

Digital Financial Inclusion, Poverty, and Income Inequality: A Bibliometric Analysis of Research Trends and Future Directions

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ABSTRACT

The primary objective of this study is to map scientific articles that examine the role of digital financial inclusion in addressing poverty and income inequality, as well as to develop an analytical framework on recent developments, emerging trends, and future research directions. This study employs a comprehensive bibliometric analysis, including bibliographic coupling and co-word analysis, to develop an analytical framework that captures the latest developments, dominant trends, and future research directions in this field. Through this approach, the study provides a systematic overview of the structure and development of digital financial inclusion research in the academic literature.

Keywords: *Bibliometric analysis, digital financial inclusion, poverty, income inequality.*

ABSTRAK

Tujuan utama penelitian ini adalah memetakan artikel-artikel ilmiah yang membahas peran inklusi keuangan digital dalam mengatasi kemiskinan dan ketimpangan pendapatan, serta menyusun kerangka analitis mengenai perkembangan terkini, tren yang berkembang, dan arah penelitian di masa depan. Penelitian ini menggunakan analisis bibliometrik yang komprehensif, yang mencakup bibliographic coupling dan co-word analysis, untuk mengembangkan kerangka analitis yang mampu menggambarkan perkembangan terbaru, tren yang dominan, dan arah penelitian di bidang ini. Melalui pendekatan tersebut, penelitian ini memberikan gambaran sistematis mengenai struktur dan perkembangan kajian inklusi keuangan digital dalam literatur akademik.

Kata kunci: *Analisis bibliometrik, inklusi keuangan digital, kemiskinan, ketimpangan pendapatan.*



INTRODUCTION

Poverty and economic inequality have always posed complex and persistent global challenges, especially among developing countries, hence remaining major obstacles to the achievement of the Sustainable Development Goals (SDGs) (Bongomin & Ntayi, 2020). Against the backdrop of digitalization, the advancement of digital technology has extensively changed the financial landscape. Innovations in digital financial services—ranging from mobile banking, mobile money, electronic wallets, and other digital payment systems—have created new prospects for increasing access to financial services, especially among previously excluded groups. Digital technology enables financial service providers to expand their outreach to communities located in distant places at a lower cost, with greater speed and broader coverage (Eilu & Auma, 2017; Saha & Qin, 2023).

In the context of empirical studies, many studies have proved that digital financial inclusion helps increase access to financial services for all societal segments, including poor, vulnerable, and marginalized people. Over the past several years, the application of bibliometric analysis in reviewing scientific literature quantitatively has gained more popularity and become widespread among scholars and researchers from different fields of science. Bibliometric research focusing particularly on digital finance's role in alleviating poverty and income inequality is still very scarce, though. The originality of the study is its peculiar focus on the intricate relationship between digital financial inclusion, poverty, and income inequality, by revealing recent advancements, new problems, and future directions. As far as the authors know, this peculiar intersection has not been scrutinized yet.

In general, earlier research based on bibliometric analysis has emphasized concerns about poverty alleviation and income distribution inequality. Hassan et al. (2023) utilized bibliometric analysis in mapping literature relating to poverty alleviation, its different dimensions, and suggesting possible future research directions. Raimi and Phiri (2024) undertook a bibliometric review to study scientific papers on income inequality in Africa. In the same way, Yu and Huang (2021) applied a bibliometric method to investigate the relationship between poverty alleviation and sustainable development in the 21st century. Majeed et al. (2024) reviewed the academic literature on poverty alleviation and sustainable development in the Global South nations. Garg et al. (2024) utilized bibliometric analysis in order to shed light on the contribution of digital technology towards poverty reduction. Additionally, Raghavendra et al. (2023) studied the current status of scholarly literature on the application of Artificial Intelligence (AI) in poverty alleviation.

This study explores a critical gap in the existing literature by focusing on the intersection of digital financial inclusion, poverty alleviation, and income inequality. The findings are expected to offer critical insights for policymakers, practitioners, and other stakeholders in developing viable strategies to promote digital financial inclusion and, at the same time, reduce poverty and income inequality. Through an extensive bibliometric review, this study aims to outline and assess the academic literature to develop an analytical framework that encapsulates recent developments, prevailing trends, and potential directions in this field. The specific objectives of the study are expressed through the following research questions (RQs):

1. What is the recent research trend regarding the digital financial inclusion's contribution to reducing poverty and income inequality in terms of bibliographic coupling?
2. What are the emerging trends, critical topics, and future trends of concern regarding the role of digital financial inclusion in tackling poverty and income inequality, as identified through co-word analysis?

METHODS

Bibliometric research has become an internationally accepted and irreplaceable research instrument in the past decade, enthusiastically adopted by researchers from diverse backgrounds around the globe. With its diversified functions, it measures research productivity at personal and organizational levels, explains global knowledge development trends, identifies knowledge voids, reveals where future research will pay off most, and facilitates evidence-based policy resolutions (Lim and Kumar, 2024). Most of its rising fame can be attributed to information technology advances and leveraging massive

databases sourced from prestigious research indices like Scopus, Web of Science, and Dimensions. In addition, carrying out and processing bibliometric research can now easily be done using visualization programs like VOSviewer, CiteSpace, and the Biblioshiny R package.

