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Department of Economics

Sardar Patel University, Vallabh Vidyanagar

Post Graduate Department of Economics, Sardar Patel University was established in 1958. The Department is the first & the only Department of Economics in the state of Gujarat to have been awarded the status of Centre of Advanced Studies in Economics (CAS – Phase two) in January 2018 by the UGC. Prior to that the Department has been a recipient of SAP (Special Assistance Program) Phase 1, 2, & 3; a generous ASIHSS grant, & CAS (Centre of Advanced Studies) Phase 1. The Department undertakes multidimensional *teaching, research & extension activities*, with one benefitting the other.

In context of *teaching*, Department offers MA, & PhD programs (regular & part-time). Course content & curriculum up-gradation is its regular feature that strikes an appropriate balance between seeking solutions conducive for local economic problems & aspire to be at par with opportunities evolving at national & international level. A strong team of eight faculties include six faculties with a PhD, four being registered PhD guides, four faculties being gold medalists & all faculties have qualified for NET/SLET/JRF. Eminent faculties of the Department have served in various capacities in advisory bodies in State & Central Government, thereby enabling enriched classroom discussions with shared experiences. Department facilitates a learning ecology through hands-on-learning with well-equipped computer lab, electronic peripherals, & enriched library of the Department, AERC, & Bhaikaka library of the University. Learning is enabled through, lectures by eminent guest faculties/practitioners, seminars, assignments, short-documentaries, access to online resources, online blended resources sharing, mock budgets, viva-voce, etc. Besides major economic courses, elective subjects offered include courses sensitive to environment, gender, ethics, & of national & international economic relevance. Department facilitates awards/fellowships to students to motivate their achievements. Students are provided free classes for National & State level competitive exams & are also encouraged for start-ups.

As for the *research*, the department building houses the only Agro-Economic Research Centre, & Cost of Cultivation Scheme in the state of Gujarat, research wings of Ministry of Agriculture & Farmers' Welfare, New Delhi, & the Department has collaborated for more than 140 research projects. Projects have been undertaken for Ministry of Animal Husbandry, Dairying & Fishing, Ministry of Rural Development, National Dairy Development Board, other department of the university, among others to undertake multidisciplinary research. The inception of Artha-Vikas, a national research journal by the Department dates back to 1965 & has published more than 55 volumes including the golden jubilee issue. It is a bi-annual refereed journal with ISSN number 0004-3567 & is also listed in the ABDC list of journals. Since 1958 till date the Department has awarded more than 50 Ph.D. degrees & 50 M.Phil. degrees. Department has published more than 20 working papers, two District Human Development Reports, & more than 100 research projects & village surveys. Department has been continuously involved in organizing seminars, conferences, refresher courses, students' competitions, & memorial lecture series of great economic relevance. Faculties present research papers in national & international seminars & conferences & publish research papers in national & international journals & books.

The Department has been involved in undertaking various *extension activities* related to creating positive impact on raising the productivity of livestock farming, eco-friendly disposal of unused & expired medicines, preparing a statistical outline of the data of Sardar Patel University for two decades, preparing a standard tabulation format for data collection for various universities, charity for old age homes & orphanages, & tree plantation, among others.

However, the Department aspires to ascend knowledge, wisdom, & fulfilment of shared responsibilities by & for the various stakeholders associated with the Department & the larger sections of the society. As we endeavor on this journey, we seek to join hands & collaborate with like-minded & similarly inspired individuals & organizations.

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A BIBLIOMETRIC ANALYSIS OF FINTECH ADOPTION RESEARCH

Akhil Bhatt* & Kamini Shah**

Abstract

Over the past decade, fintech, or financial technology, has attracted considerable interest from academicians, students, and organizations around the world. So much so that extensive research has been conducted on its innovative ways to interact with customers. Using bibliometric analysis, this study investigates the existing trends surrounding research on fintech adoption. Based on article title keywords related to fintech adoption, the study examines a total of 621 publications collected from the Scopus database. Frequency analysis and data visualization were conducted with Microsoft Excel and VOSviewer. The standard bibliometric indicators are used to show the annual publication trend, document types, source types, keywords, and authors. There shows a significant increase in the number of publications compared to 2014, with an apparent accelerated growth since 2019. This growth trend highlights the increasingly crucial role of fintech in the financial sector.

Keywords: Fintech, adoption, bibliometric analysis, VOSviewer

Introduction

Fintech, short for financial technology, is the integration of advanced technologies with existing financial institutions and services (Still & Lähteenmäki, 2019). According to Feyen et al. (2021), fintech can be defined as "digital technologies with the ability to alter the delivery of financial services by the development of new business models and procedures." Jun & Ye (2016) describe fintech as "recent developments in information communication technology that have accelerated the creation and growth of new, modern financial services." Fintech is an expansive term and thus is not easy to categorize since fintech is already very diversifying. However, the sector can be subdivided into areas such as Insurtech, wealthtech, digital payments, cryptocurrency and blockchain and artificial intelligence. (Statista, 2024).

According to Arner et al. (2017), fintech is not a new phenomenon for the financial service industry. The concept of technology in finance dates back to when analogue was used in 1866. Automated Teller Machine (ATM) was one example of Fintech of that age. In 2008, America faced a dire financial crisis and the entire world felt the effect of that. Commercial banks were hit by the decline in functional performance. The traditional financial industry needed fintech to satisfy customer demand, make regulation more effective and create new sources of profits. Across financial market, emerging a diverse array of innovative fintech business models. Numerous scholars have placed much emphasis on the research of fintech business models. (Liu et al., 2020).

Since the last few years, there has been a tremendous increase in the adoption rate of fintech worldwide. The outbreak of COVID-19 has further accelerated it. With the recent developments in Industry Revolution 4.0, many scholars and researchers have been exploring various related topics (Ahmi et al., 2020). As a result, this paper aims to present an overview the current state of fintech adoption research and analyze its emerging trends. Bibliometric analysis allows us to explore and analyse large numbers of methodical data (Donthu et al., 2021). According to Durieux & Gevenois (2010), the indicators of bibliometric analysis are divided into three categories. The first category, known as Quantity indicators, measures the productivity of publications by using the quantity of publications, number of authors etc. The second category, Quality indicators, measures the impact of the researcher's work through citation analysis. The final category, Structural indicators, measures the connection between publication, authors and research area through co-authorship and co-citation. CiteSpace

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and VOSviewer are two visualization tools that can help in conducting bibliometric analysis. However, despite its widespread applications, bibliometric analysis is still underutilized in business research.

The following sections of the paper provide an overview of the literature on bibliometric analysis and outline the methodologies employed in this study. The results derived from the documents compiled in the Scopus database are presented in the subsequent analysis section. Finally, the conclusion section discusses the study's limitations and offers suggestions for future research.

Review of Literature

This section of the paper reviews the previous studies which adopted bibliometric analysis in the field of Fintech. These studies are taken as the base for this research paper.

(Ahmi et al., 2020) conducted a bibliometric analysis to map the landscape of financial technology research. Their study aimed to identify emerging trends in fintech literature. A total of 486 documents were retrieved from the Scopus database for this purpose. The bibliometric indicators utilized in the analysis included authorship patterns, publication years, source types, geographical distribution, language, and keyword analysis.

(Brika, 2022) conducted a bibliometric analysis to explore the trends in digital finance and fintech research. They examined 343 articles from the ScienceDirect Database published between 2006-2020. The analysis was presented through publication metrics, including author productivity, keyword frequency by year, as well as network keywords and author collaborations.

(Garg, et al., 2023) conducted a bibliometric analysis to provide an overview of fintech research. The study analyzed 665 published papers retrieved from the Scopus database. The findings were presented through year-wise publication trends, author and country-specific publication and network, keyword analysis and citation metrics.

(Li & Xu, 2021) conducted a comprehensive bibliometric analysis of 848 fintech publications. The study examined publication types, co-occurrence patterns, and timeline analysis of authors' keywords. Additionally, citation analysis, as well as country-wise and journal-wise publication trends, were also presented.

(Li et al., 2020) examined 2887 documents on the Web of Science database published between 2008 and 2018. Their search terms included "internet finance", "online finance", "electronic finance" and other related terms. The study employed co-word analysis and co-citation analysis to explore thematic patterns and influential references in the field.

(Martínez-Climent et al. 2018) investigated 237 articles on equity crowdfunding and peer-to-peer lending published between 2008-2018 in Web of Science. The study analyzed the number of publications per year, the leading countries of publication, and the most productive journals in the field.

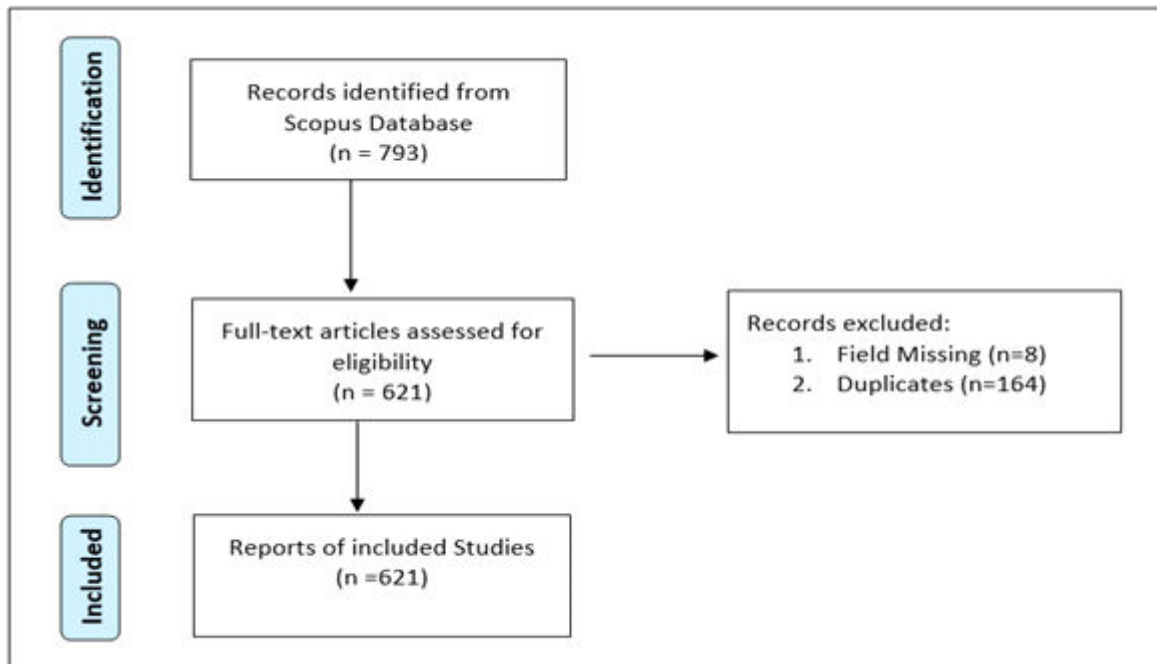
Research Design

For this research, the documents were extracted from Scopus, as of April 2024. We used Publish or Perish software, developed by Harzing, to collect these documents. "Fintech Adoption" OR "Fintech Intention to Use" OR "Fintech Perception" OR "Financial Technology Adoption" OR "Financial Technology Perception" were the keywords used to search related articles. PRISMA analysis was employed to identify and screen the documents for inclusion and finally, 621 research articles were selected for study.

"Prevention and Recovery Information System for Monitoring and Analysis" (PRISMA) helps us to define the screening criteria that are applied, the articles that are excluded, and the process by which research publications are identified. Figure 1 illustrates the PRISMA flow chart. The publications included in the study are shown at the final stage. 793 research publications were identified initially. Out of these, eight publications were

excluded due to missing data in the authors' field. 164 articles were found duplicates and were also removed. As a result, 172 publications were excluded and 621 publications were taken for the analysis.

Figure 1: PRISMA Flow Chart



Source: Compiled by the Authors

Findings of the Study and Discussion

We have obtained 621 documents in total to perform the bibliometric analysis. Several tools were employed to assess the documents. The bibliometric attributes - such as authorship, annual publication trends, and annual growth in the publication were analyzed based on the retrieved data. Descriptive statistics has been used to present the majority of the findings using MS Excel. VOSviewer was used to analyse the authors' keywords and the ten Fintech articles with the highest citations were also presented.

Table 1: Year Wise Publication and Annual Growth

Year	Titles	Increase in No. of Articles	Growth Rate	Percentage	Cumulative Percentage
2014	1			0.16	0.16
2016	3	2	200.00	0.48	0.64
2017	13	10	333.33	2.09	2.74
2018	27	14	107.69	4.35	7.08
2019	46	19	70.37	7.41	14.49
2020	80	34	73.91	12.88	27.37
2021	106	26	32.50	17.07	44.44
2022	133	27	25.47	21.42	65.86
2023	182	49	36.84	29.31	95.17
2024	30	-152	-83.52	4.83	100.00
Grand Total	621			100.00	

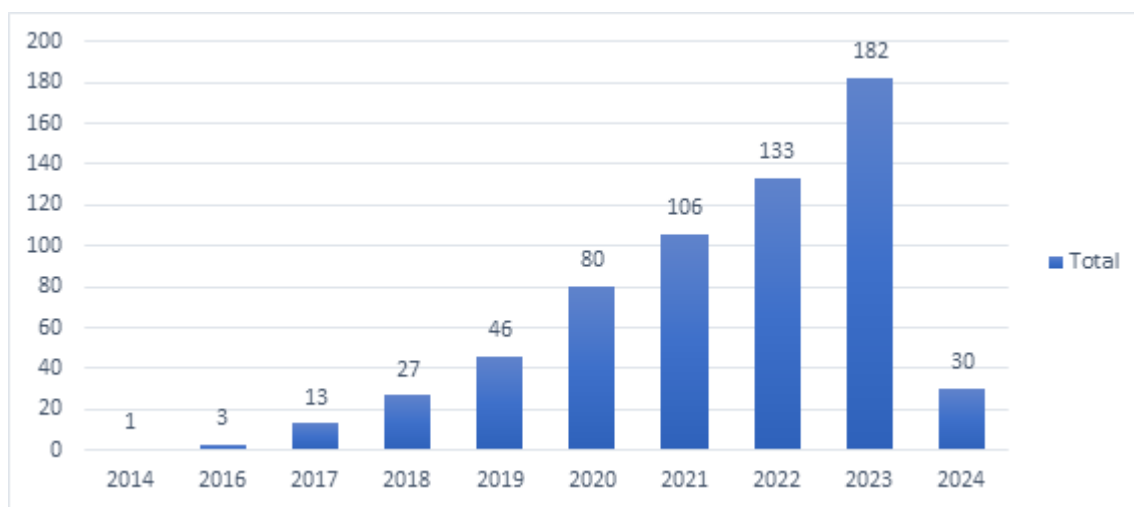
Source: Compiled by the Authors

Annual Growth in Publication

Table 1 shows the year-wise publication of articles, their growth rate, percentage, and cumulative percentage. It suggests that the publications have been increasing significantly over the years. The maximum articles (183) were published in 2023. In the same year, the biggest hike in the number of publications can also be seen with an increase of 49 articles. 2023 also represents the one-third of the total articles published (29.31%). Half of the total articles were published in 2022 and 2023. The highest growth rate was found in 2017 (333.33%).

The steady growth can be seen from 2019, suggesting the effect of the COVID-19 outbreak in popularising the research on fintech adoption. It is anticipated that the number will rise in 2024 as fintech is a highly contested topic that is significantly affecting the financial service sector.

Figure 2: Annual Growth in Publication

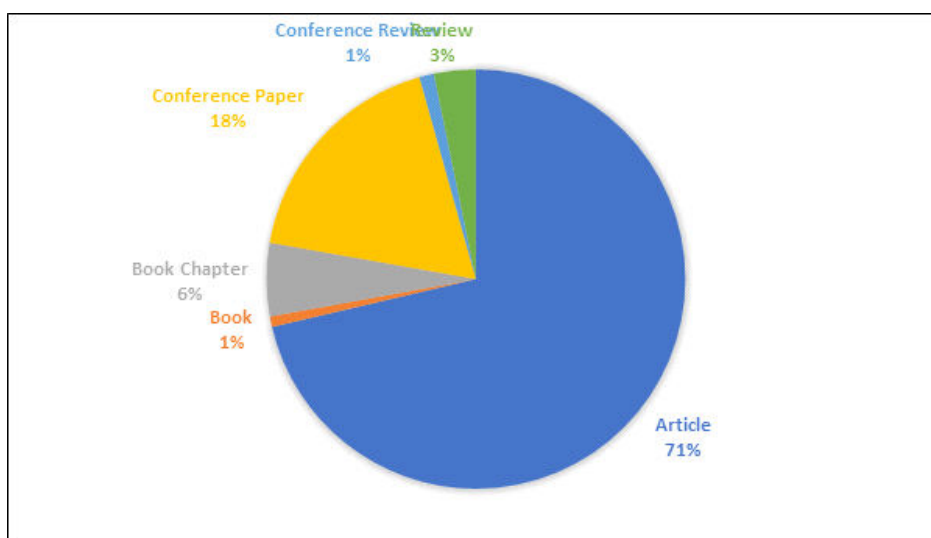


Source: Compiled by the Authors

Document Type of Articles

Figure 3 shows the chart of document types in Fintech adoption research. Journal articles constitute the largest share (71%), followed by Conference papers (18%), Book Chapters (6%) and Reviews (3%).

