustrates the integrative and cross-sectoral nature of scholarly engagement with neobanking.

Table 2: Prominent Scientific Journals

Sources	Articles
ACM International Conference Proceeding Series	7
Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes In Bioinformatics)	4
Electronic Commerce Research and Applications	3
Enterprise Development and Microfinance	3
IOP Conference Series: Earth and Environmental Science	3
Journal of Internet Banking and Commerce	3
Journal of Risk and Financial Management	3
Lecture Notes in Networks and Systems	3
Sustainability (Switzerland)	3
Environmental Research	2

3.4. Global research contributions by nation

Table 3 presents the global research contributions by nation in the field of neobanking, highlighting a diverse and geographically distributed pattern of scholarly engagement. Indonesia leads with 34 documents, followed closely by India with 33, reflecting significant academic interest from rapidly digitizing Asian economies. The United States contributes 28 publications, showing continued leadership among the countries in innovative finance and digital banking research. The United Kingdom and China contributed 13 and 10 documents, respectively, showing their mature fintech ecosystems. The Russian Federation and Pakistan contributed 9 documents each, Brazil and Canada contributed 7 each, and Malaysia contributed 6 publications to the dataset. The publications reported in Table 3 reflect the global relevance of the research on neobanking and the relevance of cross-country insights into its development, adoption, and policy responses.

Table 3: Countries' Scientific Productions

Country/Territory	Documents
Indonesia	34
India	33
United States	28
United Kingdom	13
China	10
Pakistan	9
Russian Federation	9
Brazil	7
Canada	7
Malaysia	6

3.5. Network visualization of countries' collaborations

Figure 3 illustrates the country co-authorship network for work on neobanking and reveals four major clusters based on international collaboration patterns. Cluster #0 (Traditional Banking) contains the most members, with a silhouette score of 0.972 and a total number of members equaling 12. The cluster contains high research activity on the part of nations such as the United States (28 references), Pakistan (9), Canada (7), Brazil (7), and Switzerland (2). Theoretically, the cluster is based on digital transformation of the traditional banks, based on financial literacy, and adoption models for branchless banks. Two notable works belong to Diniz (2012) on ICT-based banks for Brazil and the other by Calderone (2018) on Indian savings behavior, and reveal a blend of mature and developing economies performing collaborative, baseline research on digital financial inclusion.

Cluster #1 (Leveraging Digital Payment Adoption Experience) includes 11 members with a silhouette value of 0.949 and is characterized by contributions from India (32 citations), the United Kingdom (13), China (9), Japan (4), and Iran (4). This cluster reflects a strong Asian

and European research presence focused on advancing neobanking through digital payment systems and emerging technology adoption. Representative articles, such as Taneja (2024) and Salmasi (2024), discuss trust, risk, and green concerns in digital-only banking. These countries demonstrate a growing emphasis on neobanking's alignment with sustainable and consumer-driven innovations, particularly in rapidly digitizing markets like India and China.

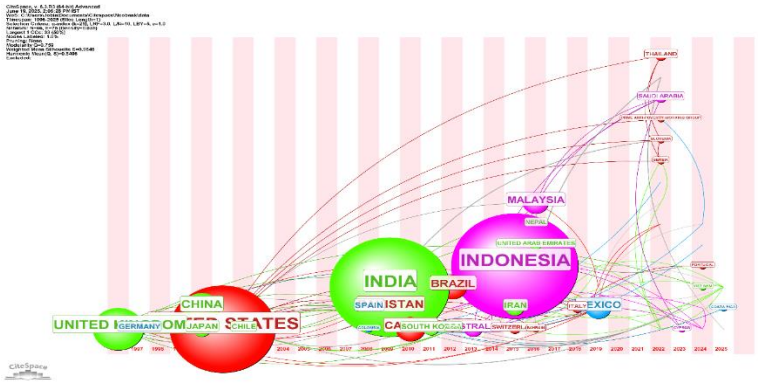

Fig. 3: Timeline Network Visualization of Countries' Collaborations.