Essentially, bibliometric analysis is a quantitative method based on measurement and data analysis of academic literature—i.e., publication frequency and citation, h-index, co-citation, co-word (keyword co-occurrence), and bibliographic coupling. In practice, however, bibliometric analysis is frequently combined with qualitative methods to help interpret thematic trends, guide research agendas, and guide policy-making (McAllister et al., 2022; Lim and Kumar, 2024; Donthu et al., 2021).

This research adopted a systematic bibliometric approach based on the methodological frameworks proposed by Donthu et al. (2021), Lim and Kumar (2024). The bibliometric process was implemented through a series of interconnected stages.

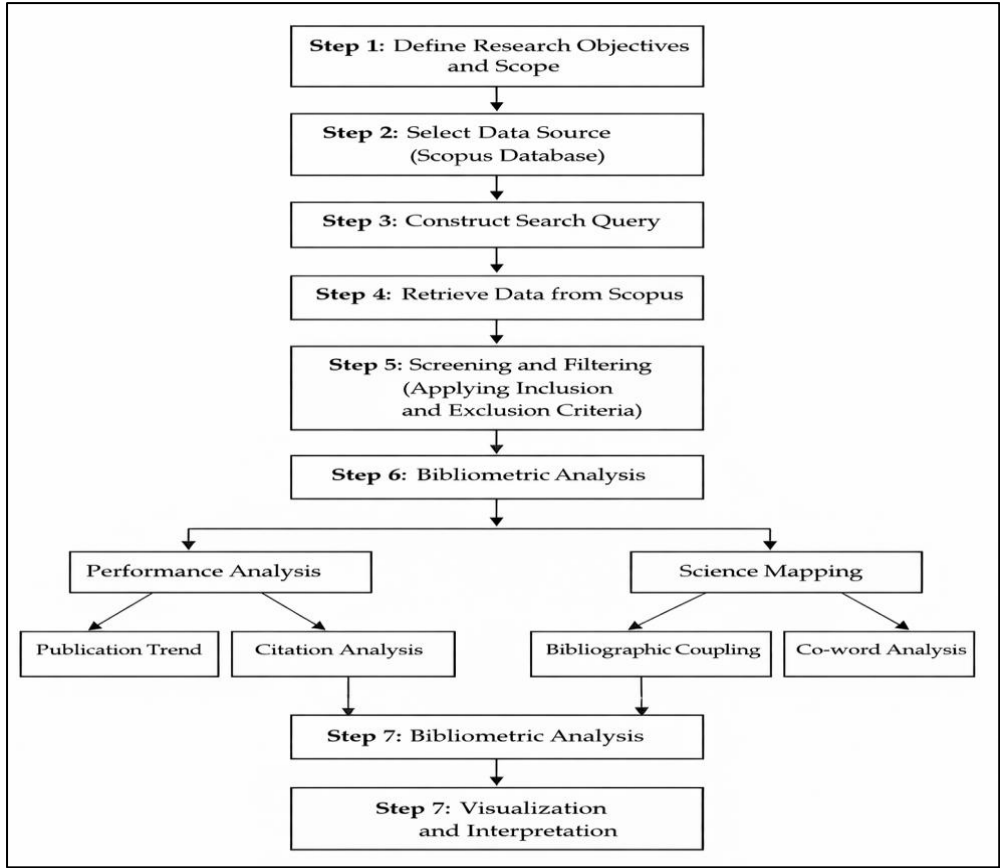


Figure 1. Bibliometric Analysis Procedure

Step 1. Establishing the research focus and boundaries. The initial stage involved formulating the study objectives and research questions to define the scope of the investigation. Particular attention was given to examining the relationship between digital financial inclusion, poverty, and income inequality, while also identifying major research themes, emerging topics, and existing knowledge gaps within the literature. Step 2. Database selection. Scopus was chosen as the source of bibliographic data because of its broad coverage of high-quality academic publications and its strong representation in the fields of economics, finance, and development studies. The database also provides comprehensive metadata that is suitable for advanced bibliometric investigations. Step 3. Development of the search strategy. A structured search strategy was designed using combinations of keywords and their related terms, as shown in Table 1. Boolean operators were employed to connect search terms and improve retrieval accuracy, thereby maximizing the inclusion of relevant studies while reducing the likelihood of overlooking important publications. Step 4. Data collection and export. Relevant records were retrieved from the Scopus database using the predefined search strategy. The resulting dataset was exported in CSV format to support subsequent data processing and analysis using VOSviewer. Step 5. Data screening and refinement. To ensure the reliability and relevance of the

dataset, a screening process was undertaken based on predefined inclusion and exclusion criteria. The study considered peer-reviewed journal articles related to digital financial inclusion, poverty, and income inequality published between 2011 and April 2025. Publications such as conference proceedings, book chapters, editorials, non-English documents, and studies outside the research scope were excluded. Duplicate entries were removed, and the remaining records were evaluated through their titles, abstracts, and keywords to verify their alignment with the research objectives. Step 6. Conducting bibliometric analysis. The final stage involved applying bibliometric techniques using VOSviewer. Specifically, bibliographic coupling, and co-word analysis were performed to examine the intellectual foundations of the field, identify thematic connections among studies, and reveal emerging directions in research on digital financial inclusion, poverty, and income inequality.