Figure 3: Document Type of Articles Published



Source: Compiled by the Authors

Analysis of Source

Fintech adoption research has been published in many books, conference papers and journals. Table 2 shows a source analysis of Fintech adoption studies. It lists the sources, number of publications and citations a source has. "Technological Forecasting and Social Change" is the journal with the most citations (948) and 16 publications. However, the journal "Sustainability (Switzerland)" published the highest number of articles (27) with 449 citations. This suggests that these two journals are leading sources of research on Fintech Adoption.

Table 2: Analysis of Source

Sr. No.	Source	Total Publication	Total Citation
1	Technological Forecasting and Social Change	16	948
2	Industrial Management and Data Systems	5	699
3	Sustainability (Switzerland)	27	449
4	Electronic Commerce Research and Applications	5	390
5	Journal of Open Innovation: Technology, Market, and Complexity	7	298
6	Journal of Network and Computer Applications	1	275
7	Symmetry	1	237
8	Journal of Theoretical and Applied Electronic Commerce Research	3	223
9	Technology in Society	3	217
10	International Journal of Bank Marketing	14	176

Source: Compiled by the Authors

Analysis of Keywords

Using WordSift, we created a word cloud for the author's keywords to analyse them. The 100 most frequent words from the published fintech adoption articles are displayed in figure 4. The total number of times the keyword appears is represented by the size of each keyword.

The word cloud displays various emerging words like artificial intelligence, cryptocurrency, and blockchain in addition to the words that were used to search the document titles. Other keywords, despite their relatively smaller size, are trending words in fintech adoption research. These emerging keywords present potential avenues for future fintech research.

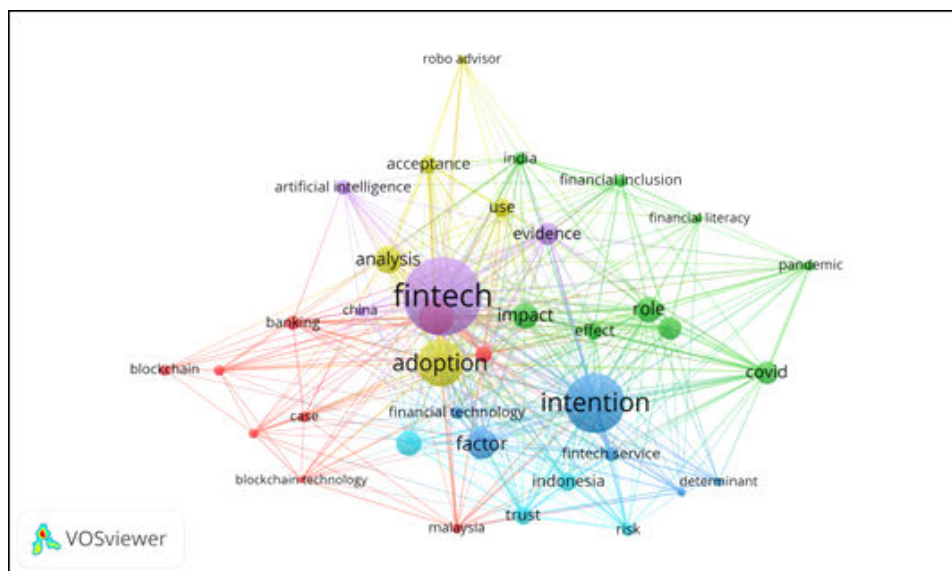
Figure 4: Word Cloud of Author Keywords



Generated by the Authors

Further as illustrated in Figure 5, we have identified six major clusters of Fintech Adoption literature through co-occurrence analysis with author keywords in VOSviewer Software. The minimum criteria set for the occurrence was 10 times. The results indicated that Fintech has the highest total number of appearances (156) and has the most links. The words Adoption, Intention and Perspective appeared 94, 80 and 34 times respectively. The fields of Blockchain, Cryptocurrency, Robo-Advisory and Millenials all require more focus for the study.

Figure 5: Co-occurrence Analysis



Generated by the Authors

Most Cited Documents

Table 3 shows the ten most cited articles from the Scopus database, ranked by the number of times they have been cited. The document titled "Artificial Intelligence in FinTech: understanding robo-advisors adoption among customers" by (Belanche et al., 2019) has obtained the most number of citations 294 with 58.8 citations per year. However, the document titled "Small business awareness and adoption of state-of-the-art technologies in emerging and developing markets, and lessons from the COVID-19 pandemic" by (Akpan, 2022) has been among the most impactful articles with per-year citations of 76.

Table 3: Most Cited Documents

Sr. No.	Total Citation	Author	Title	Year	Citation Per Year
1	294	D. Belanche	"Artificial Intelligence in FinTech: understanding robo-advisors adoption among customers"	2019	58.8
2	282	V. Chang	"How Blockchain can impact financial services – The overview, challenges and recommendations from expert interviewees"	2020	70.5
3	275	K. Gai	"A survey on FinTech"	2018	45.83
4	237	Z. Hu	"Adoption intention of fintech services for bank users: An empirical examination with an extended technology acceptance model"	2019	47.4

5	223	E.Z. Milian	“Fintechs: A literature review and research agenda”	2019	44.6
6	195	H. Albayati	“Accepting financial transactions using blockchain technology and cryptocurrency: A customer perspective approach”	2020	48.75
7	189	H.S. Ryu	“What makes users willing or hesitant to use Fintech?: the moderating effect of user type”	2018	31.5
8	153	W.L. Shiau	“Understanding fintech continuance: perspectives from self-efficacy and ECT-IS theories”	2020	38.25
9	152	I.J. Akpan	“Small business awareness and adoption of state-of-the-art technologies in emerging and developing markets, and lessons from the COVID-19 pandemic”	2022	76
10	152	P.K. Senyo	“Unearthing antecedents to financial inclusion through FinTech innovations”	2020	38

Source: Compiled by the Authors

Most Contributing Authors

The list of the most cited authors is listed in Table 4. A total of 614 authors were identified in the database. Among them, 30 authors had two articles, 9 authors had three articles and C.Li was the only author with four published articles. D. Belanche has been cited for the most 294 times in one document followed by H.S. Ryu cited 293 times in three documents.

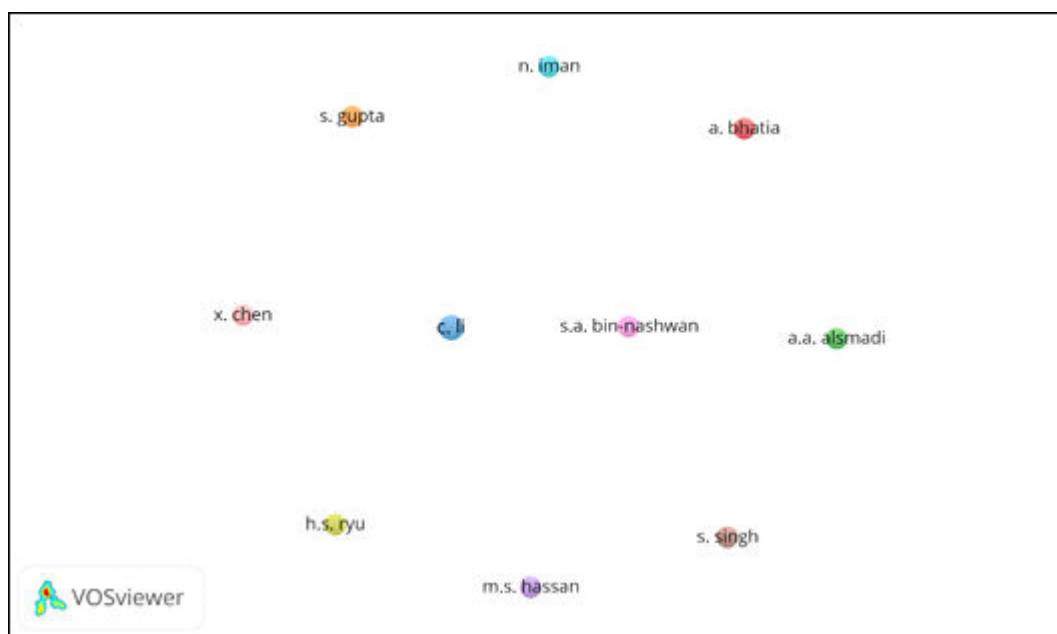
Table 4: Most Contributing Authors

Sr. No.	Author	Total Documents	Total Citation
1	D. Belanche	1	294
2	H.S. Ryu	3	293
3	V. Chang	1	282
4	K. Gai	1	275
5	Z. Hu	2	263
6	E.Z. Milian	1	223
7	H. Albayati	1	195
8	X. Chen	3	168
9	P.K. Senyo	2	165
10	S. Singh	3	156

Source: Compiled by the Authors

Relationship between Co-Authors and Authors

The analysis of the relationship between co-authors and authors, which includes the patterns of researcher collaboration, sheds light on the dynamics within a fintech adoption research community. Figure 6 presents the Co-Author and Author relation. This study established a threshold wherein authors with a minimum of three articles were considered out of a total of 614 authors. The analysis showed six authors who fit this criterion and are active contributors to the research of fintech adoption.

Figure 6: Relationship between Co-Authors and Authors

Generated by the Authors

Conclusion

This study presented a comprehensive review of scholarly publications published in the Scopus database on the subject of fintech adoption. The study used bibliometric indicators to report the trend of research. A total of 621 documents were analyzed and the results revealed that the first study published on fintech adoption was in 2014, indicating the newness of the fintech adoption research. Since 2014, the number of publications has increased steadily with substantial growth observed since 2019. Most of the published articles were Journal articles (71%) and the journal, "Sustainability (Switzerland)", has the highest number of published documents and "Technological Forecasting and Social Change" was the most cited journal. There were a total of 614 authors and the majority of the authors had a single publication. With keywords analysis, the study found the gap in the area of Blockchain, Cryptocurrency and Robo-advisory, that future researchers can explore.

Implication of Research Work

Bibliometric analysis of Fintech adoption provides valuable insights for researchers, policymakers, and industry leaders. By analyzing publication trends, authorship patterns, and highly cited works, the study reveals areas of intense research activity and identifies key themes and under-researched aspects of Fintech adoption. This knowledge can inform future research directions, guide policy decisions to foster a more inclusive and secure Fintech environment and help industry players focus on the most impactful Fintech solutions for broader adoption.

Limitations

Although this paper provides insightful information, it should be noted that there are few restrictions. First, specific keywords were used in the study to find the list of published scholarly works in the Scopus database. Despite Scopus being one of the largest online databases, it may fall short in covering all sources. Therefore, it is reasonable to anticipate some exclusions from this study. Secondly, the study has presented its analysis based on the Scopus database only, future researchers can use different databases like Web of Science or ScienceDirect. Moreover, the word "Fintech" is a newly coined term. Prior research may have concentrated

on financial technology adoption but not referred to as Fintech specifically. Finally, the study has used VOSviewer for the keyword analysis, future researchers can use different software like CiteSpace to obtain different results.

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FACTOR AFFECTING "GUICHET DISTANT" SERVICES ADOPTION IN ALGERIA: EXPLORING THE ROLE OF TRUST AND SOCIABILITY

Abad Benkaddour* & Hamid Kara Achira**

Abstract

E-government initiatives in Algeria are still emerging, and limited empirical evidence exists on the factors shaping citizen adoption. This study investigates Algerian citizens' behavioral intention to adopt Guichet Distant (GD, Remote Administrative Portal) services using a modified Unified Theory of Acceptance and Use of Technology (UTAUT) framework. Data were collected from 213 respondents through a face-to-face survey and analyzed with structural equation modeling. The results show that performance expectancy, facilitating conditions, and trust significantly enhance effort expectancy, which, together with attitude, strongly predicts behavioral intention. Although sociability was hypothesized to negatively affect adoption, its effects were not statistically significant. Moderation analysis revealed that gender, age, and internet experience shape several relationships between the model's constructs and behavioral intention. The study extends UTAUT by incorporating trust and the personality trait of sociability, offering new insights into technology adoption in a developing-country context. Practical implications suggest that policymakers should prioritize simplicity, trust-building mechanisms, and interaction-oriented features in GD platforms to strengthen adoption and sustained use. Limitations and avenues for future research are also discussed.

Keywords: UTAUT; Distant office services; Algerian's e-government; trust; sociability.

JEL CLASSIFICATION : G18, M15, D12.

Introduction

By early 2025, Algeria had achieved nearly 77% internet penetration, supported by over 50 million active mobile connections, providing a strong foundation for digital public services (Kemp, 2025). Despite this infrastructure, global rankings indicate that considerable progress is still required. Algeria was ranked 112th out of 193 countries on the United Nations E-Government Development Index (EGDI) and 148th on the E-Participation Index, reflecting limited citizen engagement and ongoing barriers to digital inclusion (United Nations, 2022). Digital financial adoption also remains modest, with only 16% of adults using online payment systems and fewer than 10% of e-government services fully transactable online (Amrane and Damene, 2023).

Moreover, academic research highlights low usage of mobile e-government services: Abdelkarim and Idoughy (2021) found that 65% of Algerians surveyed had never used such services, indicating that infrastructure alone does not guarantee adoption.

Citizens can access a variety of e-government services, including civil status certificates (birth, marriage, death), family records, national ID and passport applications, tax declarations, business registration, and social security services. Health-related services, such as the Sihatic e-medical card, are operational, and educational portals allow university registration and scholarship applications. Despite these offerings, overall adoption is limited, highlighting challenges in usability, digital literacy, and service integration.

To address these challenges and streamline service delivery, the Guichet Distant (GD), or Remote Administrative Portal, was launched in June 2021 by the Ministry of Interior, Local Collectivities, and Territory

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Planning (MILCTP). Initially, GD enabled the submission of 56 socio-economic administrative documents, representing a significant step toward integrating multiple services into a single, accessible online platform.

This study examines citizens' adoption of GD services using a modified version of the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). While UTAUT has been widely applied to e-government adoption in both developed and developing contexts, prior studies have incorporated constructs such as trust, perceived risk, internet ethics, computer self-efficacy, website quality, and cultural dimensions (Alshehri, 2012; Al-Mansoori, 2017; Zeebaree et al., 2022; Li, 2021).

The present study makes three contributions. First, it adapts e-government adoption models to the Algerian context, responding to calls for context-specific research (Dwivedi et al., 2017; Verkijika & De Wet, 2018). Second, it incorporates sociability, a personality trait, alongside trust as predictors of adoption intention—an approach rarely examined for utilitarian technologies such as GD. Third, it explores interaction effects among UTAUT predictors and evaluates the moderating role of demographic factors.

By integrating these perspectives, the study extends the UTAUT framework and provides new insights into the determinants of e-government adoption in Algeria, a context where both official data and academic research remain scarce.

Literature Review

Research on e-government adoption in developing countries has identified several critical determinants (Rodrigues et al., 2016; Al-Mansoori et al., 2018; Isaac et al., 2019). AlAwadhi and Morris (2008) and Al Imarah et al. (2013) showed that performance expectancy and effort expectancy significantly shape behavioral intentions in university contexts. Similarly, Alshehri et al. (2013) found that all UTAUT constructs influenced Saudi citizens' adoption, except social influence, while internet experience emerged as a significant moderator.

Cultural and contextual factors also play a role. Rabaa'i (2017) reported that in Jordan, social influence on adoption was reinforced by high power distance and low individualism. Lin et al. (2011) demonstrated the strong effect of TAM constructs in Gambia but argued that weak IT infrastructure limits perceived benefits. Rodrigues et al. (2016) emphasized that trust and security are essential for satisfaction with e-government services.

Studies in Tunisia further highlighted contextual adaptations. Chaouali et al. (2016) extended UTAUT with trust, explaining 84.9% of the variance in e-filing adoption, while Nasri (2019) added social influence, awareness, and internet quality to TAM, showing their indirect effects on performance expectancy.

Broader regional studies confirm the need for model refinement. Verkijika and De Wet (2018), applying UMEGA in Sub-Saharan Africa, found performance expectancy, social influence, perceived risk, and computer self-efficacy shaped attitudes, while trust and facilitating conditions directly influenced intention. Rai et al. (2020) applied the same model in Nepal and stressed that adoption depends on senior officials' awareness, commitment, and transparent policymaking.

In sum, while original models such as TAM, UTAUT, and UMEGA provide a foundation, evidence shows that constructs such as trust, culture, awareness, and infrastructure must be incorporated to capture the realities of developing countries.

Given Algeria's cultural context of low individualism (IDV = 29) and high uncertainty avoidance (UAI = 70; Hofstede Insights, 2024), the integration of trust and sociability into the UTAUT model is essential, as these constructs reflect the collective orientation and risk-averse tendencies that significantly shape technology adoption behaviors.

Research Model and Hypothesis

This study adopts the UTAUT model (Venkatesh et al., 2003) with modifications, adding sociability, trust, and attitude toward adopting GD services, examining interactions among exogenous variables, and excluding the social influence construct.