3.7. Network visualization of co-citation of cited authors

Figure 4 presents a co-citation network visualization of cited authors in the domain of neobanking research, categorized into 12 distinct clusters based on intellectual similarity. The largest and most prominent cluster, Cluster #0 (Digital-Only Bank), contains 72 members and is marked by a high silhouette value of 0.95, indicating strong internal cohesion. It revolves around themes like customer satisfaction, digital-only adoption, and user behavior. The most cited authors in this cluster—Hair J.F. (26), Venkatesh V. (21), and Davis F.D. (14)—are foundational figures in technology acceptance and behavioral models, underscoring the theoretical grounding of digital banking adoption studies. Articles such as Windasari (2022) and Saif (2022) anchor this cluster, reflecting a focus on Gen Y and Gen Z adoption of digital banking in Southeast Asia.

The second-largest, Cluster #1 (Rural Area) with 59 members, targets branchless banking assistance for enhancing rural financial inclusion and enterprise performance. Lead papers like Mangani (2019) and Ghosh (2014) reveal the support extended by branchless and mobile modes for the growth of the rural communities. Cited influential authors under the cluster include Mas I. (19), Ivatury G. (16), and McKay C. (7), who have been significantly influential for informing the mobile and financial inclusion discourse for underbanked regions. The thematic focus for the cluster aligns the innovation of banks directly with socio-economic empowerment.

Cluster #2 (Branchless Banking), made up of 41 members, addresses the strategic and technological dimensions of adoption for neobanks, often employing the Technology Acceptance Model (TAM). The cluster's pioneering works, authored by Nagy (2024) and László (2024), concern the attitudes and trust among customers in relation to products for neobanks. The most quoted authors are Demirguc-Kunt A., Arner D.W., and Chauhan S., and they examine regulatory, innovation, and digital transformation trends applied within the banking sector. The cluster relates behavioral and institutional perspectives on the development of fintech.

Going a step further, Cluster #4 (Users' Trust) and Cluster #6 (Neobank Service) focus attention on trust, user perceptions, and service excellence on digital and neobank platforms. Researchers such as Zhou T., Lyman T., and Ahmed S. stand out within these clusters, frequently seen as the most cited for their contributions on customer trust models and service design. Specifically, Cluster #8 (Problem) addresses technical and security aspects for branchless banking, which was triggered by pioneering works such as Reaves (2017) and Panjwani (2011), with lead cited authors like Paik M. and Castle S., which validates the security-centric research thread. As a collective group, the above-identified 12 clusters sketch a complete intellectual map encompassing behavioral models, rural effect, fintech innovation, user trust, and cybersecurity, which reflect the multi-facet development process of the research on neobanking.

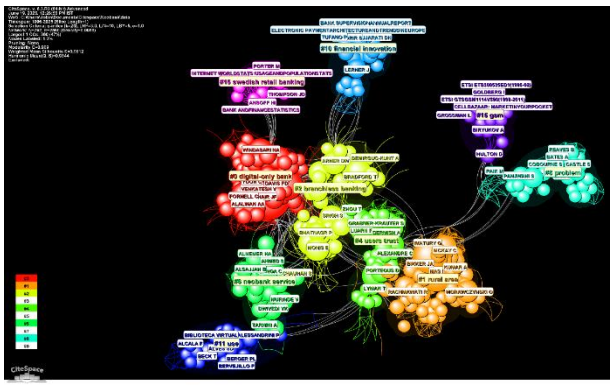

Fig. 4: Network Visualization of Co-Citation of Cited Authors.

3.8. Network visualization of co-citation of cited journals

Figure 5 presents the co-citation network visualization of cited journals in neobanking research, revealing 14 distinct clusters that collectively illustrate the intellectual structure of the field. Cluster #0 (Neobank Service) is the largest, with 94 members and a silhouette value of 0.845. It is dominated by studies focused on consumer adoption, service quality, and technology acceptance models (TAM) applied to neobanking contexts. Influential citing articles include those by Nagy (2024) and Bhatnagar (2024, 2025), which integrate frameworks such as TAM and innovation resistance theory. The most cited journals in this cluster—International Journal of Bank Marketing,

Sustainability, and Electronic Commerce Research and Applications—reflect the centrality of marketing, sustainability, and information systems in shaping service strategies and consumer trust in digital banking platforms.