Bibliographic Coupling

Bibliographic coupling analysis is a bibliometric mapping technique that provides an updated view of the references drawn from various studies. It aids in the recognition of documents interrelating with citations and helps organize scientific literature through similar bibliographies. The basic premise of this technique is that articles that cite the same citation source are believed to be connected, and the intensity of the connection is based on the number of references they share (Becerra and Ratovicius, 2022). From this technique, researchers can gain a clear picture of research clusters, understand how topics connect, observe how research progresses, and identify current research trends in a field. One of the main advantages of bibliographic coupling analysis is that it can identify recent scientific publications since it does not rely on citation frequency, as in co-citation analysis. Therefore, this method is very effective in identifying new emerging topics and recent publications in a constantly evolving field (Lim and Kumar, 2024; Donthu et al., 2021).

Co-word Analysis

Co-word analysis or keyword co-occurrence analysis is used in bibliometric research to help analyze and map the co-relationship among words employed within scholarly papers. This is useful in tracking trends in research and identifying key themes within specific domains of study. The underlying principle of this method is that words appearing together in the same publication extremely frequently tend to be related to the same research field, and there is a close connection between them. Based on the examination of these pairs of keywords, co-word analysis discloses data on research architecture and how scientific subjects evolve through time (McAllister et al., 2022). The main advantage of co-word analysis is its ability to map keyword relationships and develop an analytical framework that identifies emerging research themes, future research directions, and core topics related to digital financial inclusion, poverty, and income inequality (Lim and Kumar, 2024; Donthu et al., 2021).

Searching Strategy and Data Collection Procedure

Donthu et al. (2021) protocol and procedures were followed to conduct a bibliometric analysis that included co-word analysis and bibliographic coupling. These steps were followed in order: First, the scope and purpose were determined with clarity. Second, a suitable methodology for conducting the bibliometric analysis was chosen. Third, the data necessary for carrying out the analysis were gathered. Fourth, extensive bibliometric analyses were undertaken, and then their results were presented. Data used in bibliometrics were taken from the Scopus database. The extensive repository has 84 million papers and contains in excess of 25,000 peer-reviewed journals from exceeding 7,000 publishers from around the globe. Assurance of quality is provided through the indexing of an exceptionally broad range of journals and through the dependence upon contributions from valuable reviewers (Elsevier B.V., 2023). Spurious process ensures that information retrievable through using Scopus has undergone strict tests according to strict standards regarding scientific validity and reliability (Singh et al., 2021; Elsevier B.V., 2023). Search in Scopus for data involved range of search strings (1-2), as outlined in Table 1.

The Scopus database selectively excludes book chapters, books, and conference proceedings and focuses solely on journal articles. The reason behind this is concerns for peer review quality, source quality, depth of analysis, and citation chance (Cortegiani *et al.*, 2020; Thelwall, 2017; Frandsen, 2022). Only English publications between 2011 and April 2025 are included in the research. Data

were collected on April 24, 2025. The search started from 2011 because there was a significant lack of data and related publications in previous years, leading up to this research.

“The final search query used in the Scopus database was as follows:

TITLE-ABS-KEY(("digital financial inclusion" OR "digital finance" OR "digital financial services" OR fintech OR "mobile banking" OR "mobile money" OR "e-wallet" OR "digital payment" OR "digital microfinance" OR "mobile microfinance") AND ("poverty" OR "poverty alleviation" OR "poverty reduction" OR "income inequality" OR "income disparity" OR "inequality" OR "income distribution")) AND LIMIT-TO(DOCTYPE, "ar") AND LIMIT-TO(LANGUAGE, "English")”

The search results were further limited to publications published between 2011 and April 2025. The literature search was conducted on April 24, 2025.

Table 1. The search string of the Scopus database

No	Keywords	Justification
1	TITLE-ABS-KEY(("digital financial inclusion" OR "digital finance" OR "digital financial services" OR fintech OR "mobile banking" OR "mobile money" OR "e-wallet" OR "digital payment" OR "digital microfinance" OR "mobile microfinance"))	To identify literature related to the role of digital financial inclusion
2	AND ("poverty" OR "poverty alleviation" OR "poverty reduction" OR "income inequality" OR "income disparity" OR "inequality" OR "income distribution"))	To identify literature related to poverty and income inequality

Source: Created by authors based on VOSviewer and bibliometric metadata

RESULTS AND DISCUSSION

Descriptive Analysis

The Scopus database contained 461 scholarly documents, excluding conference proceedings, books, and book chapters. There were 10,023 cited records at a mean rate of 21.74 per document. After deducting self-citations, this was lowered to 9,401. At least 51 documents had been cited 51 times, as approximated by the h-index of 51. The relatively high mean citations per document imply extensive influence and extensive citation within the study field. Throughout the years, both the publications and citations varied, with the initial years (2011) having a very minimal number of publications, reflecting minimal interest or concern from researchers on this matter. From 2023, a steep rise was seen with 111 scientific articles and 2,111 citations, and in 2024 with the maximum number of publications (136) and 3,733 citations. The publication trend in this area is expected to experience a phenomenal surge over the forthcoming years. Figure 2 indicates the publication number and citation trend. Data search was done by the Scopus database through the search term provided in Table 1.