Performance Expectancy

Performance expectancy refers to the belief that using an e-government system such as GD improves efficiency in completing government services (Venkatesh et al., 2012; Verkijika & De Wet, 2018). It encompasses perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations (Venkatesh et al., 2003). Widely regarded as the strongest predictor of technology adoption (Venkatesh, 2003; Rabaa'i, 2017), its effect is not always consistent, as some studies found no significant impact (Krishnaraju et al., 2018). Research also shows that performance expectancy can mediate the link between effort expectancy and behavioral intention (Herrero et al., 2017; Dwivedi et al., 2017). In this study, we propose that it directly enhances effort expectancy, since citizens who recognize a technology's benefits are more likely to use it with less effort. Empirical evidence also confirms its positive association with attitude toward adoption (Dwivedi et al., 2017; Verkijika & De Wet, 2018). Thus:

H1a: Performance expectancy positively affects effort expectancy.

H1b: Performance expectancy positively affects attitude toward GD adoption.

Effort Expectancy

Effort expectancy refers to the perceived ease of using technology (Venkatesh et al., 2012). In this study, it is measured by perceptions of ease of use and ease of learning GD (Rabaa'i, 2017). Prior research generally supports its positive effect on both attitude and intention to adopt e-government services (Alshehri et al., 2013; Dwivedi et al., 2017), although some studies reported no significant relationship (Herrero et al., 2017; Lallmohamed et al., 2017; Verkijika & De Wet, 2018). Thus:

H2a: Effort expectancy positively affects attitude toward GD adoption.

H2b: Effort expectancy positively affects intention to adopt GD.

Facilitating Conditions

Facilitating conditions refer to the perceived availability of organizational and technical infrastructure supporting technology use (Rodrigues et al., 2016; Lin et al., 2011). They are recognized as key determinants of intention and actual usage of e-government services (Venkatesh et al., 2012). Empirical studies generally confirm their positive effect on effort expectancy and behavioral intention (Dwivedi et al., 2017; Verkijika & De Wet, 2018; Mensah et al., 2020), though some report insignificant or negative associations (Sichone et al., 2017; Al-Mansoori et al., 2018). Thus:

H3a: Facilitating conditions positively affects effort expectancy.

H3b: Facilitating conditions positively affects intention to adopt GD.

Trust

Trust is a complex, multidimensional construct (Lewis & Wiegert, 1985; McKnight & Chervany, 2001). In this study, it is defined as citizens' feeling of safety and assurance when adopting e-government services. Trust reduces perceived risk and enhances adoption intentions (Schaupp et al., 2010). Prior research confirms its positive influence on attitude and intention (Belanche et al., 2012; Abu-Shanab, 2014; Al-Saedi et al., 2019), with antecedents such as privacy, security, and trust in government and technology (Abu-Shanab, 2014). Recent

evidence also shows trust strengthens perceptions of usefulness and continued use of digital services (Kilani et al., 2023). Accordingly, citizens who trust the technology are more likely to adopt it with less effort and a favorable attitude. Thus:

H4a: Trust positively affects effort expectancy.

H4b: Trust positively affects attitude toward GD adoption.

Sociability

Sociability is broadly defined as the tendency to seek social interaction and prefer being with others rather than alone (Cheek & Buss, 1981; Junglas et al., 2013). In this study, it is treated as a consumer personality trait, distinguishing between extraverts, who thrive on interaction and activity, and introverts, who prefer solitude or limited social circles (Spake & Megehee, 2010). Although few studies have linked sociability to technology adoption, findings suggest it influences perceptions of enjoyment, social presence, and ultimately behavioral intention (Smith & Sivo, 2011; Junglas et al., 2013). Other research highlights its role within broader personality frameworks, showing extraversion relates to usefulness, ease of use, and intention (Svendsen et al., 2011; Rosen & Kluemper, 2008). Conversely, evidence from ATM adoption studies indicates that highly sociable individuals, particularly the elderly, may resist self-service technologies in favor of personal interaction (Zeithaml & Gilly, 1987; Smither et al., 1991). Building on this perspective, we expect sociability to reduce favorable attitudes toward self-service e-government systems such as GD. Thus:

H5a: Sociability negatively affects attitude toward GD adoption.

H5b: Sociability negatively affects intention to adopt GD.

Attitude

Although Venkatesh et al. (2003) excluded attitude from UTAUT, the construct has been central in prior models linking beliefs and intentions, including TRA (Fishbein & Ajzen, 1975), TAM (Davis et al., 1989), and TPB (Ajzen, 1991). Attitude is defined as an individual's favorable or unfavorable evaluation of a behavior (Ajzen, 1991). Extensions of UTAUT, such as UMEGA (Dwivedi et al., 2017; Verkijika & De Wet, 2018), demonstrated that incorporating attitude and e-government-specific factors (e.g., perceived risk) significantly improved explanatory power. Later evidence confirmed that attitude both mediates the effects of exogenous constructs and directly enhances usage intentions (Dwivedi et al., 2019; Mensah et al., 2020). Accordingly:

H6: Attitude toward adopting GD positively affects intention.

Demographic Variables

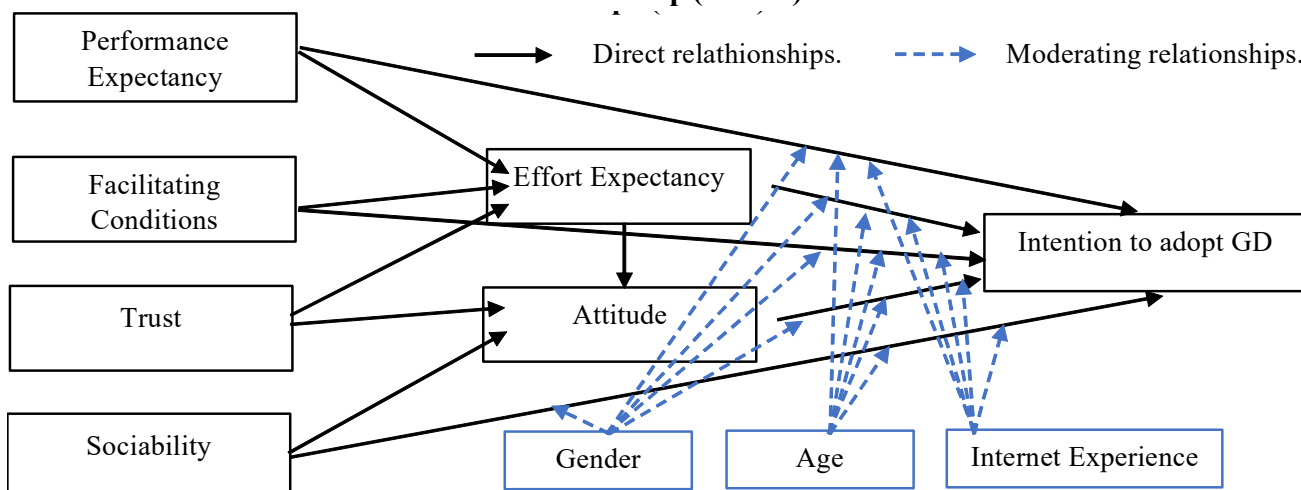
In the original UTAUT model, Venkatesh et al. (2003) identified gender, age, internet experience, and voluntariness of use as key moderators. Performance expectancy influenced behavioral intention more strongly among men and younger users, while effort expectancy was more salient for women, older individuals, and those with less internet experience. Subsequent studies in e-government confirmed these moderating effects but also reported mixed findings. For example, AlAwadhi and Morris (2008) showed that internet experience strengthened the role of performance expectancy but weakened effort expectancy, with no significant gender effects. Rabaa'i (2017) found age and experience negatively moderated the impact of facilitating conditions on behavioral intention, whereas the effect was stronger for females. Similarly, Al Mansoori et al. (2018) reported stronger effort expectancy effects among women and greater reliance on performance expectancy among older users. In developing contexts, Zeebaree et al. (2022) highlighted moderating roles of age, education, and internet ethics in shaping trust, performance expectancy, and behavioral intention. Accordingly:

H7: Gender significantly moderates the relationships between key constructs and behavioral intention to adopt GD.

H8: Age significantly moderates the relationships between key constructs and behavioral intention to adopt GD.

H9: Internet experience significantly moderates the relationships between key constructs and behavioral intention to adopt GD.

Figure 1: Modified UTAUT model for GD adoption showing direct and moderating relationship (H1-H9)



Source: Adapted from Venkatesh et al. (2003, p.447).

Research Methodology

This study examined municipal e-services in Chlef province, Algeria, focusing on the issuance of birth, death, marriage, residence and family civil status certificates. A structured questionnaire was adapted from prior studies: performance expectancy, effort expectancy, facilitating conditions, and behavioral intention (Venkatesh et al., 2003; Dwivedi et al., 2017; Verkijika & De Wet, 2018); trust and attitude (Dwivedi et al., 2017; Mensah et al., 2020); and sociability (Spake & Megehee, 2010; Agyei et al., 2020). All items used a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

A pilot test with 33 respondents ensured clarity and contextual appropriateness, leading to minor wording refinements. Data collection yielded 219 responses from 226 distributed questionnaires; six inconsistent cases were removed, resulting in 213 valid observations. Following Hair et al. (2018), who recommend 15-20 observations per variable, the final sample was considered adequate for testing the seven-construct model.

Results and Discussion

Appendix A presents the sample demographics: 79.8% male, 80.3% under 41 years, 42.3% employed, and 21.6% self-employed. Over half (53%) had more than five years of internet experience, while only 8% had less than one year. Most respondents (76.1%) were aware of the GD services.

Structural equation modeling (SEM) was used to test the hypotheses. Following criteria for loadings (<0.5), modification indices (>10), and residuals (>3), five items (PE1, PE2, EE3, FC2, BI3) were removed. Construct validity was assessed through factor loadings (>0.7 except six items), composite reliability (>0.7 except BI), and AVE (>0.5). Results (Table 2) showed acceptable convergent validity and reliability (Cronbach's α > 0.6), consistent with challenges in UTAUT reliability in developing contexts (Im et al., 2011; Prodromos et al., 2015).

Discriminant validity was confirmed using Fornell and Larcker's (1981) criterion: the square root of AVE exceeded inter-construct correlations (Table 2), indicating satisfactory discriminant validity.

Table 1: Measurement model results - Construct reliability and convergent validity.

Constructs		Items	Loadings	AVE	Composite Reliability	Cronbach's Alpha	
Performance Expectancy (PE)		PE3	0.752	0.557	0.715	0.700	
		PE4	0.736				
Effort Expectancy (EE)		EE1	0.758	0.566	0.795	0.787	
		EE2	0.842				
		EE4	0.648				
Facilitating Condition (FC)		FC1	0.699	0.658	0.767	0.630	
		FC3	0.651				
Trust (TR)		TR1	0.657	0.518	0.761	0.760	
		TR2	0.668				
		TR3	0.824				
Sociability (SO)		SO1	0.654	0.557	0.788	0.777	
		SO2	0.851				
		SO3	0.719				
Attitude (ATT)		AT1	0.859	0.698	0.864	0.873	
		AT2	0.784				
		AT3	0.860				
Intention to adopt (BI)	GD	BI1	0.839	0.538	0.673	0.685	
		BI2	0.609				
$\chi^2 = 248.279$ (df = 114), $SRMR = 0.072$, $CFI = 0.91$, $RMSEA = 0.072$.							
	PE	EE	FC	TR	SO	AT	BI
PE	0.745						
EE	0.709	0.752					
FC	0.301	0.321	0.765				
TR	0.278	0.248	-0.297	0.720			
SO	0.161	0.090	0.163	0.104	0.746		
AT	0.313	0.383	-0.175	0.707	0.008	0.835	
BI	0.424	0.521	0.066	0.414	-0.052	0.537	0.735

Source: Extracts from AMOS 24 Output.

The exogenous variables in the model explain 38% of the variance in attitude toward technology adoption, while all factors together account for 20% of the variability in behavioral intention. Because the model was originally developed for technology adoption in developed economies, its explanatory power is expected to decline in developing contexts (Sichone et al., 2017). For instance, Sichone et al. (2017) found that all factors explained only 18.8% of the variation in Tanzanians' intention to adopt e-filing.

Statistical analysis related to H1a revealed a significant effect ($\beta=0.628$, $p<.001$), indicating that individuals are more willing to learn how to use a technology when they perceive it as advantageous in their daily lives. However, the effect of performance expectancy on attitude (H1b) was not significant ($\beta=0.037$, $p=.717$). This result diverges from Sang and Sally (2021), who reported a positive and significant effect in the e-commerce context, and Robinson (2015), who found a similar effect for e-learning adoption. Conversely, Rahmiati (2019) also confirmed the absence of a relationship, suggesting that context strongly influences this factor.

Trust demonstrated the strongest influence among all predictors. It had a positive and significant effect on both effort expectancy ($\beta=0.123$, $p<.05$) and attitude toward using GD ($\beta=0.596$, $p<.001$), supporting H4a and H4b. These findings align with numerous studies emphasizing the central role of trust in technology adoption across e-government (Chaouali et al., 2016; Alharbi et al., 2016; Al Mansouri, 2018) and other domains (Pavlou & Fygenson, 2006; Rahmiati, 2019). For instance, Lee and Song (2010) found that trust positively impacted

effort expectancy in Korea's Certified e-Document Authority service, while Alharbi et al. (2016) ranked trust as the third most important factor influencing intention in Saudi Arabia's e-government. Trust is particularly critical for relatively new technologies such as GD, launched only two years ago. Accordingly, governments must establish trustworthy relationships with citizens, businesses, and agencies before rolling out large-scale e-government systems (Abu-Shanab, 2014). This is especially urgent in Algeria, which ranked 100th out of 131 countries in the 2022 Networked Readiness Index and 114th on the trust sub-indicator. Public campaigns to strengthen citizen confidence are therefore essential.

Facilitating conditions had a significant positive effect on effort expectancy ($\beta=0.204$, $p<.05$) but no significant impact on attitude toward using GD ($\beta=0.033$, $p>.05$). This suggests that infrastructural support, such as training programs, can reduce perceived complexity, even if such support does not directly shape attitudes (Dwivedi et al., 2017).

Sociability negatively influenced both attitude ($\beta=-0.083$, $p>.05$) and intention to adopt GD ($\beta=-0.027$, $p>.05$), but the effects were not significant. This result was expected given the utilitarian nature of GD. Individuals with high sociability are more likely to adopt technologies that enable interaction, such as social networking sites (Junglas et al., 2013; Rosen & Kluemper, 2008). For instance, Wakefield et al. (2011) found that perceptions of website socialness strongly influenced behavioral intention in e-commerce. These insights highlight the importance of integrating human-like or social components into e-government services to better appeal to highly sociable individuals.

Effort expectancy had significant positive effects on both attitude ($\beta=0.285$, $p<.05$) and intention to use GD ($\beta=0.159$, $p<.05$). These findings are consistent with prior studies showing that effort expectancy shapes citizens' attitudes and intentions in e-government contexts (Hammad et al., 2019; Al-Hujran et al., 2015; Rabaa'i, 2017; Zeebaree et al., 2022).

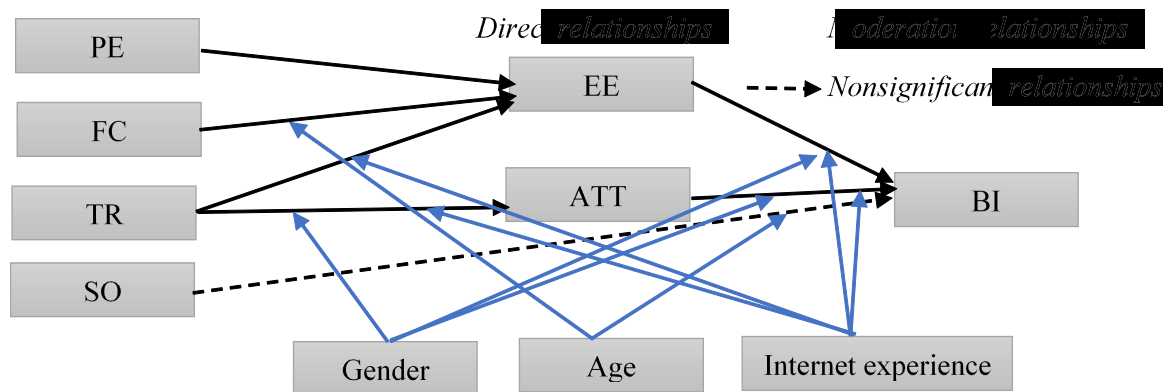
As expected, attitude had a significant positive effect on behavioral intention to use GD ($\beta=0.133$, $p<.05$), supporting H6. This confirms earlier studies identifying attitude as a central determinant of intention to adopt e-government services (Al-Hujran et al., 2015; Dwivedi et al., 2019; Selim & El-Kassrawy, 2021). For example, Dwivedi et al. (2017) found through meta-analysis that attitude plays a key role in explaining behavioral intentions.

Table 2: Path coefficients, significance Levels, and hypotheses testing results for GD adoption model.

Relationship	β	t – value	p – value	Conclusion
FC $\longrightarrow$ EE	0.204	2.185	0.029	H3a supported
FC $\longrightarrow$ BI	0.033	0.546	0.585	H3b not suppo
EE $\longrightarrow$ AT	0.285	4.193	0.000	H2a supported
EE $\longrightarrow$ BI	0.159	3.939	0.000	H2b supported
PE $\longrightarrow$ EE	0.628	8.083	0.000	H1a supported
PE $\longrightarrow$ ATT	0.037	0.363	0.717	H1b not suppo
TR $\longrightarrow$ EE	0.123	2.297	0.022	H4a supported
TR $\longrightarrow$ ATT	0.596	9.483	0.000	H4b supported
SO $\longrightarrow$ ATT	-0.083	-1.115	0.265	H5a not suppo
SO $\longrightarrow$ BI	-0.027	-0.632	0.528	H5b not suppo
ATT $\longrightarrow$ BI	0.133	4.133	0.000	H6 supported

Source: Extracts from AMOS 24 Output.