Cluster #1 (Traditional Electronic), with 63 members and a silhouette value of 0.863, emphasizes foundational research on electronic and branchless banking strategies, especially in developing economies. Key citing works, such as Muthinja (2018) and Reaves (2017), explore the strategic, regulatory, and infrastructural dimensions of mobile banking. This cluster features Journal of Management Information Systems, ACM Transactions on Privacy and Security, and Gates Open Research among its highly cited journals, highlighting its dual emphasis on information systems strategy and financial inclusion. The prominence of studies on Kenya and Indonesia signals the geographic breadth and policy relevance of this research stream.

Cluster #2 (Virtual Global Bank) consists of 44 members with the highest silhouette value (0.958), indicating strong thematic cohesion. This cluster is anchored by the early work of Diniz (2012), which focuses on ICT-enabled financial inclusion in the Amazon. It explores how virtual banking models interact with firm-level innovation, organizational structure, and user engagement. The most cited journals—Academy of Management Review, Administrative Science Quarterly, and California Management Review—suggest that this cluster draws heavily from management theory and organizational behavior, bridging the gap between fintech innovation and corporate transformation in digital banking.

Cluster #4 (Die Virtuelle Bank) and Cluster #3 (Building Society Branch Network) delve into the evolution of virtual banking and the impact of digitalization on traditional banking infrastructure. Cluster #4 (40 members, silhouette value 0.955) includes seminal European contributions that clarify virtual banking terminology and investigate institutional barriers to e-banking. Key journals like Communications of the ACM and ABA Banking Journal point to its focus on early digital banking models and technological feasibility. Cluster #3 (42 members, silhouette value 0.996) analyzes the effect of branchless models on legacy branch networks, especially in the UK context, with Environment and Planning A and SPIE Proceedings as notable outlets. Both clusters show how the digital transition reshaped traditional banking channels while influencing customer engagement and infrastructure policies.

Together, these clusters demonstrate the field's rich interdisciplinary nature, integrating marketing, technology, sociology, management, and economics. The visualization offers a macro-level understanding of how neobanking literature has evolved, from foundational theories of digital transformation to current research on customer-centric service models, security, innovation, and financial inclusion across diverse global contexts.

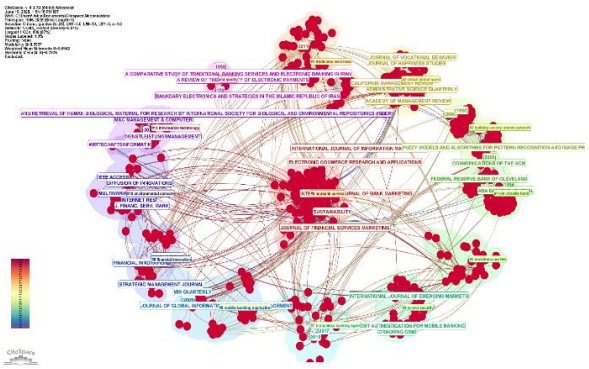

Fig. 5: Timezone Network Visualization of Co-Citation of Cited Journals.

3.9. Network visualization of bibliographic coupling of documents

Figure 6 illustrates the network visualization of bibliographic coupling among documents in neobanking research, based on a minimum citation threshold of 2. Out of 213 documents, 131 met the criteria, with 78 items forming a structured network divided into 9 thematic clusters. The bibliographic coupling, which connects documents according to shared references, manifests intellectual parallels and thematic concordance. Of special interest, papers such as Diniz (2012) in Cluster 1 (red), Windasari (2022) in Cluster 6 (cyan), and Reaves (2015) in Cluster 7 (orange) emerge as central nodes, evidence for their high citation rates and central location within the subject matter. These papers can be seen as central pillars on which other papers are structured thematically and which have been influential for the growth of the literature on neobanking.