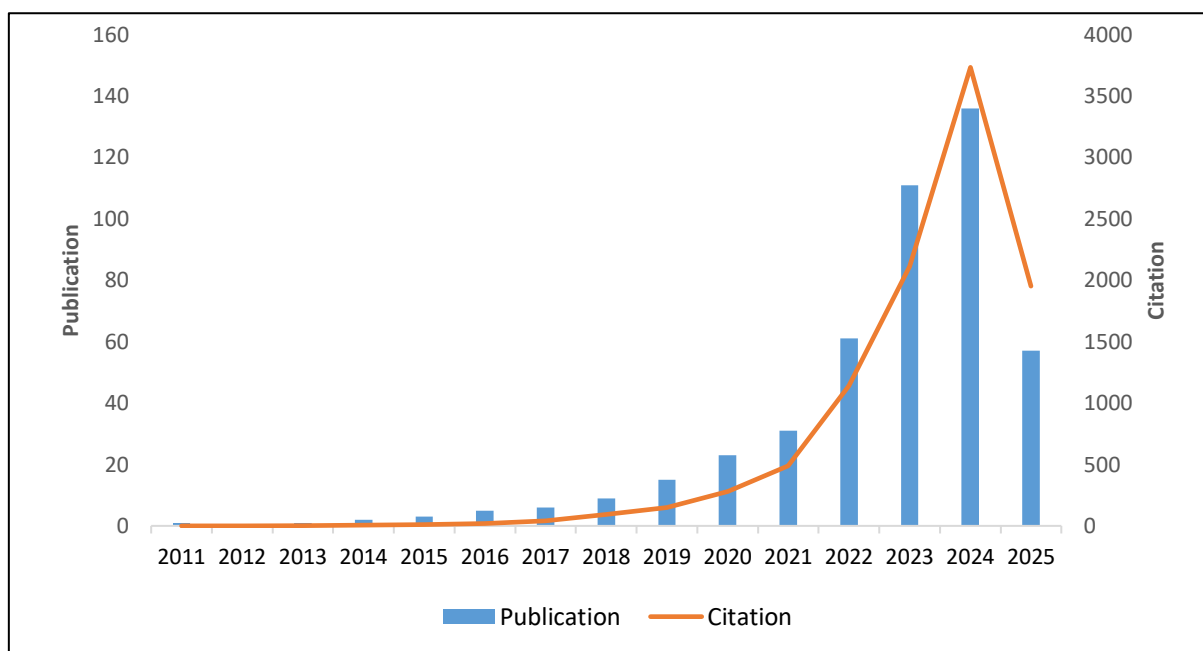


Figure 2. Number of Publications and Citations in The Scopus Database

Results of Bibliographic Coupling Analysis

The bibliographic coupling analysis was conducted to map the current thematic developments and research trends related to digital financial inclusion, poverty, and income inequality. Setting the threshold accurately and appropriately is a crucial step. If the threshold is too low, there is a possibility of repetitive themes and clusters. Conversely, a threshold set too high will create gaps in relevant clusters. From the literature, there are no specific criteria for setting the threshold value (Nawanir and Fauzi, 2024; Geng, *et al.*, 2020). However, many other studies set it through an iterative process by considering various citation levels to produce coherent document clusters (Geng, *et al.*, 2020).

Based on various attempts, optimizing the document clusters in the set to make them meaningful and clear resulted in selecting a threshold of 46. The reason behind this is that thresholds of 47, 48, and 49 are too high, which would result in too few clusters and potentially many relevant documents being overlooked, while 43 and 44 would lead to cluster saturation. A total of 461 documents obtained from the Scopus database were used to conduct the bibliographic coupling analysis. In this case, 59 of these documents were above the threshold, with a lower limit set at 46 for the minimum citations per document. While the citation range for the documents varied from a maximum of 560 to a minimum of 46, the total link strength associated with each document ranged from 71 to 0. This analysis resulted in 4 clusters. The highest citation counts per document were Suri and Jack (2016), Demir *et al.* (2022, and Mushtaq and Bruneau (2019).

Table 2 shows the 10 leading articles with the highest citation counts and their respective bibliographic coupling. In Table 3, the descriptions of the bibliographic coupling clusters are provided. The network visualization of bibliographic coupling is presented in Figure 3.

Table 2. Top 10 document most highly cited articles based on bibliographic coupling

Rank	Publication	No. of citation	Total link strength
1	Suri and Jack (2016). The long-run poverty and gender impacts of mobile money	560	35
2	Demir <i>et al.</i> (2022). Fintech, financial inclusion and income inequality	377	71
3	Mushtaq and Bruneau (2019). Microfinance, financial inclusion and ICT.	244	39
4	Ozili (2021). Financial inclusion research around the world.	239	52
5	Koomson <i>et al.</i> (2020). Effect of financial inclusion on poverty and vulnerability to poverty.	217	53
6	Aziz and Naima (2021). Rethinking digital financial inclusion.	208	37
7	Ren <i>et al.</i> (2023). How does digital finance affect industrial structure upgrading?	196	15
8	Razzaq and Yang (2023). Digital finance and green growth	178	23
9	Demirgüç-Kunt <i>et al.</i> (2020). The global Findex database 2017: Measuring financial inclusion	169	15
10	Lee <i>et al.</i> (2023). Digital financial inclusion and poverty alleviation	150	29