Figure 2: Final structural model of GD service adoption.



Source: Extracts from AMOS 24 Output.

Moderating Effect Results

To conduct the moderation analysis, we used Amos 24 to compare path coefficients across demographic groups, and then applied the plugin proposed by Gaskin (2021) to test the significance of group differences. The results are presented in Table 5 (Appendix).

The findings reveal several significant gender-based moderation effects. Trust had a significantly stronger influence on attitude for females compared to males ($z=2.73$, $p<.01$). In contrast, effort expectancy ($z=-2.22$, $p<.05$) and attitude ($z=-2.14$, $p<.05$) had a significantly stronger impact on behavioral intention to use GD for males. A marginal difference was also observed for the effect of effort expectancy on attitude, with a stronger impact among males than females ($z=-1.73$, $p<.10$). These results suggest that while females rely primarily on trust to shape their attitudes toward GD, males are more driven by effort expectancy and overall attitude when forming behavioral intentions. Research shows women rely more on institutional trust when adopting online services (Pavlou, 2003; Gefen et al., 2008; Awad & Ragowsky, 2008). In low-trust contexts like Algeria, this reliance is amplified by lower digital literacy, social barriers, and higher risk sensitivity, making trust cues critical for women's adoption of GD. This finding is inconsistent with Venkatesh et al. (2003) and Al Mansoori et al. (2018), who reported that the effect of effort expectancy on behavioral intention was stronger among women than men.

Age also played a moderating role. Facilitating conditions had a significantly stronger effect on effort expectancy among older respondents compared to younger ones ($z=2.37$, $p<.05$). In addition, sociability exerted a significantly stronger influence on behavioral intention among older users ($z=3.81$, $p<.01$). The results further suggest that younger, more sociable individuals were less likely to use GD ($\beta=-0.065$, $p<.05$). These findings are consistent with Al Mansoori et al. (2018), who found that age moderated the relationship between facilitating conditions and behavioral intention. By contrast, Afonso et al. (2012) reported no significant moderation effect of gender across key UTAUT constructs, except for the path from performance expectancy to behavioral intention.

Finally, internet experience moderated several key relationships. The link between trust and effort expectancy was significantly stronger among more experienced respondents ($z=-2.18$, $p<.05$). Conversely, among respondents with low internet experience, the relationship between trust and attitude was significantly stronger ($z=-3.27$, $p<.01$). For less experienced users, the effects of effort expectancy and attitude on behavioral intention were also stronger, though only marginally significant ($z=-1.87$, $p<.10$; $z=-1.85$, $p<.10$). Furthermore, for this group, sociability had a significantly negative effect on behavioral intention ($\beta=-0.092$, $p<.05$). Overall, these results suggest that individuals with lower levels of internet experience tend to rely more heavily on trust

and effort expectancy when forming their behavioral intentions to adopt GD.

Table 3 present the hypotheses testing results based on moderation analysis.

Table 3: Summary of Hypotheses testing and Moderation effects on Behavioral intention to adopt GD services.

The moderator	Stronger effect observed	Decision
Gender	EE -----> ATT (*) TR ----> ATT (***) EE -----> BI (**) ATT ----> BI (**)	H7 partially supported
Age	FC-----> EE (**) SO-----> BI (***)	H8 partially supported
Internet experience	TR -----> EE (**) TR -----> ATT (***) EE -----> BI (*) ATT-----> BI (*)	H9 partially supported

Notes: *** $p - value < 0.01$; ** $p - value < 0.05$; * $p - value < 0.10$

Source: Extracts from AMOS 24 Output.

Conclusion and Limitations

This study examined the determinants of Algerian citizens' behavioral intention to adopt Guichet Distant (GD) services by extending the UTAUT framework with trust, sociability, and attitude. The results show that effort expectancy and attitude are the strongest drivers of intention, while performance expectancy, facilitating conditions, and trust significantly shape attitudes toward adoption. Although sociability did not emerge as a direct predictor, it remains relevant for policy and design, as interaction-oriented features may enhance both user engagement and trust. By embedding simplicity, interactivity, and trust-building mechanisms, policymakers can accelerate the diffusion and sustained use of GD services in Algeria.

Despite these contributions, the study is not without limitations. Social influence was deliberately omitted from the model to avoid overlap with sociability, which may have reduced explanatory power. In addition, the analysis focused only on one personality trait-sociability-while other traits such as agreeableness, conscientiousness, and openness may also influence adoption behavior. Trust was treated as a single-dimensional construct, despite its recognized multifaceted nature. Finally, the relatively small sample drawn from a single province constrains the generalizability of the findings.

These limitations suggest several avenues for future research. Scholars could reintroduce social influence, integrate a broader set of personality traits, and adopt multidimensional measures of trust. Comparative and longitudinal studies would also help capture cultural variations and track evolving adoption behaviors as GD platforms expand and incorporate more interactive features.

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1. Appendices:

Table 4: Demographic characteristics of the sample.

characteristics		Frequency	Percentage (%)
Gender	Male	170	79.8
	Female	43	20.2
Age	18-30	81	38
	31-40	90	42.3
	41 years and older	42	19.7
Position	Employee	90	42.3
	Unemployed	23	10.8
	Self-employed	46	21.6
	In education stage	34	16
	retired	20	9.4
Internet experience	Under one year	17	8
	1-4 years	83	39
	5-9 years	81	38
	More than 9 years	32	15
Guichet distant awareness	Yes	162	76.1
	No	48	22.5
	Without answer	3	1.4

Source: Extracts from SPSS 25 Output.

Table 4: Moderating effects of gender, age, and internet experience on the structural model relationships.

Relationship	Group Comparison	Estimate 1 (β)	p	Estimate 2 (β)	p	z-score
EE ← PE	Male vs. Female	0.615	.000	0.358	.088	-1.146
EE ← FC	Male vs. Female	0.283	.001	0.156	.525	-0.487
EE ← TR	Male vs. Female	0.175	.002	0.076	.559	-0.705
ATT ← EE	Male vs. Female	0.359	.000	0.053	.741	-1.732*
ATT ← SO	Male vs. Female	-0.061	.427	-0.088	.642	-0.132
ATT ← TR	Male vs. Female	0.487	.000	0.912	.000	2.730***
BI ← EE	Male vs. Female	0.128	.000	-0.010	.832	-2.216**
BI ← ATT	Male vs. Female	0.144	.000	0.053	.095	-2.143**
BI ← PE	Male vs. Female	0.001	.990	0.061	.380	0.739
BI ← SO	Male vs. Female	-0.036	.256	0.018	.745	0.846
BI ← FC	Male vs. Female	-0.021	.619	0.002	.984	0.253
EE ← PE	Young vs. Old	0.606	.000	0.359	.007	-1.562
EE ← FC	Young vs. Old	0.232	.011	0.794	.000	2.368**
EE ← TR	Young vs. Old	0.152	.011	0.131	.183	-0.187
ATT ← EE	Young vs. Old	0.305	.000	0.171	.454	-0.561
ATT ← SO	Young vs. Old	-0.054	.469	-0.179	.433	-0.520
ATT ← TR	Young vs. Old	0.622	.000	0.506	.005	-0.610
BI ← EE	Young vs. Old	0.130	.000	-0.002	.985	-1.494
BI ← ATT	Young vs. Old	0.116	.000	0.100	.016	-0.323
BI ← PE	Young vs. Old	0.025	.547	-0.070	.355	-1.100
BI ← SO	Young vs. Old	-0.065	.032	0.216	.001	3.805***
BI ← FC	Young vs. Old	-0.011	.786	-0.142	.282	-0.953
EE ← PE	Low vs. High Internet Exp.	0.464	.000	0.644	.000	1.208
EE ← FC	Low vs. High Internet Exp.	0.279	.030	0.240	.021	-0.234
EE ← TR	Low vs. High Internet Exp.	0.265	.000	0.040	.546	-2.183**
ATT ← EE	Low vs. High Internet Exp.	0.148	.112	0.315	.002	1.225
ATT ← SO	Low vs. High Internet Exp.	-0.110	.301	-0.034	.732	0.525
ATT ← TR	Low vs. High Internet Exp.	0.808	.000	0.415	.000	-3.270***
BI ← EE	Low vs. High Internet Exp.	0.163	.000	0.047	.303	-1.872*
BI ← ATT	Low vs. High Internet Exp.	0.152	.000	0.072	.019	-1.849*
BI ← PE	Low vs. High Internet Exp.	0.037	.494	0.011	.827	-0.357
BI ← SO	Low vs. High Internet Exp.	-0.092	.039	-0.008	.810	1.468
BI ← FC	Low vs. High Internet Exp.	0.011	.844	-0.007	.894	-0.235

Significance levels: *** $p < .01$, ** $p < .05$, * $p < .10$.

Source: Extracts from AMOS 24 Output.

A BIBLIOMETRIC ANALYSIS OF GREEN BANKING: CURRENT STATE, DEVELOPMENT AND PROSPECTS

Savita Saini*

Abstract

The expanding global efforts to battle climate change and preserve the environment have brought green banking to the attention of scholars recently. This paper provides an overview of recent research on green banking as well as recommendations for future research. Using bibliometric analysis, it provides an overview of the state of green banking now and its future prospects. The papers are compiled using the PRISMA framework, and VOS viewer programme with the SCOPUS database is utilised to do this bibliometric analysis. All together 129 papers were written by 334 authors. Using co-citation analysis, four clusters were found, demonstrating that research on green banking has been done in regards to sustainability, CSR (Corporate Social Responsibility), banking system practices along with economic development.

Keywords: green banking, bibliometric, PRISMA, sustainability.

Introduction

Green banking is actually known as sustainable banking, that works to bring long-term economical development by preventing environmental harm to the planet (Islam, Roy, Miah, & Das, 2020). We need to take some concrete steps to preserve and improve the environment. These steps should be business-related, with a suitable centre that emphasises environmental considerations and corporate-level greening activities (Islam, 2020).

The UN Sustainable Development Agenda's seventh goal, "Affordable and Clean Energy," highlights international collaboration to provide access to contemporary, reasonably priced, effective, and renewable energy sources. Goal No. 13, climate change, is caused by industrial processes, land use, and the use of fossil fuels. These factors are linked to extreme weather, storms, droughts, and flooding. This shift has the potential to impede advancement in numerous facets of human life, impacting the well-being and lives of billions of individuals around the globe. Green Banking has contributed significantly towards both these goals. (Mir & Bhatt, 2022).

A recent concept, "green banking" aims to transform the financial sector and provide new, sustainable business models by fusing environmental management with banking operations (Yadav & Pathak, 2013). Mumtaz and Smith's (2019) analysis of the green financing process for sustainable growth in Pakistan discovered the broad prospects of green finance, which not merely helps to reduce environmental issues but also enhances the accountability and competitiveness of enterprises by lowering their carbon emissions.

This study utilises bibliometric analysis pertaining to green banking. The usage of bibliometric research in business area has increased noticeably at present (Donthu et al., 2020, Donthu, Kumar, Pattnaik, & Lim, 2021, Khan et al., 2021). This increased attention may be credited mainly to the easy availability of developed and accessible bibliometric tools, such as Gephi, Leximancer, and VOS viewer, and databases, such as SCOPUS and Web of Science and also the expansion of the bibliometric methods from information science into business research has further strengthened their relevance and use.

Bibliometric analysis helps the research scholars in picking up the highly significant research studies in the area, the eminent scholars in the area, the fundamental researchers in the area, including research institutes and countries in the area of study (Brika, et al., 2021).

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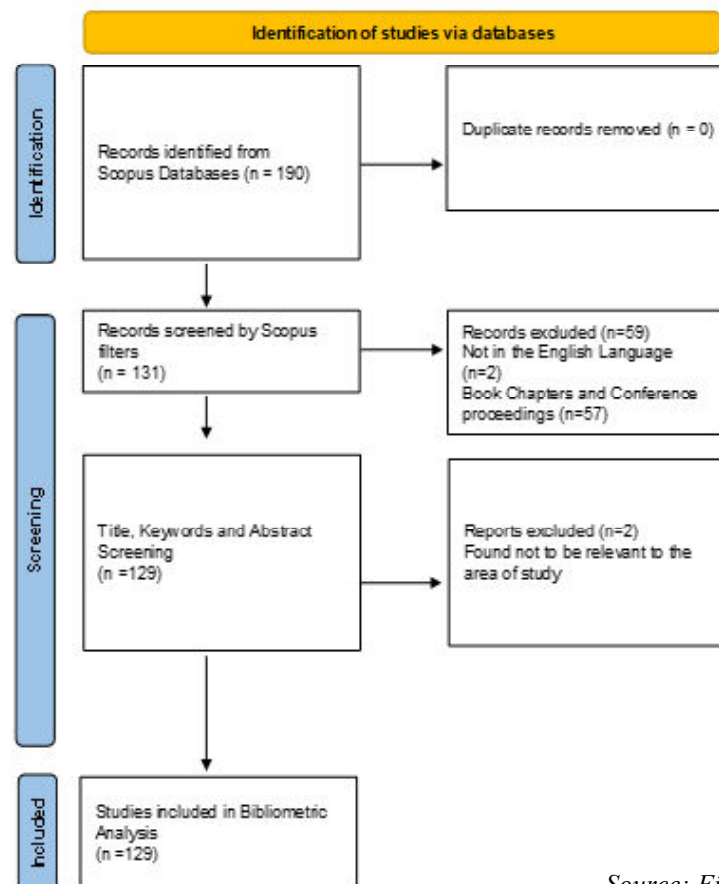
This study used the SCOPUS databases for the analysis; any materials pertaining to green banking published between 2014 and 2023 were taken in. By means of the VOS viewer programme, the data was examined through the following criteria: keywords, authors, references (scholarly articles), research works and countries.

Methodology

The two main methods used in bibliometric analyses to study a specific technical topic using bibliographical data are performance analysis and science mapping (Cobo et al., 2011, Van Raan, 2005). These are usually employed to measure the advancement of a particular scientific field (Liao et al., 2018). Therefore, the bibliometric analyses allow researchers to go further into a certain area of study by providing an effective tool to assess the citations, geographic dissemination, word occurrence, and co-citations. The PRISMA framework is used in this study to determine which papers need to be analysed. To guarantee accuracy and transparency in reporting, the proposed framework (Figure 1) was accepted (Welch et al., 2012).

Prior to this systematic review, a keyword exploration of the literature was done in the Scopus dataset in order to eliminate any likely researcher bias. The keywords utilised were TITLE-ABS-KEY, "Green Banking," and "Green Banking." This search simply searched the abstract, title, and keywords of the article for the term. There were 190 documents in the initial selection. The materials that were selected did not contain book chapters or articles written in languages other than English language. The ultimate set of data for analysis consisted of publications in peer-reviewed journals. To be certain there were no potential differences, a thorough review of all of the initial search's results was made. In the course of manual screening, papers that were believed to be unconnected to the field of green banking were excluded. As Green banking is a recent phenomenon, studies from 2014 until December, 2023 are included.

Figure 1: PRISMA Framework 2020



Source: Figure created by author

Please see Figure 1 for the selection process. The 129 articles that were selected were then subjected to bibliometric analysis. Van Eck and Waltman's (2010) VOSviewer tool was used to assess publication dissemination by country, organisation, journal, networks leveraging from co-occurrence and individual author.

Analysis and Results

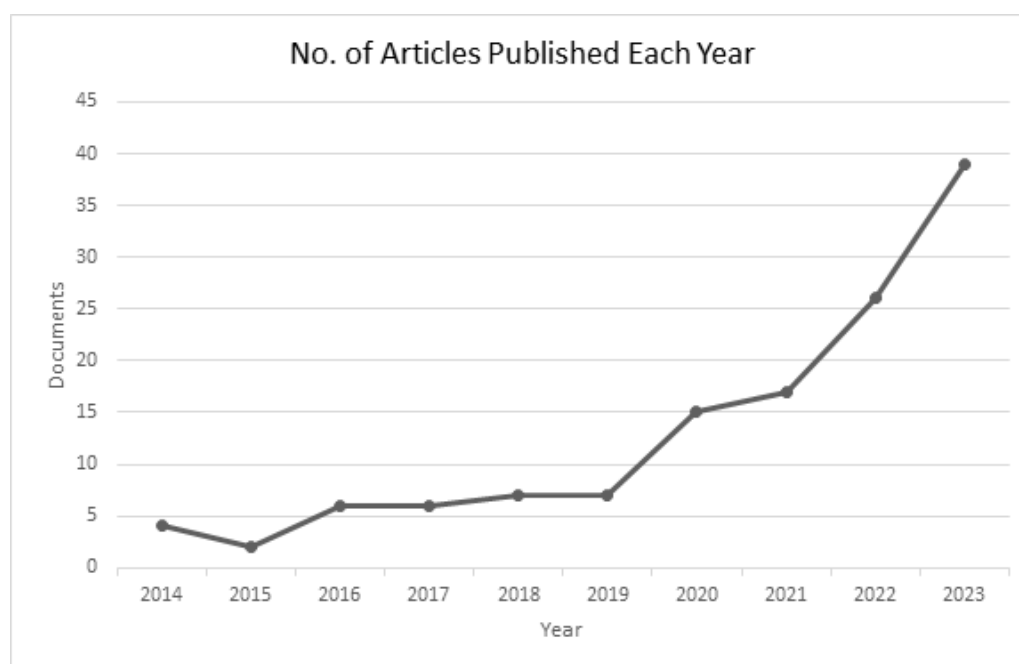
The publishing trend in Figure 2 demonstrates the progression of the yearly number of research articles in the area of green banking. Overall study patterns seem to be heading upward, particularly in 2020 when the COVID19 epidemic severely affected economies, causing them to recognise the importance of green banking which dropped their attention on the subject of research. A total of only 4 papers were published in the year 2014 which rose 39 in the year 2023 (Table 1). This inclination makes it evident that researchers are increasing their interest in this area of research.