The visualisation also shows the connection between various strands of research, where high-density connections between clusters reveal simultaneous themes such as digital transformation, financial inclusion, mobile banking, and customer trust. For example, Kochar (2018) and Muthinja (2018) under Cluster 4 (yellow) have a high correlation with papers under various clusters, which shows their relevance for cross-cutting themes within fintech and adoption of neobanking. The addition of newer studies like Mohamed (2024) and Kusnawi (2023) shows that the literature continues expanding and incorporating newer research. The network map overall shows a flourishing multidisciplinary research ecosystem where classic works are complemented with newer research, which collectively outline the intellectual discourse on neobanking.

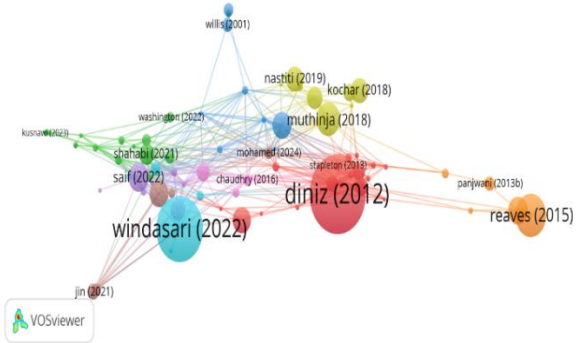

Fig. 6: Network Visualization of Citation of Documents.

3.10. Network visualization of co-occurrence of author keywords

Figure 7 presents an overlay network visualization of author keyword co-occurrence in neobanking research, generated using a minimum occurrence threshold of 2. Out of 613 keywords, 114 met the threshold, and the network visualizes 28 highly interlinked terms organized into 4 clusters. Each node represents a keyword, and its size reflects its frequency of occurrence. The most dominant keywords are branchless banking (51 occurrences), financial inclusion (22), neobanks (16), fintech (12), and neobank (10), indicating the most frequently discussed topics. The proximity and density of links between nodes represent strong thematic relationships, suggesting that these topics frequently co-occur in publications and form the conceptual backbone of neobanking discourse.

The color overlay indicates the temporal dimension, with blue tones representing earlier usage (around 2016) and yellow tones signifying more recent focus (up to 2024). Early studies prominently featured themes like branchless banking, financial inclusion, mobile banking, and microfinance, emphasizing access and infrastructure. In contrast, recent keywords such as neobank, neobanks, digital transformation, data privacy, and fintech (highlighted in green to yellow) signal a shift towards platform-based banking, technological disruption, and innovation. This temporal and thematic transition reflects the evolution of neobanking research from basic access-oriented services to advanced digital financial ecosystems driven by user trust, technological integration, and regulatory considerations.

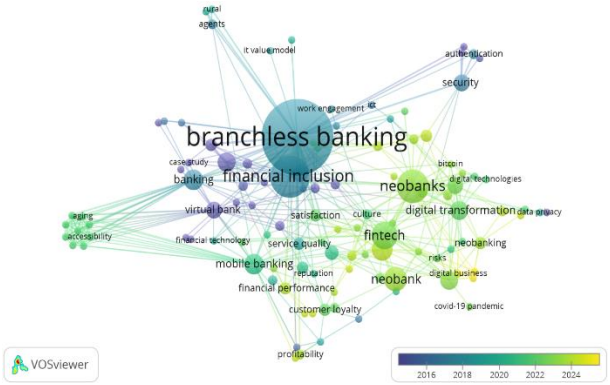

Fig. 7: Co-Occurrence of Author Keywords.

3.11. Thematic evolution

Figure 8 depicts the thematic evolution of neobanking research from 1996 to 2025, showcasing the progression and transformation of core research themes over distinct time intervals. During the early period from 1996 to 2010, the dominant themes were financial inclusion and microfinance, reflecting the academic focus on expanding access to basic financial services in underserved populations. These foundational themes evolved into branchless banking and mobile money during 2011–2015, indicating a shift toward technology-enabled financial delivery mechanisms aimed at enhancing outreach and reducing transaction costs.