Source (s): Created by authors using VOSviewer and bibliometric metadata

The application of the bibliographic coupling method identified four clusters. Cluster 1 (red), consisting of 14 articles, is categorized as "*Digital finance, Fintech, poverty reduction, and economic transformation.*" Most studies in this cluster highlight the crucial role of digital financial technologies integrated with formal financial services in promoting financial inclusion— particularly in addressing poverty in developing countries (Lee *et al.*, 2023; Wang and Fu, 2022). Technologies such as mobile banking, mobile money (Fintech), and various forms of digital payments play a strategic role in providing easier, faster, and more efficient access to financial services for all population groups, including those previously unbanked, especially in remote and underdeveloped areas (Lee *et al.*, 2023; Wang and Fu, 2022). In this context, Wang and Fu (2022) demonstrated that the utilization of digital financial inclusion provides significant benefits for groups with limited economic opportunities and has a major impact on reducing poverty vulnerability through the use of production capital and human resources within households. Furthermore, this cluster underscores the significant contribution of digital financial systems in supporting and strengthening economic transformation through the integration of digital technology into economic activities, national financial systems, and the empowerment of the informal sector (Ren *et al.*, 2023). Liu *et al.* (2022) found that digital financial inclusion plays a vital role in enhancing access and reducing barriers to formal sources of financing—especially for entrepreneurs and vulnerable groups, which in turn can stimulate entrepreneurial activity.

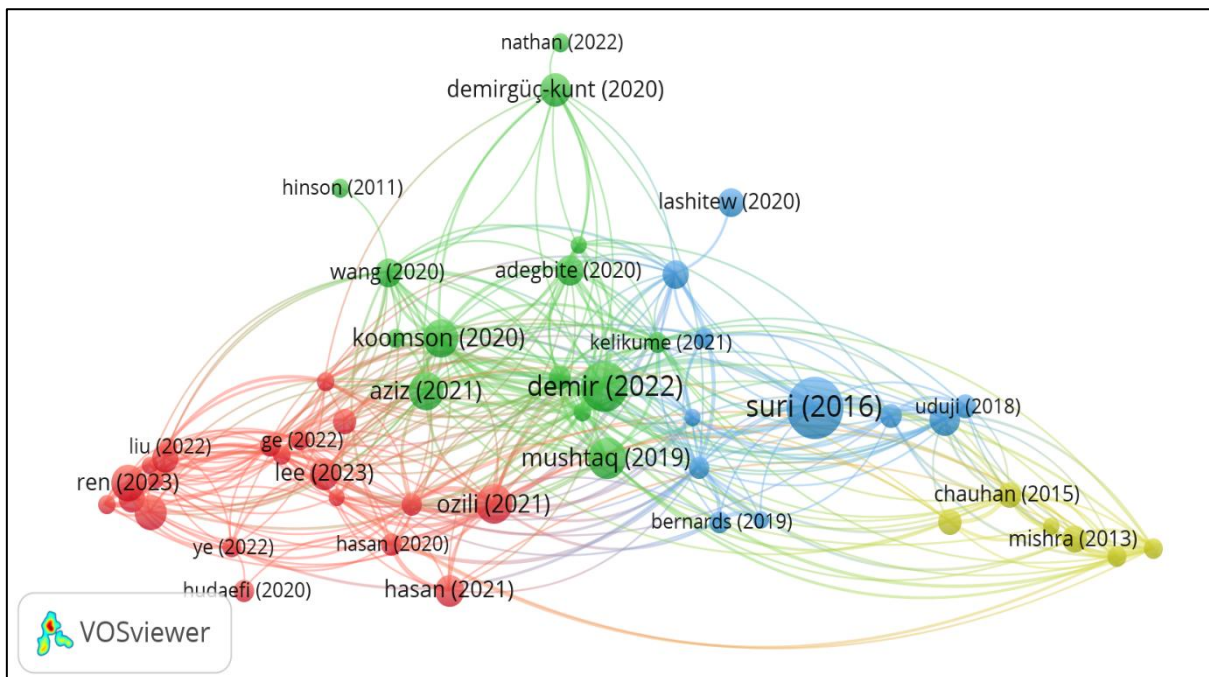
Table 3. The Cluster of Bibliographic Coupling

Cluster, No, and color	Cluster label	Number of articles	Representative articles
1 (red)	Digital finance, Fintech, poverty reduction, and economic transformation	14	Lee <i>et al.</i> (2023); Wang and Fu (2022); Appiah-Otoo and Song (2021); Yang <i>et al.</i> (2022); Li <i>et al.</i> , (2022); Liu <i>et</i>

			<i>al.</i> , 2022); Ren <i>et al.</i> (2023).
2 (green)	Digital financial inclusion, technology, and socioeconomic inequality	12	Demir <i>et al.</i> (2022); Pandey <i>et al.</i> , (2022); N'dri and Kakinaka (2020); Mushtaq and Bruneau (2019); Koomson <i>et al.</i> , 2023; Adegbite and Machethe (2020).
3 (blue)	Mobile money, gender inclusion, and poverty alleviation	9	Sekabira and Qaim (2017); Kim, 2022); Uduji and Okolo-Obasi (2018); Suri and Jack (2016)
4 (yellow)	Mobile banking adoption and pro-poor innovation	6	Asongu and Odhiambo, 2019); (A. Asongu and Nwachukwu (2018); Rahman <i>et al.</i> (2017).