Table 1: No. of Articles Published Each Year

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
No. of Articles	4	2	6	6	7	7	15	17	26	39

Source: Table Created by author

Figure 2: Number of Articles Published Each Year



Source: Figure created by author

Major Authors

Major authors in the topic of Green Banking are shown in the Table 2. The maximum number 11 articles with 108 citations have been written by Bukhari, S.A.A. and Hasham, F. and 10 articles with total 80 citations by Amran, A. They collaborated on green banking as a means of achieving the 2030 UN Sustainable Development Goals, as well as on the implementation of green banking and moderating effect of managerial commitment in this regard. Amran, A., Iqbal, M., Nisha, N. majorly worked on green banking implementation in Bangladesh. Rifat, A., Aslam, W., Jawaid, S.T., Julia, T., and Kassim, S. are also prominent researchers in the area of green banking.

Table 2: Key Authors as per the Maximum Number of Citations

Key Authors	Citations	No. of Articles
Bukhari, S.A.A.	108	11
Hashim, F.	108	11
Amran, A.	80	10
Iqbal, M.	51	8
Nisha, N.	55	8
Rifat, A.	51	8
Aslam, W.	27	4
Jawaid, S.T.	27	4
Julia, T.	80	4
Kassim, S.	80	4

Source: Table Created by author

Major Articles

Top articles with maximum no. of citations in the subject of green banking are exhibited in Table 3. Article titled "what drives green banking disclosure? An institutional and corporate governance perspective" is cited maximum no. of time with total of 110 citations followed by the research done by Rubel M.R.B.; Kee D.M.H.; Rimi N.N. on "The influence of green HRM practices on green service behaviors: the mediating effect of green knowledge sharing" with 96 Citations.

Table 3: Major articles on green banking

References	No. of Citation	Title
Bose S.; Khan H.Z.; Rashid A.; Islam S. (2018)	110	"What drives green banking disclosure? An institutional and corporate governance perspective"
Rubel M.R.B.; Kee D.M.H.; Rimi N.N. (2020)	96	"The influence of green HRM practices on green service behaviors: the mediating effect of green knowledge sharing"
Sun H.; Rabbani M.R.; Ahmad N.; Sial M.S.; Guping C.; Zia-Ud-din M.; Fu Q. (2020)	94	"Csr, co-creation and green consumer loyalty: Are green banking initiatives important? A moderated mediation approach from an emerging economy"
Sharma M.; Choubey A. (2022)	66	"Green banking initiatives: a qualitative study on Indian banking sector"
Rehman A.; Ullah I.; Afridi F.-E.-A.; Ullah Z.; Zeeshan M.; Hussain A.; Rahman H.U. (2021)	56	"Adoption of green banking practices and environmental performance in Pakistan: a demonstration of structural equation modelling"
Chen Z.; Mirza N.; Huang L.; Umar M. (2022)	55	"Green Banking —Can Financial Institutions support green recovery?"
Hang N.P.T.(2022)	53	Policy Implications for the Green Bank Development in the Context of Global Climate Change"
Zhixia C.; Hossen M.M.; Muzafary S.S.; Begum M. (2018)	52	"Green banking for environmental sustainability-present status and future agenda: Experience from Bangladesh"
Zhang X.; Wang Z.; Zhong X.; Yang S.; Siddik A.B.(2022)	50	"Do Green Banking Activities Improve the Banks' Environmental Performance? The Mediating Effect of Green Financing"

Source: Table Created by author

Major Journals

Sustainability (Switzerland) is the highly cited (344) journal in the area of green banking with 9 articles followed by Environment, development and sustainability with 222 total citations and 8 articles. For publishing in the field of green banking with maximum impact, the journal enumerated in the Table 4 can be taken into consideration.

Table 4: Key Journals Publishing in the area

Journals	No. of Articles	Citations
“Sustainability (Switzerland)”	9	344
“Environment, Development and Sustainability”	8	222
“International Journal of Green Economics”	6	34
“International Journal of ethics and Systems”	4	66
“International Journal of Asian Business and Information Management”	3	39
“Journal of Islamic Marketing”	3	93
“Emerging Science Journal”	2	54
“Journal of Sustainable finance and Investment”	2	50

Source: Table Created by author

Major Institutions

"Department of Accounting and Information System, University of Barisal, Bangladesh", "Discipline of Accounting and Finance, Newcastle Business School, University of Newcastle, Australia", "School of Commerce, University of Southern Queensland and School of Information System and Accounting, university of Canberra, Australia" are the major intuitions that have published in the field of green banking. "Graduate School of Business, Universiti Sains Malaysia, Malaysia", "Department of Management, Bangladesh University of Professionals, Bangladesh", "Department of Management, Dhaka University, Bangladesh", and "School of Management, Universiti Sains Malaysia, Malaysia" have also worked conspicuously in the area of study.

Table 5: Major institutions

Organizations	No. of Articles	Citations
“Department of Accounting and Information System, University of Barisal, Bangladesh”	1	110
“Discipline of Accounting and Finance, Newcastle Business School, University of Newcastle, Australia”	1	110
“School of Commerce, University of Southern Queensland”	1	110
“School of Information System and Accounting, university of Canberra, Australia”	1	110
“Graduate School of Business, Universiti Sains Malaysia, Malaysia”	4	97
“Department of Management, Bangladesh University of Professionals, Bangladesh”	1	96
“Department of Management, Dhaka University, Bangladesh”	1	96
“School of Management, Universiti Sains Malaysia, Malaysia”	1	96

Source: Table Created by author

Major Countries

Bangladesh, Malaysia, China, India, Pakistan, Vietnam, United Kingdom, and Indonesia are the nations leading the way in green banking publication, as shown by the quantity of citations and articles.

Table 6: Major Countries

Countries	No. of Articles	Citations
Bangladesh	19	468
Malaysia	24	369
China	9	363
India	26	336
Pakistan	16	335
Vietnam	6	80
United Kingdom	7	78
Indonesia	6	44

Source: Table Created by author

Thematic Representation

Table 7 displays the most occurred keywords. 857 keywords were found from 129 articles. The keywords which appeared at least 4 times are represented by co-occurrence network map (Figure 2). Green banking, banking and sustainability are the keywords that occurred maximum number of times.

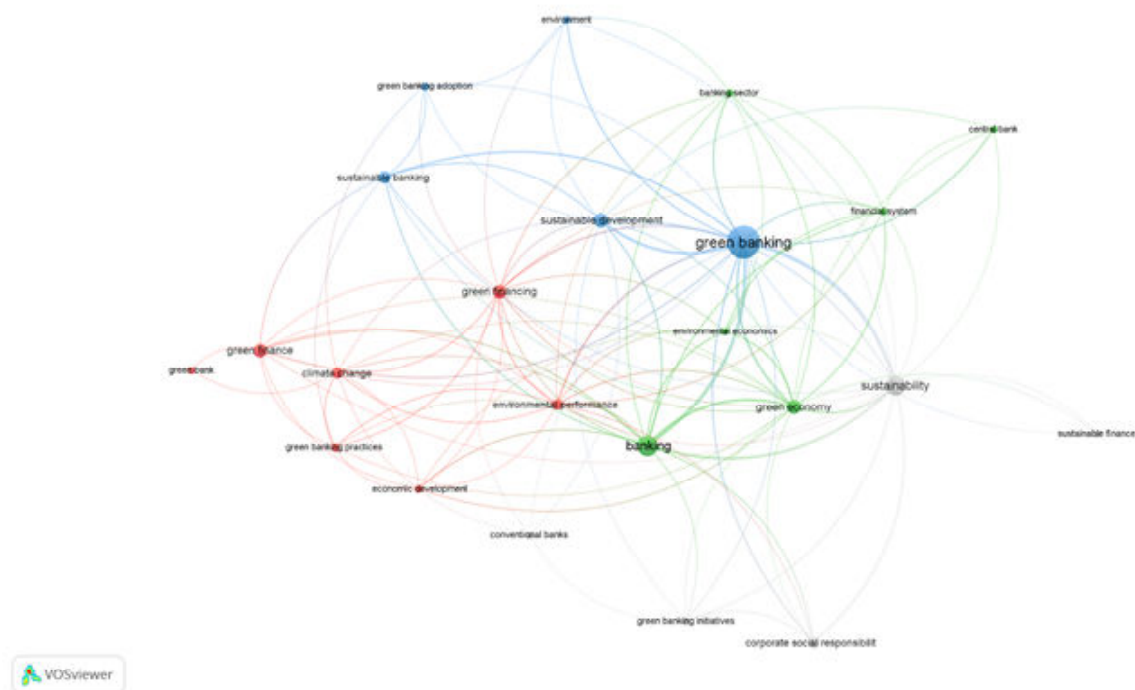
A green banking node may be found in the key thematic cluster, which is indicated by the thick lines that represent green banking, green banking adoption, environment, sustainable banking, and sustainable development. Examining the keywords makes it evident that the network covers research on green finance, especially in relation to the environment and sustainable development. Phrases like "green banking practices," "green financing," and "economic development" comprise the other cluster. These keywords display alternative approaches for researching in the area of green banking. Another node is the banking industry, indicating the researchers' field of study. Finally, green banking has also been explored in the fourth cluster, which reflects conventional banks and corporate social responsibility and shows how green banking has complimented both notions. We deduce that all of the clusters have a substantial degree of interconnectedness. The fact that some keywords are less prevalent may show more possibility for future growth in these kinds of investigations.

Table 7: Most Occurred Keywords

Keywords	Occurrence
Green banking	65
banking	26
sustainability	23
green economy	13
sustainable development	13
green finance	12
green financing	11
sustainable banking	10
environmental performance	8
climate change	8
corporate social responsibility	6

Source: Table Created by author

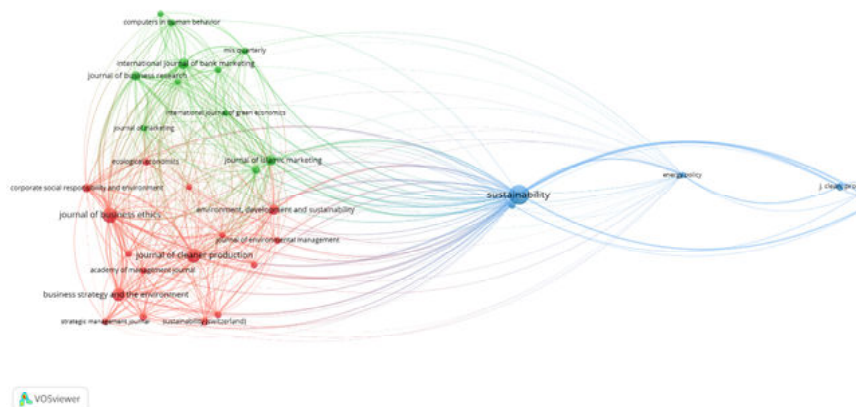
Figure 3: Co-Occurrence Network of Keywords



Source: Figure created by author

The co-citation of journals is displayed in Figure 4. The first cluster includes business journals such as "the Asia Pacific Journal of Management" and the "Academy of Management Journal". All of the publications that are displayed on the map are well-known periodicals. Other clusters include journals that are transdisciplinary or related to computer systems. Since finance, economics, marketing, and computer applications accounted for the bulk of the journals chosen to publish green banking, it is likely that digital technology plays an important role in the new green banking.

Figure 4: Co-Citation Network of Journals



Source: Figure created by author

Recent Research Trends

Table 8 lists the most popular and active subjects in green banking research according to various sorts; this list could be useful for aspiring researchers. It includes a list of 21 articles that have been studied in 2023 as a representative of the field's recent advancement.

Table 8: Recent Publication Trend in the field

Citations	Objectives
Aslam W.; Jawaid S.T. (2023)	Analyse the way green banking has affected financial, operative, and environmental functioning of banks.
Musyaffi A.M.; Santika A.Z.; Zairin G.M.; Johari R.J.; Rosnidah I.; Mentari M. (2023)	Examine reluctance among consumers of green banking technology.
Malc D.; Dlačić J.; Pisman A.; Milfelner B. (2023)	Create and verify a perceived e-banking service quality rating system.
Donath L.; Mircea G.; Neamtu M.; Sirghi N. (2023)	Examine whether other banks' interactions with one another affect the views of banks when they decide to go green.
Khan I.U.; Hameed Z.; Khan S.U.; Khan M.A. (2023)	Examine Islamic banks' green banking activities in an emerging Islamic nation.
Valencia D.C.; Calabuig-Tormo C. (2023)	Analyse experimentally how the green banking affects banks' environmental functioning and green funding.
Bedendo M.; Nocera G.; Siming L. (2023)	Examine the traits of banks that offer environmentally friendly bonds.
Merli M.; Pallud J.; Pulikova M. (2023)	Examine what motivates people to use online green banks.
Hassan M.K.; Islam M.T.; Ahmed Z.; Sarker J.I. (2023)	Evaluate Bangladesh's research on Islamic banking, perform a bibliometric study.
Ellahi A.; Jillani H.; Zahid H. (2023)	Determine how far green banking exercises have come.
Siemionek-Ruska M.; Fanea-Ivanovici M. (2023)	Examine the green banking offerings and services offered by the top five banks in Poland based on customer volume.
Taneja S.; Özen E. (2023)	Examine the effect of green financing efforts on the environmental operation of the banks.
Boros A.; Lentner C.; Nagy V.; Tózsér D. (2023)	Examine the perspectives and experiences that the impacted parties have regarding the sustainability-related procedures in the Hungarian banking system, in addition to their attitude towards the environment.
Manoj S.; Kumari P.V.P. (2023)	discusses the most recent advancements in sustainability made by Indian banks by using suitable green banking techniques and tactics, as well as the difficulties encountered in putting them into effect.
Herrador-Alcaide T.C.; Hernández-Solís M.; Cortés Rodríguez S. (2023)	determines the banking sector's role and maps the connections between the obstacles preventing the growth of green supply chains using scientific methods.
Al Amin M.; Ahad Mia M.A.; Bala T.; Iqbal M.M.; Alam M.S. (2023)	Analyse the post-usage satisfaction of the green finance consumers.
Aslam W.; Jawaid S.T. (2023)	Aim to integrate the "technology-organizational-environmental framework (TOE)" with the "diffusion of innovation (DOI)" to decide the aspects that impact the implementation of "green banking practices" (GBP)
Murshudli F.F. (2023)	Examine the impact that global green financing has on developing nations' ability to sustain their environment.
Bouteraa M.; Raja Hisham R.R.I.; Zainol Z. (2023)	Examine the obstacles preventing UAE bank customers from implementing green banking technology.
Jain P.; Sharma B.K. (2023)	Examine how the firm's sustainable environmental performance is affected by green financing methods.
Nahar H.S.; Mohamad M.; Rahman N.R.A. (2023)	Review of three main aspects of sustainable finance green banking, green finance, and microfinance are reviewed.

Source: Table Created by author

Practical Implications

The study will assist individuals, banks, researchers, and economies in realising the significance of green banking, as it can boost the profitability of private and public sector banks by increasing finance and investment in environmentally friendly projects, improving operational efficiency, and improving sustainable environmental performance. It also offers benefits to the researcher in the field by examining the state of research, future directions, and development trends in green banking. They can forecast green banking future trends. It was discovered during the study that only a limited number of countries' scholars are actively working to understand green banking practices. Research from the nations who are falling behind can also fill up that gap in the area.

Conclusion

"Affordable and Clean Energy," the seventh goal included in the UN Sustainable Development Agenda, encourages access to renewable energy. Goal No. 13 also addresses climate change, which is brought on by industrial processes, land usage, and fossil fuels. Green banking is essential to accomplishing these objectives.

The study's inferences imply that the academic community has become very interested in the crucial topic of green banking after the COVID-19 outbreak. The large increase in publications observed throughout this period suggests a notable boost in interest and significance in the area. As a noteworthy piece of bibliometric study, this work makes a novel contribution. There are a number of limitations on this investigation as a result of the documents chosen for analysis. Even if the majority of the greatest articles in this field of study are gathered in the database of choice, Scopus, sometimes there are pertinent studies missing. Moreover, it is possible that some of the scanned papers did not contain the chosen keywords, which could have had a different effect on the research's conclusions. There is a good possibility to explore new avenues because this is a young topic with limited study. The purpose of this study is to clarify the issue and encourage more research on the same topic in the future. Since the field of green banking is still relatively new, there is enough room for further research in light of various approaches. Subsequent scholars may choose to concentrate on conducting study on other associated ideas such as green bonds and green financing. These are very fresh ideas that are evolving quickly. Most research in the work already done is concentrated on green banking. There is a scarcity of study in this field in many other nations, which should also consider the subject being studied. Green banking can be applied by researchers to integrate ICT learning, technostress, and sustainable development to create new indicators. In the future, researchers may also conduct meta-analyses on this subject. The right evolution of identifying the different elements influencing green banking is also crucial.