From 2016 to 2020, the themes diversified with the emergence of neobanks as a new area of interest, while branchless banking and mobile money continued to maintain relevance. The period between 2021 and 2024 marked a significant expansion of thematic complexity, with the appearance of neobanks and digital banking, alongside continued research on neobank and branchless banking. By 2025, the thematic strands will converge into three dominant areas: branchless banking, neobank, and digital banking, reflecting a mature and technology-integrated research landscape. This thematic transition underscores the academic community's evolving interest from financial accessibility to advanced, platform-driven models of digital banking.

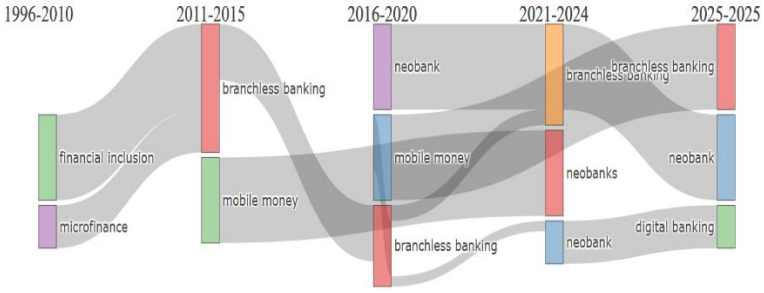

Fig. 8: Thematic Evolution of Research in Neobanking.

3.12. Thematic map

Figure 9 presents the thematic mapping of the literature on neobanking, which plots themes on two dimensions: centrality (how central overall it is) and density (how internally developed it is). The quadrants divide into four motor themes, niche themes, emerging/declining themes, and basic themes—the intellectual structure's various roles. The strategic diagram reveals something about the maturity, the importance, and the interconnectivity of the various research objects falling under the umbrella term neobanking.

In the upper-right quadrant, which is the motor themes, highly developed and central subjects dominate the research field. Clusters like banking, mobile banking, virtual bank, fintech, digital banking, and neobanks are there. Highly influential and well-developed themes themselves, they form the technological core of the neobanking research. High centrality and density indicate that the subjects are central to the discourse and have a rich internal structure and developed research depth.

The upper-left quadrant, under the heading of niche themes, contains themes such as profitability, use of ATMs, and internet banking. These are well-developed maturely but with sketchier links to the wider field, which suggests specialisation or declining relevance. These themes can be good for individual research interests or legacy infrastructure for the wider canvas of banking, but as methodology goes, they have little impact on mainstream debates on neo-banking today.

The lower-right quadrant, representing basic themes, includes branchless banking, financial inclusion, microfinance, customer satisfaction, customer loyalty, and financial performance. These topics are foundational and widely connected but less internally developed, suggesting they are essential to the field's conceptual framework and are often used in conjunction with other topics. Their presence in this quadrant highlights the socio-economic concerns and user-centered dimensions that underpin the adoption and evaluation of neobanking services.
In the lower-left quadrant, we find emerging or declining themes such as electronic banking, COVID-19 pandemic, online banking, neobank (as a singular form), TAM (Technology Acceptance Model), and some unrelated or marginal terms like asbestos, mesothelioma, sms, and USSD. These themes have lower relevance and underdeveloped research structures, indicating that they are either nascent areas yet to gain traction or outdated topics that are losing prominence. The presence of electronic banking and TAM here suggests these may have been earlier frameworks now evolving into more advanced and specific concepts, such as digital banking and behavioral intention.

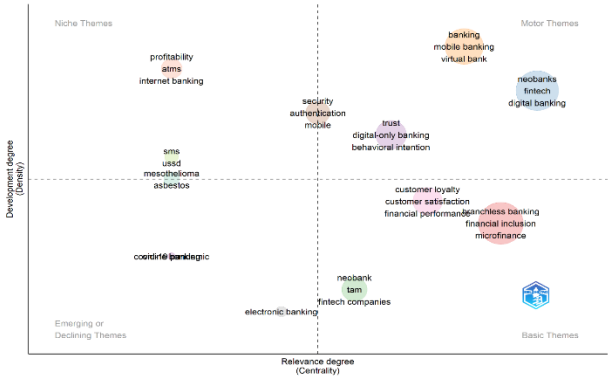

Fig. 9: Thematic Visualization of Keywords.