Source (s): Created by authors using VOSviewer and bibliometric metadata

Cluster 2 (green), consisting of 12 articles, is categorized as "*Digital financial inclusion, technology, and socioeconomic inequality.*" Most studies in this cluster emphasize the role of digital financial inclusion services such as mobile banking, mobile money and Fintech, digital credit platforms, and other digital financial payment tools in addressing socioeconomic inequality, particularly income inequality. Socioeconomic factors such as income, education, geographic location, and digital literacy are key determinants that influence household access to digital financial services, and in turn, impact income inequality. Mobile money serves as a bridge to narrow the gap between those without access to formal financial services and broader financial inclusion. By offering easy access, efficient transactions, and minimal administrative requirements, mobile money enables previously excluded groups—such as low-income households—to participate in the financial system, thereby supporting poverty reduction and improving income distribution (N'dri and Kakinaka, 2020; Suhrab *et al.*, 2024). In this context, Demir et al. (2022) indicated that Fintech makes a significant contribution to reducing income inequality, both directly and indirectly, through the enhancement of financial inclusion. Financial inclusion serves as a key channel through which inequality can be reduced across different levels of country inequality. Furthermore, the adoption of Information and Communication Technology (ICT) promotes the enhancement of digital financial inclusion and reduces the financial infrastructure gap. Digital financial inclusion plays a crucial role in reducing poverty and income inequality, both through commercial banks and microfinance institutions (MFIs) (Mushtaq and Bruneau , 2019; Koomson *et al.*, 2023).



Source (s): Created by authors using VOSviewer and bibliometric metadata

Figure 3. Network Visualization of Bibliographic Coupling Analysis

Cluster 3 (blue), consisting of 9 articles, is categorized as "*Mobile money, gender inclusion, and poverty alleviation.*" Most studies in this cluster emphasize the role of mobile money as a key digital financial service, particularly benefiting women, including housewives, in developing countries. The adoption of mobile money helps facilitate financial transactions, supports trade, and increases consumption and financial resilience—ultimately contributing to poverty reduction (Kim, 2022; Islam *et al.*, 2022; Valea, 2024). Sekabira and Qaim (2017) confirmed that the adoption of mobile money plays a significant role in increasing household income and consumption, while also contributing to broader economic benefits by reducing liquidity constraints and facilitating financial transactions, particularly in trade and transport sectors. Furthermore, Kim (2022) highlighted that mobile money plays a crucial role in facilitating financial management and transactions, especially for young and low-income women working in the informal sector. These women benefit from mobile money by securely storing money, conducting financial transactions, and receiving remittances quickly. Similarly, Suri and Jack (2016) demonstrated that mobile money—widely adopted by many female-headed households, especially in developing countries, plays a significant role in boosting consumption and helping them escape poverty through efficient consumption allocation, improved financial resilience, and positive labor market outcomes.

Cluster 4 (yellow), consisting of 6 articles, is categorized as "*Mobile banking adoption and pro-poor innovation.*" Most studies in this cluster emphasize the transformative potential of mobile banking in promoting inclusive financial systems and addressing socioeconomic challenges in developing countries. Asongu and Odhiambo (2019) revealed that the adoption of mobile banking for digital financial transactions—such as receiving and sending money and paying bills—can serve as an effective strategy to tackle issues of income inequality and poverty. Nevertheless, A. Asongu and Nwachukwu (2018) emphasized that while mobile banking represents a significant advancement in digital financial services, its effectiveness in reducing poverty and inequality is highly dependent on the quality of human development in a given country. This suggests that digital financial innovations must be supported by broader

investments in education, health, and institutional capacity to fully realize their pro-poor potential.

Overall, the four bibliographic coupling clusters illustrate that the current literature has evolved from examining the role of individual digital financial services, such as mobile banking and mobile money, toward a broader perspective that integrates digital financial inclusion with poverty alleviation, income inequality, and socio-economic transformation. Although each cluster emphasizes different dimensions, they are conceptually interconnected through the common objective of expanding financial access for underserved populations. This mapping also reveals opportunities for future research to explore the interaction among digital financial innovation, institutional quality, digital literacy, and inclusive development using integrated theoretical and empirical approaches.

Results of Co-word Analysis

A co-occurrence analysis of keywords (co-word analysis) was conducted using the Scopus database. This analysis helps to identify key gaps in the literature, emerging trends, future research directions, critical issues, and topics related to the role of the digital financial inclusion in reducing poverty and income inequality. After several iterations, a threshold of 12 was selected to optimize the document clusters for clarity and relevance. Thresholds of 13, 14, and 15 were deemed too high, resulting in too few clusters and the risk of overlooking relevant documents, while thresholds of 10 and 11 led to cluster saturation (Nawanir and Fauzi, 2024; Geng, *et al.*, 2020).

Table 4. Top 15 Keywords Identified in the Co-occurrence Analysis

Rank	Keywords	Occurrences	Total link strength
1.	Financial inclusion	112	284
2.	Fintech	92	187
3.	China	78	367
4.	Poverty	75	268
5.	Finance	60	294
6.	Digital finance	59	178
7.	Digital financial inclusion	57	138
8.	Mobile money	46	119
9.	Income inequality	44	177
10.	Income distribution	38	172
11.	Sustainable development	37	175
12.	Poverty alleviation	34	141
13.	Economic development	32	180
14.	Financial system	30	161
15.	Financial services	30	128

Source (s): Created by authors using VOSviewer and bibliometric metadata

The minimum number of occurrences of a keyword was set at 12, out of 2,385 eligible keywords, 49 keywords met the threshold. The range of occurrences of the keyword is from a maximum of 112 to a minimum of 12. The range of total link strength associated with each keyword is from a maximum of 367 to a minimum of 21. This analysis produced 4 main clusters. In this analysis, the highest occurring keywords are "financial inclusion" (112), "Fintech" (92), and "China" (78). The top 15 keywords of the keyword co-occurrence are presented in Table 4. The cluster of co-word analysis is shown in Table 5. The network visualization of keyword co-occurrence is illustrated in Figure 4.