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FACILITATORS OR EXPLOITERS? REASSESSING THE ROLE OF INTERMEDIARIES IN FARMERS' FINANCIAL WELL-BEING

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Abstract

This study investigates the multifaceted role of agricultural intermediaries in shaping the financial well-being of farmers within Punjab's basmati rice supply chain. Drawing on qualitative interviews with 13 farmers and 11 intermediaries, the research highlights the contradictory perceptions surrounding intermediaries: while some farmers view them as indispensable facilitators providing credit, liquidity, and market protection, others frame them as exploitative actors who manipulate records, hoard produce, and entrench farmer dependency. The findings highlight that financial well-being extends beyond objective metrics such as income and margins to include subjective evaluations of fairness, autonomy, dependence, and security. Farmers' resistance to reforms aimed at disintermediation reflects not only economic rationality but also relational embeddedness, as many fear destabilizing long-standing socio-economic ties despite potential price gains from direct sales. Conversely, others support disintermediation as a pathway to transparency and bargaining power. The study contributes to debates on market reforms by demonstrating that intermediary systems, while exploitative in nature, continue to perform critical protective and financial functions. Policy implications include strengthening farmer cooperatives, enhancing credit flexibility, and instituting regulatory reforms to curb malpractice while safeguarding farmers' socio-economic security.

Keywords: Intermediaries, Farmers, Financial well-being, Agriculture markets.

Introduction

Historical Background

At the time of India's independence, farmers faced severe hardships due to non-remunerative prices, high marketing costs, and frequent physical losses of produce, which necessitated reforms to safeguard their economic interests. The idea of regulated markets, however, predated independence: the first regulated market was established in Karanja (Hyderabad) in 1886, followed by the Berar Cotton and Grain Market Act of 1887, which empowered the British administration to notify markets and establish committees for their supervision (Paty & Gummagolmath, 2015). Later, the Royal Commission on Agriculture (1928) also emphasized regulation of marketing activities, leading to the Agricultural Produce (Grading and Marketing) Act, 1937, which vested state governments with statutory powers to regulate agricultural markets (Ghosh, 2013). Although progress was gradual, by the 1960s and 1970s, most Indian states had enacted Agricultural Produce Marketing Regulation Acts, under which organized market yards were developed and Agriculture Produce Market Committees were established to frame and enforce regulations (Singh, 2010).

The early decades of independent India witnessed various states forming and passing acts for the management of agriculture marketing operations at regulated markets (Ghosh, 2013). These legislative efforts, also referred to as the Agriculture Produce Marketing Committee (APMC) Acts, aimed to protect farmers from exploitation by private traders and to minimise the price spread between producers and consumers (Singh, 2010). Traditionally, a significant portion of agricultural produce was sold by farmers to moneylenders and local

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traders, often at prices way lower than prevailing market prices. Farmers usually brought their produce to mandis (agriculture market yards) where they were confronted with mighty traders and commission agents (called arhatiyas in the local language), who would capitalise on farmers' lack of awareness and illiteracy to cheat them. For instance, arhatiyas deducted various unspecified expenses from payments owed to farmers, thereby providing them with reduced and non-remunerative prices for their produce (Misra & Puri, 2008). On account of limitations of unregulated marketing activities, the Agriculture Committee Marketing Committee Acts (APMC) were enacted. As per these acts, the regulation of such markets is done by a Market Committee, which has nominees from different stakeholders like - state government, brokers, farmers, and arhatiyas (Ghosh, 2013). The committee is vested with various responsibilities like - (i) ensuring prevention of unauthorised deductions by arhatiyas from payments owed to farmers; (ii) providing market information to farmers; (iii) making use of standardised weights; (iv) fixation of brokerage, weighing, and lifting charges (Misra & Puri, 2008).

The APMC Acts mandate that all agricultural marketing activities be done only through licensed intermediaries (arhatiyas), thereby prohibiting any sort of direct connectivity between the farmers and traders. By ensuring only licensed intermediaries facilitate the transactions, these acts aim to keep a check on potential malpractices that result in the exploitation of the farmers. In events where intermediaries engage in unethical and unauthorised activities, their licences can be cancelled (Ghosh, 2013; Singh, 2010). However, with the passage of time, the state-regulated market facilities could not keep pace with the increase in output and witnessed no continuous improvements in infrastructure. Despite this, farmers were forced to rely solely on intermediaries due to the provisions of the APMC Acts, thereby increasing their dependency and subsequent exploitation. Over time, these middlemen established a monopoly across the agricultural supply chain and entrenched themselves as an indispensable force within it (Chand, 2020).

Agriculture Intermediaries and Farmers' Financial Well-being

A substantial body of scholarship has examined the influence of agricultural intermediaries on farmers' financial well-being, particularly in terms of economic returns and profit margins (Gandhi et al., 1999; Khushk, 2001; Mitra et al., 2018; Kuijpers et al., 2022; Xhoxhi, 2014). While this literature provides important insights, the findings remain inconclusive and at times contradictory. On the one hand, intermediaries have been depicted as parasitic actors who appropriate a disproportionate share of value by manipulating prices, creating information asymmetries, or exploiting farmers' weak bargaining position. On the other hand, another strand of scholarship has emphasized their enabling role, suggesting that intermediaries can enhance financial stability by providing access to credit, liquidity, and market linkages that farmers might otherwise lack. Taken together, this body of work reflects the complex and multifaceted position that intermediaries occupy within agricultural marketing systems.

Nevertheless, most of these studies have tended to conceptualize farmers' financial well-being in narrow, objective terms by focusing largely on economic metrics such as profits, incomes, and margins. While such indicators are undoubtedly important, they capture only one dimension of financial well-being. Recent scholarship in behavioral economics and financial psychology emphasizes that financial well-being also has a subjective dimension, encompassing how individuals themselves evaluate their financial condition, security, and capacity to manage risks (Iannello et al., 2021; Sorgente et al., 2024). For farmers, these subjective evaluations are particularly critical, as their experiences of financial well-being are shaped not only by realized profits but also by perceptions of fairness in transactions, dependence or autonomy vis-à-vis intermediaries, and the degree of security or vulnerability they feel in their economic relationships.

To address this gap, the present study moves beyond purely economic assessments and undertakes a qualitative exploration of how farmers themselves perceive the role of intermediaries in shaping their financial well-being. By foregrounding farmers' voices and lived experiences, the study aims to capture both the enabling

and constraining dimensions of intermediation, thereby providing a more holistic understanding of how financial well-being is negotiated in practice. Apart from exploring the role of intermediaries and their implications on farmers' wellbeing, the study also assesses how farmers would perceive their financial viability if reforms aimed at disintermediation are implemented.

Methodology

This study focuses on basmati rice farmers in Punjab, India. Punjab was selected as the research site because it has a historically entrenched mandi (agricultural market) system in which arhatiyas play a pivotal role in mediating transactions between farmers and buyers (Sinha, 2020). Within this context, basmati farmers represent a particularly critical case for examining intermediary dynamics. First, Punjab is among the largest contributors to India's basmati exports, making the crop economically significant at both regional and national levels (APEDA, 2025). Second, unlike wheat and paddy, basmati rice does not fall under the government's minimum support price (MSP) regime. The absence of MSP creates heightened dependence on arhatiyas for credit provision, liquidity, and price discovery (Press Information Bureau, 2024).

The analysis draws on qualitative interviews with 13 farmers engaged in basmati cultivation and marketing, complemented by 11 interviews with arhatiyas. Including both groups not only ensured representational balance but also allowed arhatiyas to clarify and contest farmers' claims, thereby minimizing researcher bias. Participant recruitment began with convenience sampling to identify accessible respondents (Stratton, 2021). Rapport-building and assurances of confidentiality facilitated access and trust. Subsequently, snowball sampling was employed to expand participation across both stakeholder groups by leveraging social networks (Heckathorn, 2011).

Reliability of qualitative data was ensured through independent coding by all three authors, guided by a shared protocol and established frameworks (Gibbs, 2007; Morse et al., 2002). Coding procedures emphasized transcription accuracy, consistent application of code definitions, and intercoder agreement. Validity was enhanced through member checking (Kaur & Singh, 2021), whereby selected participants reviewed summaries of interpretations to confirm their accuracy and resonance with lived experiences. This process strengthened the credibility and trustworthiness of the findings.

Findings

The qualitative findings indicate that the role of intermediaries in shaping farmers' financial well-being is complex and perceived differently by farmers depending on their individual experiences. These perceptions are influenced by factors such as access to credit, market knowledge, relational ties, and previous encounters with intermediaries. The following sub-sections elaborate on the diverse ways in which farmers interpret the influence of intermediaries on their economic outcomes:

Intermediaries as Facilitators

Farmers frequently articulated the perception that intermediaries are not merely transactional intermediaries but critical facilitators of financial well-being and socio-economic stability. Farmers emphasized that the embedded system wherein intermediaries bridge transactions between farmers and millers continues to be indispensable for sustaining their livelihoods. For many, financial well-being is not determined solely by crop prices but by broader access to financial resources, both personal and agricultural, that intermediaries reliably provide.

Several farmers described how intermediaries serve as a vital source of personal finance in times of distress, especially when access to formal credit is constrained by limited collateral or cumbersome procedures. One of the farmers, for instance, reflected on his long-standing relationship with his intermediary, who became the sole source of assistance during a family emergency:

"I am a smallholder farmer. When my daughter was getting married, I did not have enough liquid money to meet the expenditures. It was difficult to obtain a personal loan from banks because I do not have many assets. My arhatiya immediately provided me with INR 2 lakhs without demanding any collateral. I remain grateful to him." (Farmer #5)

Beyond personal needs, intermediaries are particularly valued for facilitating agricultural production, especially in the case of high-input crops such as Basmati rice. Smallholders consistently reported heightened financial pressure before sowing, given the high costs of seeds, fertilizers, and pesticides. In these contexts, intermediaries customarily extend credit, or in some cases provide inputs directly, thereby easing farmers' liquidity constraints and enabling them to cultivate premium-quality crops.

As one farmer noted:

"Basmati is expensive to grow as it is a premium crop. While it can yield higher profits, the input costs are very high. Arhatiyas provide loans that allow us to purchase seeds and fertilizers. Once the crop is sold in the mandis, they deduct their dues and return the remaining proceeds. This makes Basmati farming feasible and profitable for us." (Farmer #3)

In addition to ensuring financial sustainability, intermediaries also function as guarantors of liquidity in the agricultural economy. Farmers emphasized that while millers are typically allowed a credit period of 14 days to clear auction payments, intermediaries often provide immediate cash to cultivators at the time of crop delivery, even before receiving payments from millers themselves. This bridging mechanism reduces liquidity shortages and helps farmers meet urgent household or farm-related expenses.

Interestingly, several farmers also framed intermediaries as protective institutions against the opportunistic behavior of millers. Lacking direct bargaining power, farmers perceived themselves as vulnerable to collusion among millers, who often attempt to suppress Basmati prices in mandis, particularly in the absence of a government-backed Minimum Support Price. In such scenarios, intermediaries reportedly intervene by withholding or stockpiling crops to create conditions of artificial scarcity, thereby compelling millers to bid higher. Farmers further noted that intermediaries sometimes advise delaying sales strategically to counter temporary slumps in mandi prices.

As some farmers explained:

"It is common for millers to come together and offer lower prices for our crops. In such cases, arhatiyas hold back the stock for a few days, creating a perception of reduced supply. Last year, when millers were deliberately offering lower-than-market prices, my arhatiya advised me to delay sales slightly. Following his guidance, I was able to secure good prices." (Farmer #11)

"Last year millers were deliberately offering lower than market prices to basmati farmers. Arhatiyas guided us to make a slight delay in the sales so as to counter the slump in the mandis. I took arhatiya's advice seriously and was able to fetch good prices." (Farmer #9)

Resistance to Disintermediation Efforts

Nearly all farmers who perceived intermediaries as facilitators of their socio-economic well-being expressed strong resistance to disintermediation efforts, even when presented with the hypothetical option of selling crops either through intermediaries or directly to millers. Farmers consistently argued that bypassing intermediaries would not generate meaningful economic gains but would instead risk destabilizing long-standing relational ties. Such moves were perceived as jeopardizing access to crucial financial and social support, since intermediaries might interpret farmers' direct engagement with millers as abandonment, prompting them to withdraw services. The resistance articulated here reflects not only economic rationality but also the relational embeddedness of farmer-intermediary interactions, where trust, reciprocity, and loyalty underpin the continued provision of financial and non-financial assistance. In this way, disintermediation is seen not as an opportunity for greater autonomy, but as a potential threat to the relational contracting that sustains farmers' livelihoods.

Farmers repeatedly underscored the risks associated with alienating intermediaries, particularly in moments of crisis:

"Whenever there is an emergency, I can ask arhatiyas for money. They give us loans for agricultural as well as personal needs. If arhatiyas come to know that I am engaging directly with millers also, then I think they will get offended and not provide me the support they usually do." (Farmer #8)

Another farmer explained how the flexibility and leniency of arhatiyas in repayment schedules contrasts sharply with the rigid terms of formal institutions:

"Sometimes farmers are unable to meet their loan repayment obligations, as we have various other financial obligations. Arhatiyas are generally kind enough to lend us an extended credit period. They understand the financial problems of the farmers. If farmers start selling directly, why would arhatiyas give us loans? Farmers can expect such services as long as they are exclusively associated with their arhatiya. If we abandon ties with them, then bank loans are the only option. What if a financial emergency arises and the farmer is not able to repay a bank loan on time? There will be serious consequences. It is better to remain with the arhatiyas because at least they are more liberal and understand our financial needs." (Farmer #1)

Some farmers also articulated strong apprehensions regarding potential structural changes in agricultural supply chains if direct selling were to be permitted alongside the existing mandi system. They feared that such reforms, although seemingly beneficial in the short term, could destabilize the delicate balance between intermediaries and millers. Farmers anticipated that resource-rich millers would initially compete aggressively with intermediaries by offering higher procurement prices, thereby enticing farmers to sever their long-standing ties with intermediaries. While this may temporarily improve farm-gate prices, farmers predicted that over time such dynamics could undermine the viability of the mandi system by eroding the business base of intermediaries.

The long-term implications of such a shift were perceived as potentially harmful to farmers' financial well-being. Without the counterbalancing presence of intermediaries, millers would be in a position to exercise monopoly control over procurement. Farmers feared that once mandis collapse, millers could dictate prices unilaterally, with little opportunity for farmers to negotiate or seek alternative buyers. In their view, this would result in diminished bargaining power, reduced transparency, and lower farm incomes in the long run.

"Initially, millers would offer good prices so that farmers would sell directly to them. If this keeps happening, over the years, mandis would shut down because arhatiyas will have no business with them. Once this happens, farmers will completely get dependent on the millers who might offer lower prices after some years." (Farmer #7)

Intermediaries as Exploiters

In contrast to accounts that portray arhatiyas as facilitators of financial security, many farmers described them as opportunistic actors who erode their profit margins and diminish their financial well-being. These farmers argued that intermediaries exploit their structural position in the mandi system by leveraging information asymmetries and farmers' lack of bargaining power against millers.

A common concern raised was the practice of hoarding. Farmers alleged that arhatiyas often resort to fabricating transaction records to conceal crops from the official auction system. By generating fictitious bills showing sales/purchases to buyers/sellers who do not actually exist, intermediaries create the appearance that the produce has already been transacted. In reality, however, the crops remain in their possession. Once market conditions improve, the intermediaries release the hoarded stock and sell it to millers at inflated prices. Farmers emphasized that such strategies allow intermediaries to capture gains from price fluctuations that could otherwise benefit producers.

From the farmers' perspective, this manipulation of auction procedures represents a fundamental breach of the intermediaries' formal role, which is to facilitate transparent exchanges between farmers and millers.

Instead, the control that intermediaries exert over both information flows and the timing of transactions enables them to distort market signals for private benefit.

"While arhatiyas receive a fixed commission for facilitating transactions, their self-interest often comes into play. There have been instances when the arhatiyas work in sync with each other and procure crops from farmers and issue fake J-bills (proof of sale issued by arhatiya to farmer), falsely showing that the crop has been sold at a particular rate. In reality, they stockpile the crops and wait for a surge in demand. When they see that millers are in urgent need of the crop, they exploit the situation by selling the crops at inflated prices. Once again, they generate fake I-bill (proof of purchase issued by arhatiya to miller) to formalise these transactions and ensure their profits at the expense of both farmers and millers." (Farmer #4)

Another malpractice highlighted by farmers concerns the manipulation of transaction records to divert a portion of the sale proceeds. Farmers alleged that intermediaries frequently exploit their market power to pressure millers into paying amounts higher than what is officially recorded, while underreporting the transaction value on paper. As a result, farmers receive lower payments than what millers have actually disbursed, with the surplus being appropriated by intermediaries. Given that intermediaries are formally entitled to a commission of only 2.5% on each transaction, such practices allow them to extract rents well beyond their legitimate entitlement. This not only undermines the transparency of the auction system but also directly reduces farmers' earnings, thereby adversely affecting their financial well-being.