3.12. Trend topics

Figure 10 highlights the trend topics in neobanking research over time, offering insights into the temporal emergence and evolution of key themes. Early research between 2009 and 2016 focused predominantly on foundational themes such as branchless banking, financial inclusion, microfinance, security, and correspondent banking, indicating an initial academic interest in extending banking services to underserved populations through digital means. Terms like service quality, customer satisfaction, and mobile money gained prominence around 2016–2019, reflecting a growing concern with user experience and performance metrics in digital financial services. The consistent appearance of banking, mobile banking, and virtual banks through this period points to a steady focus on the transformation of traditional banking paradigms.
From 2020 onwards, the field shows a distinct thematic shift towards more advanced and specialized concepts. Terms such as neobank, neobanks, digital banking, fintech, and blockchain began to dominate the discourse, reflecting a transition from access-driven solutions to innovation-centric financial ecosystems. Notably, trust, customer loyalty, and digital transformation appear as frequent and recent terms, suggesting that contemporary research emphasizes both technological advancement and consumer confidence in digital-only banking models. The visibility of the technology acceptance model and behavioral intention also indicates a strong interest in understanding user adoption and behavior in response to neobanking platforms. Overall, the figure illustrates a clear evolution from foundational inclusion-oriented themes to cutting-edge digital finance and user experience topics in recent years.

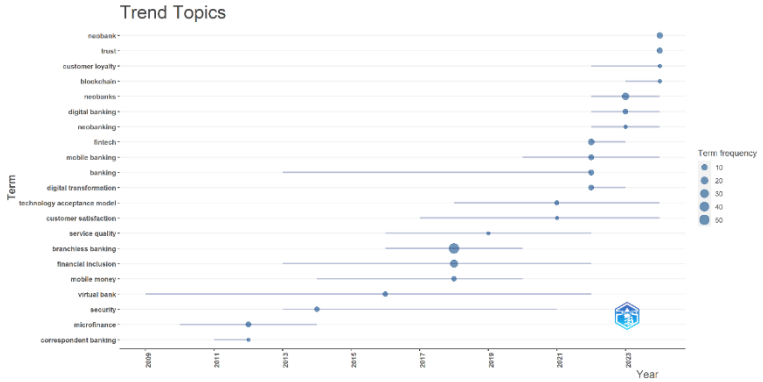

Fig. 10: The Evolution of Trend Topics in Neobanking Research.

4. Discussions

The comprehensive bibliometric analysis presented in this study reveals several pivotal insights into the development, structure, and thematic direction of neobanking research. The field has experienced a consistent growth trajectory since 2015, with an annual increase in publication volume, particularly peaking in 2022 and 2024. This reflects a maturing scholarly interest driven by the rapid expansion of digital finance. Key contributors to this field include prolific authors like Michael J. Becich and Puneett Bhatnagar, alongside multidisciplinary publication venues ranging from computer science conferences to finance and sustainability journals, underlining the technological and socio-economic dimensions of neobanking.
The cluster analysis indicates that neobanking research is strongly anchored in established technology adoption frameworks, particularly the Technology Acceptance Model (TAM). This emphasis highlights how constructs such as perceived usefulness, ease of use, trust, and behavioral intention continue to dominate explanations of how users engage with digital-only banks. At the same time, more recent strands of research point toward complementary perspectives, focusing on issues such as data privacy, customer loyalty, regulatory compliance,

and digital transformation. This suggests that while traditional adoption models provide a solid theoretical foundation, there is a growing need to integrate them with broader socio-technical and experiential dimensions to capture the complexity of contemporary neobanking ecosystems.