The application of the co-word analysis yielded 4 (four) cluster: Cluster 1 (red), consisting of 22 items, is titled “*Mobile innovation for poverty alleviation.*” This cluster focuses on poverty alleviation efforts through the enhancement of financial inclusion by leveraging innovations in digital financial services such as mobile banking, mobile money, and other forms of digital payments. It also includes innovations aimed at expanding the coverage of financial services by promoting microfinance and empowering digital technology-based financial services (Fintech)—with the goal of reaching all segments of society, including those who struggle to access formal financial services (Lee *et al.*, 2023; Wang and Fu, 2022; Ren *et al.*, 2023). The utilization of mobile banking and mobile money in financial transactions can bridge the gap between the poor and the formal financial system. It also plays a crucial role in promoting financial inclusion by providing broader access to credit and savings, while reducing transaction costs. This offers significant benefits to the poor, especially those living in remote areas (Islam *et al.*, 2022; Chen, 2024). The presence of innovative Fintech serves as a solution to reduce poverty by increasing access to digital financial services and mobile phones, specifically targeting communities that previously faced challenges in accessing formal financial services. These financial services include microloans and digital credit access with minimal transaction costs (Nuryitmawan, 2023; Adbi and Natarajan, 2023).

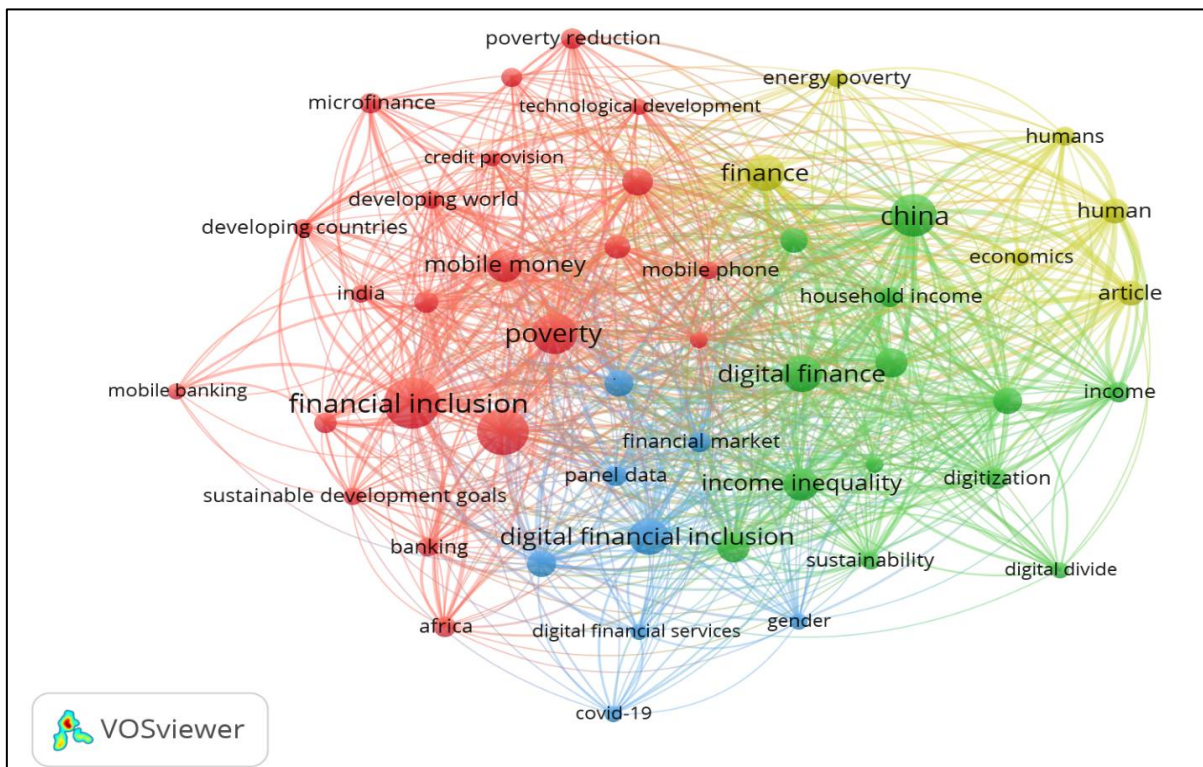
Table 5. Cluster of Co-Word Analysis

Cluster, No, and color	Cluster label	Number of keywords	Representative keywords
1 (red)	Mobile innovation for poverty alleviation	22	Mobile banking; mobile phone; mobile money; microfinance, innovation; poverty; poverty alleviation, financial inclusion; financial technology.
2 (green)	Digital finance and income inequality	13	Digital finance; digital divide; digitization; income inequality; income distribution; sustainable development; household income.
3 (blue)	Integrating digital inclusion into financial systems	8	Digital financial inclusion; digital financial services; financial system; financial services.
4 (yellow)	The economics of finance and the human challenge of poverty	6	Economics; finance; human; humans.