"Whenever a farmer's crop is auctioned, arhatiyas are supposed to issue a J-bill to us. This bill shows details like the rate at which the crop is sold. As arhatiyas have a dominant position, they dictate terms and conditions to farmers as well as millers. Sometimes they exert monopoly-like control over millers and compel them to pay more than what they are actually bidding. Millers have to bend to their demands, because they also don't have any option. In reality, the arhatiyas collect higher payments from millers, but underreport a lower amount in the bills and eventually pass on reduced payments to farmers, while keeping the extra money with themselves." (Farmer #12)

Contrary to the commonly held perception that loans extended by intermediaries significantly enhance farmers' financial well-being, a substantial segment of farmers viewed these lending practices as a mechanism of captivity rather than empowerment. While acknowledging that intermediaries provide a vital source of credit, particularly in the absence of accessible and timely institutional loans, farmers argued that such financial assistance often comes at the cost of autonomy in market transactions. They emphasized that once indebted to an intermediary, farmers enter into a moral and relational obligation to transact exclusively through that intermediary, even when more remunerative opportunities exist elsewhere. This dependency restricts farmers' ability to maximize returns by selling to buyers offering higher prices, thereby constraining the overall financial viability of their agricultural enterprise.

"There is no doubt that arhatiyas play a crucial role in providing loans to farmers, but it's far from charity. They charge significantly high interest rates, yet due to the challenges of securing bank loans, farmers often have no alternative. arhatiyas are usually eager to offer loans. Once a loan is taken, we are bound to maintain business relations with that arhatiya, such that we sell our crop through that particular arhatiya only. This way, they not only earn from commissions but also secure high returns through interest on loans." (Farmer #6)

Support for Disintermediation Efforts

In contrast to farmers who emphasized dependence on intermediaries, another group of farmers expressed strong support for marketing arrangements that would allow both direct and indirect channels to operate simultaneously. They argue that such a hybrid system would reduce the excessive influence of intermediaries and curb exploitative practices such as hoarding, falsification of records, or underreporting of prices. Farmers believe that disintermediation, even if partial, would introduce competition into the supply network and prevent intermediaries from exercising monopolistic control over transactions. By retaining the ability to sell either through intermediaries or directly to millers, farmers feel they could negotiate better prices and thus strengthen their financial position.

"If such a thing happens, things will get difficult for intermediaries. They will not be able to do manipulations like storing the crop and mentioning wrong details in the invoices. Millers will also save mandi taxes and charges if they procure directly from us. In fact, millers will be in a better position to offer good prices to farmers." (Farmer #10)

"It's good if such a system comes in place. We will get better options to sell our crops. I will sell my crop through arhatiyas if everything is going well in mandis. If not, then I can also think of selling to millers. At the end, my decision to sell-whether to an arhatiya or to a miller-depends on who is ready to offer the better price." (Farmer #6)

From the farmers' perspective, such diversification of marketing options has a direct bearing on their financial well-being. First, it enhances transparency in price discovery by reducing the scope for intermediaries to manipulate transaction records or withhold payments. Second, by enabling millers and intermediaries to compete for procurement, farmers can maximize their revenues and improve profit margins. Finally, farmers argue that having more than one reliable sales avenue reduces vulnerability to opportunistic practices and provides a sense of economic security.

Overall, the support for disintermediation was grounded not in a desire to eliminate intermediaries altogether, but in the aspiration to create a more competitive and transparent marketplace where farmers' bargaining power is strengthened and their financial well-being safeguarded.

Exploring Intermediaries' Claims and Dissonance in the Perception of Farmers

The qualitative findings revealed a spectrum of perceptions among farmers regarding the role of intermediaries, ranging from highly positive to deeply critical. This is known as dissonance i.e., when respondents of a same group exhibit divergent opinions (Farmer et al., 2006). For some, financial well-being was closely tied to the intermediary system, with arhatiyas perceived as indispensable providers of credit, liquidity, and market security. In contrast, others emphasized the exploitative practices of intermediaries, portraying them as opportunistic actors who erode farmers' margins and restrict their autonomy. This dissonance in farmers' views does not reflect inconsistency or irrationality. Rather, it brings to light the subjective nature of how individuals appraise institutions and relationships, which is shaped by their specific socio-economic contexts and lived experiences. Farmers who have benefitted from credit access or price protection tend to evaluate intermediaries favorably, whereas those who have encountered exploitative practices highlight the constraints imposed by the same system. Thus, the diversity of perspectives reveals the coexistence of both enabling and constraining dimensions of intermediation, reflecting how financial well-being is mediated through situational realities rather than uniform structural effects.

For instance, as highlighted earlier, some farmers (#9 and #11) perceived the hoarding strategies of arhatiyas as protective measures against the opportunistic practices of millers, particularly collusion to depress crop prices. By temporarily withholding crops, intermediaries were seen as leveraging market scarcity to secure higher returns for farmers. In contrast, others, such as Farmer #6, emphasized the exploitative dimension of hoarding, framing it as a strategic tool used by intermediaries primarily to increase their own profits while denying farmers fair margins. Interestingly, intermediaries themselves defended such practices, claiming that temporary withholding of crops was a necessary corrective mechanism to counter artificial market slumps engineered by millers.

"Sometimes we have no option. If millers group together and offer low prices in mandi, we create an illusion of artificial scarcity so that the prices of the crop grow up. We actually don't hoard the crop; we just delay the auction." (Arhatiya #7)

Farmers also expressed divergent opinions on the financing role of intermediaries. For some, such as Farmer #3 and Farmer #5, the provision of credit was regarded as an essential function that underpinned the socio-economic stability of smallholders. These farmers emphasized that access to timely loans, both for personal needs and for agricultural inputs, was critical in sustaining livelihoods in the absence of accessible institutional

credit. In their view, the financing role of intermediaries directly contributed to financial well-being by providing liquidity at crucial junctures.

In contrast, others such as Farmer #6 highlighted the more coercive dimension of intermediaries' money-lending practices. For them, credit was less a mechanism of empowerment and more a tool of captivity. They argued that indebtedness bound farmers into exclusive transactional relationships with intermediaries, effectively denying them opportunities for competitive price discovery. Moreover, the high interest rates charged on loans enabled intermediaries to extract additional value beyond the statutory commission, further tightening their grip on farmers' financial outcomes.

Interestingly, intermediaries themselves presented a markedly different narrative, firmly rejecting farmers' claims of exploitation through lending. They emphasized the risks associated with advancing credit and pointed to frequent defaults as a structural reality of the system. Several intermediaries described how farmers often fail to repay either loans or the cost of inputs provided on credit. Despite these losses, they claimed to maintain long-standing relationships with farmers by continuing to facilitate the auction of their crops in mandis. Over time, many intermediaries reported internalizing these defaults as a "normal loss," an unavoidable component of their business model.

"A farmer had taken a high-amount loan from me. Ultimately, he was unable to pay the full amount. I had to suffer a big loss. But this is how things work. We understand farmers' financial condition and waive their loans many times. Despite that, we help them in getting their produce auctioned at good rates." (Arhatiya #4)

"Arhatiyas business is full of bad loans. Sometimes farmers do not have the money to pay back the money to us. In such cases, we also don't compel them to pay, as we show empathy with them. Many times, millers also do not pass on payment to us, but we make sure that the sales amount is remitted to the farmers. We do all this by assuming financial burden on ourselves." (Arhatiya #9)

Farmers, in particular, hold divergent views on the hoarding and money-lending practices of intermediaries. While one group of farmers regards these practices as essential support mechanisms that sustain their agricultural operations, another group views them as exploitative strategies that perpetuate financial dependence and limit opportunities for price discovery. Intermediaries, for understandable reasons, tend to align their narratives with the former group, presenting themselves as facilitators who shoulder financial risks on behalf of farmers, while outrightly rejecting the latter group's accusations. However, this divergence does not imply that the farmers who describe intermediaries as exploiters are misrepresenting reality. On the contrary, their claims are substantiated in grey literature (Hindustan Times, 2015; The Wire, 2020), which documents instances of debt entrapment, excessive interest charges, and manipulation of produce sales.

Discussion

The findings of this study reveal a complex and often contradictory role of agricultural intermediaries in shaping farmers' financial well-being. While prior research has offered conflicting interpretations of intermediaries: as either parasitic actors extracting rents or enabling agents facilitating access to markets and liquidity, our analysis demonstrates that both perspectives co-exist in the lived experiences of farmers. This coexistence represents that financial well-being cannot be understood solely through the lens of objective economic metrics such as income and margins. Instead, it must also account for subjective evaluations, including farmers' perceptions of fairness, autonomy, dependence, and security in their interactions with intermediaries.

Importantly, the study highlights how the same practices can be perceived as both supportive and exploitative, depending on farmers' circumstances. For instance, hoarding was framed by some respondents as a protective strategy against millers' collusion, while others described it as a deliberate act of exploitation that denied them rightful margins. Similarly, credit provision was lauded as a lifeline for smallholders lacking access to

formal loans, yet simultaneously criticized as a mechanism of captivity that entrenches dependency. These divergent perspectives emphasize that the impact of intermediaries is not monolithic but mediated by situational realities such as farmers' indebtedness, resource constraints, and relational histories with intermediaries.

The findings also shed light on why reforms aimed at disintermediation remain highly contested. For farmers who derive financial and social security from their intermediaries, bypassing them is seen as destabilizing long-standing ties and jeopardizing access to crucial support. Conversely, for those who experience exploitation, disintermediation is perceived as a pathway to transparency, competition, and empowerment. The resistance and support for reforms thus reflect not only economic rationality but also relational embeddedness and subjective appraisals of financial well-being.

Importantly, the fears of structural transformation articulated by farmers are not irrational. Precedents from other supply chains demonstrate that when direct connectivity between buyers and producers is ensured, intermediaries can be entirely displaced, resulting in significant market shifts and vulnerability for previously dependent actors (Li and Choi, 2009). Such historical examples help explain why farmers may simultaneously value the support intermediaries provide while fearing reforms that might eliminate them.

The findings indicate that many farmers prefer to remain linked with intermediaries even when direct market access could potentially yield higher prices, largely to safeguard their socio-economic security. This highlights the need for a comprehensive reassessment of existing financial independence programs, such as the Kisan Credit Card (KCC) Scheme, which aims to address agricultural financing needs. While these initiatives provide substantial support, they are limited by conditions such as restricting credit to agricultural use based on acreage and cropping patterns, thereby precluding use for personal financial requirements (Gaikar, 2021). Consequently, farmers often remain dependent on intermediaries for non-agricultural financial needs. Expanding the flexibility of such schemes, for instance, by allowing a designated portion of credit to be used for personal or non-crop-related expenses, could enhance farmers' financial autonomy and reduce reliance on intermediaries.

Furthermore, the study highlights that farmers' dependence on intermediaries for market access is partly due to limited bargaining power. Organizing farmers into Farmer-Producer Organizations (FPOs) could strengthen their collective voice and enable direct negotiations with millers, improving market access and price realization. Research has emphasized that FPOs can equip smallholders with organizational capacity, negotiation skills, and enhanced social standing, thereby reducing vulnerability to exploitative intermediaries and fostering greater economic agency (Hellin et al., 2009; Trebbin, 2014).

Lastly, in order to make sure that unauthorised practices like hoarding of crops, along with other malpractices like cartelisation do not take place, independent oversight and audit committees must be established to keep a tab on such activities and address grievances related to the functioning of intermediaries. A system of imposing hefty fines and penalties on those resorting to malpractices should also be brought in.

Conclusion

This study offers deep insights into the recent discourse surrounding the role of intermediaries in farmers' financial well-being. It emerged that intermediaries' role can range from exploiters to facilitators depending upon the situational circumstances and farmers' lived experiences. However, the study has several limitations that future research could address. First, the research was conducted exclusively in Punjab, where intermediary-farmer relationships have evolved over several decades. Replicating this study in other states would help assess whether the dynamics of intermediary-farmer interactions and their implications for financial well-being differ across regions. Second, future studies could complement qualitative interviews with ethnographic approaches to capture first-hand observations of intermediaries' roles in shaping farmers' financial outcomes. Such approaches would provide richer insights into everyday practices and relational dynamics. Finally, comparative studies examining

states without a formal mandi system, such as Bihar or Jammu and Kashmir, could illuminate how the absence of regulated markets affects farmers' financial well-being and dependence on intermediaries.

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LIFE INSURANCE RESEARCH: A BIBLIOMETRIC REVIEW

Brinda Rathod* and Kamini Shah**

Abstract

The paper aims to provide an overview of life insurance research from 2001 to 2024. The Bibliometric analysis was conducted to fulfil the research objectives. The Scopus database was used for the data extraction process. The PRISMA Flow Diagram was used in accordance with the updated PRISMA 2020 statement. A total of 511 papers were included in this study for data analysis. The researcher framed 5 research questions to analyze research papers using Vos-viewer. The analysis targets to know the growth of research on life insurance, key contributing countries, and authors. The analysis found that a lot of research on life insurance was undertaken in the year 2023. According to the key-contributing countries analysis, the US is the main contributing country to the Life insurance research work. The Journal of Insurance Mathematics and Economics has published the highest number of documents in the life insurance domain. This study provides insights for further research in life insurance.

Keywords: Life Insurance, Bibliometrics, Co-Authorship, PRISMA, Vos-viewer.

Introduction

Insurance is known as a contract to provide financial security, and it mitigates risks associated with individuals' valuable assets (Shamsuddin et al., 2022). It is widely recognized as a critical element of social security services, aimed at reducing poverty and enhancing living standards (Bhandari, 2018). Life insurance and general insurance are the two main types of insurances (Safitri, 2019). Different authors discussed various types of insurance, such as social insurance (Tabash et al., 2023) health insurance (Dragos et al., 2020) and other aspects of insurance, like Insurance related to technology (Ninova & Ninov, 2024), the blockchain usage (Eletter, 2024) in the insurance sector, insurance to protect against climate change (Nobanee et al., 2022), etc.

The life insurance industry plays a very important role in the financial service sector, that provide channel to mobilize savings and foster the economic development of a country (Zinyoro & Aziakpono, 2023). In life insurance research, some authors studied green and sustainable life insurance (Nobanee et al., 2021), and discussed green insurance development with green investment plans (Bhatia et al., 2020) discussed life insurance purchase behaviour and concluded that policyholders, insurance companies, and regulatory bodies are the main stakeholders in the insurance sector. By knowing the policyholders' behavior, the company can make policies according to the consumers' behavior. Greene and Segal (2004) studied the profitability and cost efficiency of the US life insurance industry and concluded that cost efficiency influences profitability and is related to earnings. Zinyoro and Aziakpono (2023) discussed performance determinants of life insurance providers and concluded that very little research work has been done on the performance of life insurance companies.

Today, insurance has become a very important tool to protect a person's valuable assets. Life is an asset for human beings. A person's life is not only their personal life; the entire family depends on the family's breadwinner. The mission of IRDA, "Insurance for all," encourages the goal of insurance penetration. Insurance services should reach every person in the country.

Worldwide View of Life Insurance Industry

Global Life Insurance penetration is 6 % (Bhatnagar, 2024). According to Capgemini Research Institute (2025), Life insurance at present faces a reducing penetration trend in mature markets. This report highlighted

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that the first major challenge for the life insurance industry is older technology. From a global perspective, life insurance is the largest market in the United States. The United States was the highest premium-earning country in life insurance, with premiums exceeding 600 billion US dollars in 2022. In comparison, the second and third biggest life insurance countries are China and the United Kingdom, respectively (Rudden, 2024). In the US life insurance industry, AIG, Prudential Financial, and Aflac are the most prominent life insurance companies. According to Agrawal et al. (2022), two parameters can help to create opportunities: increasing awareness of personal risk and near-term rates that can rise at nominal rates but will be low for a long time.

Most Americans depend on life insurance for their financial protection. For retirement and retirement safety, most Americans depend on life insurance. In America, gender differences exist in life insurance consumption. Males have 11% higher life insurance ownership than females (Horton et al., 2024).

Table 1: Worldwide Comparison of Insurance Penetration (in Percentage)

Sr. No	Country name	2022	2023
	America		
1	USA	2.6	2.6
2	Canada	3.3	3.3
3	Brazil	2.1	2.1
4	Mexico	1.1	1.1
5	Argentina	0.2	0.2
	Europe, the Middle East Africa		
6	South Africa	9.1	9.2
7	UK	8.1	7.1
8	Sweden	7.5	5.7
9	France	5.5	5.5
10	Netherlands	1.2	1.2
11	Italy	5.8	4.9
12	Switzerland	3	2.9
13	Germany	2.4	2.1
14	Spain	2	2.5
15	Turkey	0.2	0.2
16	Saudi Arabia	0	0.1
17	Russia	0.3	0.4
	Asia Pacific		
18	Taiwan	8.2	7.1
19	South Korea	5.4	5
20	Singapore	7.4	7.4
21	Japan	5.9	6.8
22	Thailand	3.4	3.4
23	Malaysia	3.7	3.7
24	Australia	0.9	0.9
25	India	3	2.8
26	China	2	2.1
27	New Zealand	0.8	0.4
28	Indonesia	0.9	0.8
29	Pakistan	0.6	0.5
30	World	2.8	2.9

Source: IRDAI Annual Report 2023-24

According to the data from the Insurance Regulatory and Development Authority of India, the above table shows the comparison of insurance penetration between different countries in the years 2022 and 2023. The data shows the highest life insurance penetration in South Africa, with 9.1% in 2022 and 9.2% in 2023. Taiwan and the UK have above 8% life insurance penetration, and in 2023, they had 7.1%. Saudi Arabia has the lowest life insurance penetration, with 0 and 0.1% in 2022 and 2023.