The global focus of the neo-bank research is underscored through high country contributions from the United States, India, and Indonesia, and potential for future collaboration across Europe, Asia, and Latin America. The co-authorship network registers thematic foci on digital payment innovations, changes happening in traditional banks, and applications in rural credits. Countries such as India and Indonesia, apart from leadership in the count of publications, also lead the collaborations and reflect the vibrant fintech ecosystems within them. The co-citation analyses between journals and authors also reveal the influence of pioneering behavioral models such as TAM and the incorporation of regulatory, user trust, and technology themes across the set of work.

Visualizations of the network, such as keyword co-occurrence and bibliographic coupling, bring into focus the evolving conceptual focus of neobanking. Financial inclusion and mobile money dominated the early literature, and the preceding years have seen a shift towards higher-order constructs such as fintech, blockchain, digital transformation, and data privacy. Thematic growth and trend-topic analysis reveal a distinct shift away from the attention given to the access-oriented banks towards platform-centric, user-oriented innovations. Trends for the keywords also reveal increasing attention on behavioral intention, trust, and customer loyalty—demonstrative of a hybridization between technological adoption and experience-based research.

Finally, the thematic map confirms the structural maturity of the research region, where the central core includes motor themes such as digital banks, neobanks, and fintech, and branchless banks and financial inclusion remain central. Niche themes such as profitability and ATM infrastructure suggest declining or specialized attention, and future areas such as digital-only banks and trust models have future research potential. Generally, the findings reveal that the research on neobanking has developed into a mature, interdisciplinary region defined by theory diversity, technology innovation, and escalating globalization.

5. Research Gaps and Practical Implications

The insights from the thematic map and trend topics analysis reveal several important research gaps within the neobanking literature. While motor themes such as digital banking, fintech, and neobanks exhibit high centrality and density, indicating a mature research foundation, basic themes like customer satisfaction, loyalty, and financial inclusion remain underdeveloped despite their conceptual significance. This suggests a gap in integrating user-centric dimensions with advanced technological frameworks in neobanking research. Furthermore, emerging or declining themes such as the Technology Acceptance Model (TAM), electronic banking, and behavioral intention—though foundational—appear marginalized in recent studies, indicating a need to revisit and modernize these models to align with current digital banking realities. Additionally, the underrepresentation of trust, risk perception, and data privacy in high-density zones points to a lack of comprehensive studies that holistically address the psychological and regulatory complexities of digital-only banking experiences.

From a practical standpoint, these findings highlight opportunities for innovation and strategic development in the neobanking sector. Future research should deepen investigations into how customer experience, trust, and loyalty evolve in response to new technologies such as blockchain and AI-driven banking interfaces. Regulatory bodies and financial institutions could benefit from empirical studies that re-examine traditional models like TAM in light of contemporary digital behavior, particularly among younger generations. Moreover, addressing sustainability, green finance, and financial literacy—currently peripheral in the thematic structure—can inform inclusive policies for digital banking outreach. The transition of trend topics from financial access to digital transformation emphasizes the need for practitioners to prioritize user experience, ethical innovation, and adaptive policy frameworks in the rapidly evolving neobanking ecosystem.

6. Conclusion

This bibliometric analysis provides a comprehensive overview of the intellectual and thematic evolution of neobanking research over the past three decades. The findings reveal a significant increase in scholarly attention, with growing contributions from diverse geographical regions and disciplines. Core themes such as digital banking, fintech, and neobank services have emerged as central pillars in the literature, while foundational topics like financial inclusion and customer satisfaction continue to provide contextual grounding. However, the analysis also highlights underexplored areas such as data privacy, behavioral intention, and regulatory responses to digital-only banking. It is recommended that future research integrate user trust and data security into existing technology adoption models. Additionally, interdisciplinary collaboration should be encouraged to address the socio-technical challenges posed by neobanking. Finally, policymakers and practitioners are advised to base digital banking strategies on empirical insights that consider both innovation and inclusivity. This study is limited by its reliance on the Scopus database, which, while comprehensive, may not capture all relevant publications indexed in other databases such as Web of Science or Google Scholar. Additionally, the analysis may reflect a degree of language and publication bias, as English-language and peer-reviewed sources are disproportionately represented. Future studies could incorporate multiple databases and non-English literature to provide a more inclusive and exhaustive overview of neobanking research.

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