Source (s): Created by authors using VOSviewer and bibliometric metadata

Cluster 2 (green), consisting of 13 items, is titled “*Digital Finance and Income Inequality.*” This cluster highlights the significant role of digital financial inclusion in reducing income distribution gaps by expanding access to inclusive digital financial services, which benefit all segments of society, including low-income communities, vulnerable groups, create economic opportunities for entrepreneurs in the MSME sector, and support populations in underdeveloped regions who previously faced difficulties in accessing formal financial institutions (N’dri and Kakinaka, 2020; Suhrab *et al.*, 2024; Demir *et al.*, 2022; Ozili, 2021). Nevertheless, digital financial inclusion can also have negative implications for reducing income inequality due to factors such as the digital divide, low education levels, and limited digital financial literacy, which may in turn exacerbate financial exclusion and hinder

progress toward sustainable development goals (Anindito and Faturohhman, 2023; Mpofu, 2023).



Source (s): Created by authors using VOSviewer and bibliometric metadata

Figure 4. The network visualization of keyword co-occurrence

Cluster 3 (blue), consisting of 8 items, is titled “*Integrating digital inclusion into financial systems.*” This cluster emphasizes the development of a financial sector that integrates digital inclusion into the national financial system, with a focus on equitable access and the provision of financial services that reach all segments of society. Achieving this requires pro-poverty and pro-inequality reduction policies, empowerment through expanded access and innovation in digital financial services, adequate and evenly distributed digital infrastructure, and improved digital financial literacy (Hasan and Lu, 2023; Mpofu, 2023). Appiah-Otoo and Song (2021) revealed that evaluating development strategies alongside the implementation of inclusive, well-aligned financial policies can improve the complex relationship between financial development, income inequality, and poverty reduction. Furthermore, Nnaomah *et al.* (2024) confirmed that policy strategies should involve strengthening a flexible regulatory framework and designing affordable financial products tailored to people's needs. These elements are essential in promoting inclusive digital financial innovation while ensuring consumer protection and financial stability.

Cluster 4 (yellow), consisting of 6 items, is titled “*The economics of finance and the human challenge of poverty.*” This cluster highlights the human aspect as the key driver in creating economic financial development that is not solely growth-oriented but prioritizes justice, social welfare, and inclusive human development. The main focus of this cluster is on inclusive growth, as well as equitable access to financial services, education, and healthcare as the foundation for addressing poverty.

Taken together, the co-word analysis demonstrates that recent studies have increasingly shifted from discussing financial inclusion as an isolated concept toward a multidimensional perspective that

integrates digital finance, poverty alleviation, income inequality, and sustainable development. The relationships among the four keyword clusters indicate that future research should move beyond examining access to digital financial services alone by considering complementary factors such as digital infrastructure, financial literacy, institutional quality, and social inclusion. These findings highlight several promising directions for future bibliometric and empirical studies.

CONCLUSION

Bibliographic coupling analysis identified four main clusters that illustrate the current research focus: the role of Fintech and digital finance in poverty alleviation and economic transformation; the relationship between digital financial inclusion and socio-economic inequality; the impact of mobile money on gender inclusion and poverty reduction; and the adoption of mobile banking as a pro-poor innovation. Meanwhile, co-word analysis confirmed these themes with four keyword clusters highlighting mobile innovation for poverty alleviation, the role of digital finance in reducing income inequality, the integration of digital inclusion into the financial system, and the economic aspects and humanitarian challenges in addressing poverty. Overall, both bibliometric methods consistently indicate that the existing literature predominantly emphasizes digital financial inclusion as a central research theme related to socio-economic inclusion, poverty alleviation, and income inequality through Fintech innovation.

IMPLICATION, LIMITATION AND RECOMMENDATION FOR FUTURE RESEARCH

Theoretical Implication

This study strengthens the theory of financial inclusion as a tool for economic empowerment, especially in the digital context. The bibliometric findings indicate that the existing literature extensively discusses the potential role of digital financial services in poverty alleviation and income inequality reduction. In addition, these findings encourage the integration of cross-disciplinary concepts such as pro-poor innovation and technology adoption into the inclusive development framework. This study also opens up opportunities for the development of new theoretical models that consider local contexts, digital literacy, and public policies in explaining the role of digital finance in equitable development.

Practical Implications

The results of this research provide an important ground for policymakers and local governments to articulate strategies to enhance digital infrastructure and inclusive financial services in disadvantaged areas. There is a need to unify digital and financial training programs for MSMEs to promote their digital economy participation. In addition, support for the development and dissemination of local Fintech services can reach more people through a strategy that is consistent with local characteristics. These findings provide a knowledge base that may assist policymakers in designing strategies to strengthen digital financial inclusion in support of poverty alleviation and reducing income inequality.

Limitation and Recommendation for Future Research

This study only uses data from the Scopus database with a focus on English-language publications, so the potential for important literature from other sources or other languages may be overlooked. In addition, the bibliometric approach used is quantitative and does not delve deeply into the qualitative context of the digital financial inclusion theme. Therefore, further studies can combine qualitative analysis and expand the scope of the data to obtain a more comprehensive understanding.

Further research is recommended to integrate qualitative approaches to explore contextual factors and social impacts of digital financial inclusion on poverty alleviation and income

inequality reduction. In addition, more specific studies are needed in certain geographic areas or community groups to understand the challenges and opportunities for implementing digital financial services in more depth.

In addition, the exclusive use of the Scopus database and English-language journal articles may introduce geographical and language biases, potentially limiting the representation of relevant studies published in other databases or languages. Consequently, the findings may not fully capture the global landscape of research on digital financial inclusion, poverty, and income inequality. Future studies are encouraged to integrate multiple databases, such as Web of Science and Dimensions, and include publications in other languages to provide a more comprehensive bibliometric mapping.

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