In India, it is 3% in 2022 and 2.8% in 2023. It shows a decline in life insurance penetration. As we can see, the data for the whole world shows that the life insurance penetration is increasing.

National View of the Life Insurance Industry

The Vision of Viksit Bharat 2047 indicates a vision for a golden period of India. Various steps to achieve this goal are taken by the Indian government. Every sector is playing an important role in Viksit Bharat 2047. The insurance sector also set a goal to insure all by the mission of "Insurance for all by 2047."-This vision is set by the IRDAI (Insurance Regulatory and Development Authority of India)

In India, the insurance industry has emerged as a main driver of economic growth, expanding at an impressive 32-34% annually. As of 2021, the country's insurance penetration rate was 4.2%, whereas life insurance penetration was 3.2% and general insurance was 1% (IBEF, 2023).

According to (Bhatnagar, 2024), The insurance penetration rate is 4% in India, which is less than the Worldwide life insurance penetration. India has a 25th rank globally in insurance penetration, whereas 27th rank in insurance density.

Methodology

Research Gap

The bibliometric analysis is a systematic study that provides an overview of a particular bibliographic document, including what has been studied and what has not. It also provides future directions for a research topic (Passas, 2024). Here, the authors selected research on life insurance to provide its bibliographic overview. Over time, the researcher/s studied this topic as descriptive and empirical research on this topic. The researcher studied bibliometric analysis using health insurance (Muresan, 1991), life insurance lapse (Shamsuddin et al., 2022), insurtech (Ninova & Ninov, 2024) and performance determinants of life insurers (Zinyoro & Aziakpono, 2023) but no bibliometric analysis is available for life insurance from 2001 to 2024. Therefore, this research paper is an attempt to fill this gap

Statement of the Problem

The problem statement is to undertake "Bibliometric analysis of Life Insurance research" to analyse the research done on life insurance systematically.

Significance of the Study

This study will be useful to know the research trends in life insurance worldwide. The insights from this paper can positively influence the mission of IRDA, "Insurance for all." This study helps to compare the life insurance sector in India with that of other countries

This research will help researchers and academicians to know the research trend in the life insurance domain and understand the international research methods. After understanding it, any researcher can enhance further research on life insurance in tandem with the research insights from the highest contributing Authors. This study provides life insurance research trends from 2001 to 2024 worldwide.

Research Objective

The primary objective of this research is to provide an overview of life insurance research based on

bibliometric analysis and to examine articles that focus on life insurance research. To fulfill this aim, different analytical techniques were used. The research questions below are provided to highlight the researcher's objectives.

Research Questions of the Study

- Q.1 What is the growth in the research publication in the life insurance domain?
- Q.2 Which countries contribute the most to research on life insurance?
- Q.3 Who are the key authors contributing the most to the research on life insurance?
- Q.4 Which documents and sources contribute to the research on life insurance?
- Q.5 Which keywords are used in the majority of research on life insurance?

Structure of the Research Paper

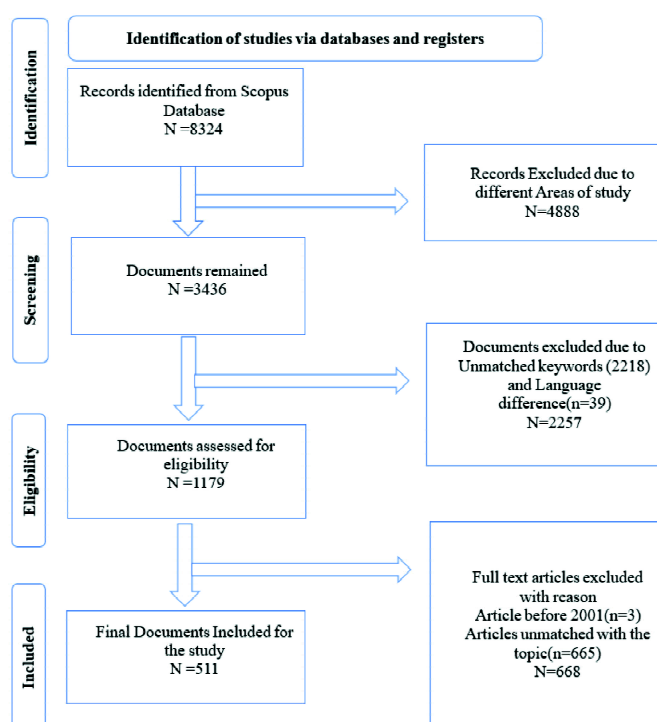
This paper is divided into four parts. The first part includes an introduction with its background; research implications for government and society, a worldwide view of the life insurance industry, a national view of research implications for government and society, research objectives, and research questions. The second part includes methodology, where the researcher discusses the process of data extraction applied in the paper, according to the PRISMA framework. Vos-viewer Software is used for analysis and data cleaning processes. The third part consists of the data analysis part, and the fourth part includes the conclusion, the future direction of research, and the limitations of the present study.

Data Extraction Process

Data was collected using the systematic method, following the steps given in the PRISMA Approach. PRISMA is a standard flowchart for presenting inclusion and exclusion criteria in the study. The authors used the updated PRISMA 2020 flow diagram to demonstrate the selection method (Page et al., 2021). Scopus was used for the data collection. The period under study is 2001 to 2024.

Figure 1: PRISMA Flow Diagram

Figure 1: PRISMA Flow Diagram



Source: (Kundy & Shah, 2024)
(Modified by the Authors)

Bibliometric analysis was applied to study the research trend of the Insurance sector from 2001 to 2024. The data was gathered from the Scopus database on 28th September 2024. The inclusion and exclusion criteria were followed as indicated in the PRISMA flow diagram. In the first stage, the database involved all the articles from different streams, such as computer science, medicine, law, history, psychology, education, business, and much more, and the time frame from 1978 to 2024. The researcher used Booleans like (OR) and (AND), an asterisk (*), and inverted commas (") to get more accurate results for the keyword search (Kundy & Shah, 2024)

Articles were searched using keywords related to Life Insurance such as ("life insurance" OR "life assurance" OR "life insurance sector" OR "life insurance industry" OR "life insurance enterprise" OR "life insurance compan*" OR "life insurance polic*" OR "life insurance market*" OR "insurance providers" OR "life insurance asset*" OR "life insurance firm" OR "life insurance corporation" OR "life insurance business" OR "life insurance operations" OR "life insurance sector" OR "life insurance agency*" OR "life insurance institutions") at the first stage. A total of 8324 articles were found that were from all fields. After excluding other streams and including business management, social sciences, economics, and articles were reduced to 3996. In the second stage, the article type selected is "Journal Article", or "Review Article", after which, 3436 documents remained. To reduce the number of articles that were not related to the research, author/s used the keywords mentioned above and got the number of articles that matched the keywords. In the last stage, authors used languages to exclude articles that were not written in English.

After that, the data from 2001 to 2024 was used to reduce the documents. The researcher investigated documents for removing duplicates. In the eligibility criteria, the author/s excluded three articles that were published before the year 2001 and articles that did not match the life insurance topic. In the inclusion criteria, a total of 511 documents were eligible for further analysis.

Software and Data Cleaning

The Vos viewer was used to analyze the data. The CSV file was exported from the Scopus database. The file included the author's name, year, title, volume, issue, journal name, abstract, authors' keywords, index keywords, affiliations, and authors with affiliations, etc. MS Excel was used for data cleaning, and Vos viewer was used for data Visualization.

Findings from the Study and Discussion

Publication Growth Over Time

Figure 2: Publication Growth from 2001 to 2024



Source: Created by authors

Figure 2 represents the publication growth of articles for the period 2001 to 2024. Here, overall growth is shown in the publication on the topic of life insurance. The minimum number of publications demonstrated in 2001 is 4. The average number of publications for this period is 19. As we can see in 2011, the publication growth showed the first peak, which is the highest growth during 2001 to 2015. From 2016 to 2024, the minimum number of publications was 20 in 2019. In this period, the highest peak is observed in 2023 with 41 publications.

Table 2: Publication growth

Year	Publications
2001	4
2002	5
2003	8
2004	8
2005	6
2006	7
2007	10
2008	15
2009	15
2010	14
2011	23
2012	17
2013	19
2014	24
2015	26
2016	25
2017	30
2018	31
2019	20
2020	33
2021	38
2022	33
2023	41
2024	19

Source: Made by authors

The number of publications was very low in the early 2000s but grew slowly throughout the decade. Starting around 2010, the number of publications increased more rapidly, reaching new highs almost every few years. During this time, most years had relatively high publication numbers compared to earlier decades, even with some drops, like the one in 2019. The early 2020s saw the highest overall output, peaking in 2023, which shows a surge in research activity. Although there was a noticeable drop in 2024, the long-term trend remains positive, showing a significant increase in publication output over the entire period.

Key Contributing Countries

According to the number of Documents

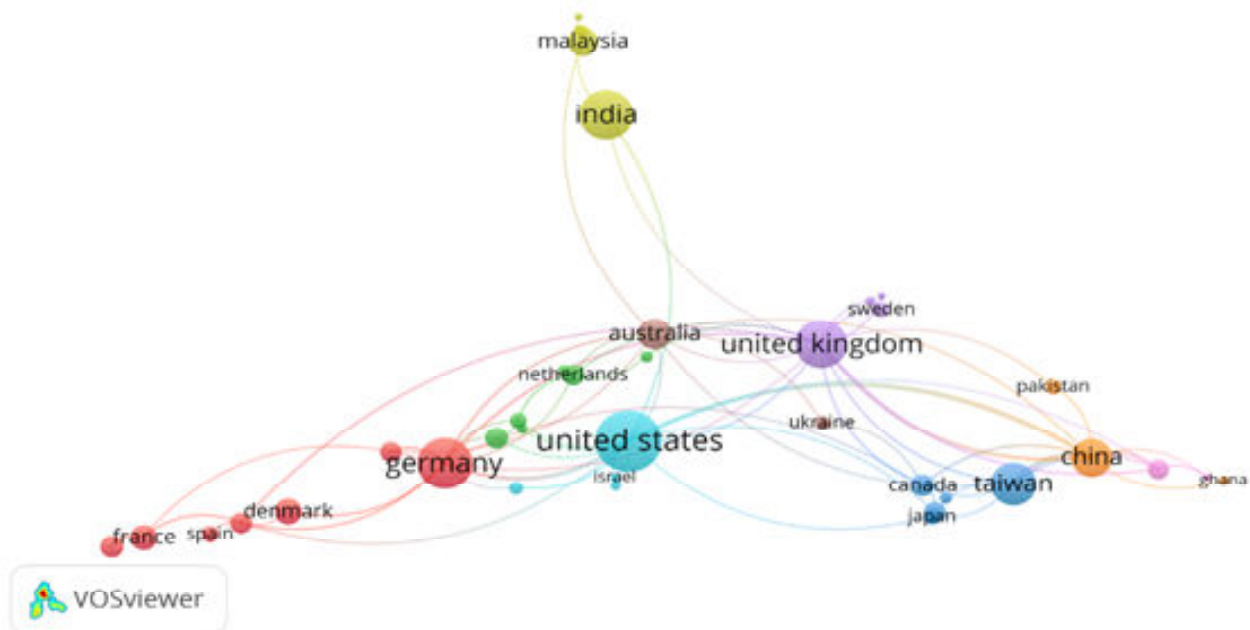
A total of 52 countries have contributed to the research on life insurance. The study found that the US, Germany, India, the UK, Taiwan, China, Australia, Malaysia, Denmark, and France are the top ten countries contributing the most to life insurance research. The US has secured first place in life insurance research contributions. The US, Germany, and India are the top three most contributing countries in life insurance research. Here, a rank analysis was conducted for the top 10 contributing countries. The US has 90 publications from 2001 to 2024. India has 55 publications in this period.

Table 3: Top Ten Countries with the highest number of Documents

Country	Documents	Total Link strength	Rank
United States	81	28	1
Germany	57	22	2
India	55	4	3
United Kingdom	52	31	4
Taiwan	42	18	5
China	33	32	6
Australia	24	10	7
Malaysia	19	4	8
Denmark	16	3	9
France	15	8	10

Source: Made by authors

According to Co-Authorship Analysis

Figure 3 :The distribution of Countries according to Co-Authorship Analysis

Source: Created by authors

The above figure shows clusters of contributing countries. The US (United States) is shown as the main cluster that shows the highest publications. The Germany cluster is the second-highest cluster, which shows the second largest publications. India is showing the 3rd largest cluster, which became the 3rd largest contributor in the life insurance publications. As the figure demonstrates, Sweden, Thailand, Turkey, and Hong Kong have the least strength in the contribution.

Countries like Germany, Hong Kong, China, Israel, South Africa, India the United Kingdom, South Korea, and Italy have strong connections with the United States. Countries like France and Italy are connected to Germany, which means their authors' collaborate for research on Life insurance. Egypt and South Africa authors collaborated with the Indian authors. Authors from Sweden and the UK collaborate for similar research work.

According to Citation Analysis

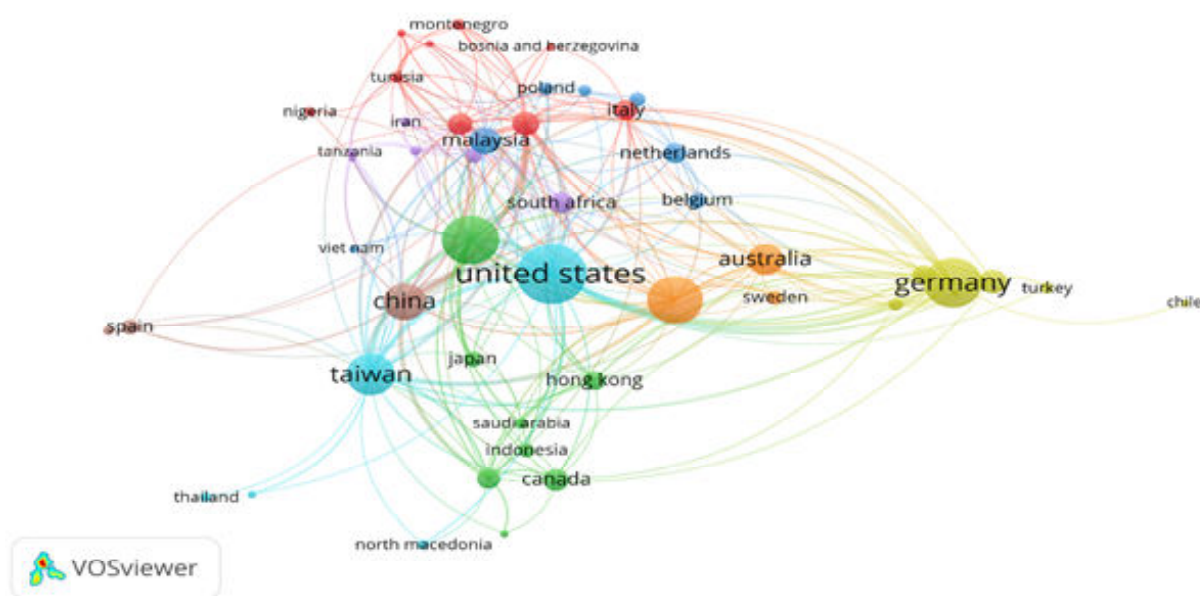
Data has been analyzed using citation analysis according to the most contributing countries. As shown in table and figure 4, the articles from the United States secured the highest number of citations, 2404. Taiwan secured 751 citations, the second-highest. China has the fewest citations among the top-ten countries contributing articles.

Table 4: Top Ten Countries with the highest Citation

Country Name	Citations	Rank
United States	2404	1
Taiwan	751	2
Germany	603	3
United Kingdom	491	4
India	388	5
France	382	6
South Korea	356	7
China	243	8
Denmark	233	9
China	243	10

Source: Made by authors

Figure 4: Distribution of Countries according to their Citation Weightage



Source: Created by authors

According to cluster Analysis of countries' contribution to their citation weightage, eight clusters are explicitly visible in figure 4. The first cluster includes nine countries Canada, Hong Kong, India, Indonesia, Japan Saudi Arabia, Singapore, South Korea, and Thailand. Canada, Taiwan, and India have citation Links. The second cluster includes nine countries: Albania, Bosnia and Herzegovina, Cameroon, France, Italy, Montenegro, Nigeria, Romania, and Tunisia. Cluster no. 8 is having least number of countries which is China, Mexico, and Spain.

Findings revealed that the US is the most contributing country according to all three types of analysis mentioned above. According to the document analysis, the US includes highest number of 81 documents, and according to co-authorship analysis, the US is showing the central cluster by linking other clusters. In the Citation analysis the US has a total of 2404 citations from 2001 to 2024.

Key Authors Contributing to the Life Insurance Research

Documents were analysed based on the authors' contribution to life Insurance research. Data has been analyzed in two parts. First part is the author's contribution according to the citation and another is the author's contribution according to documents related to life insurance.

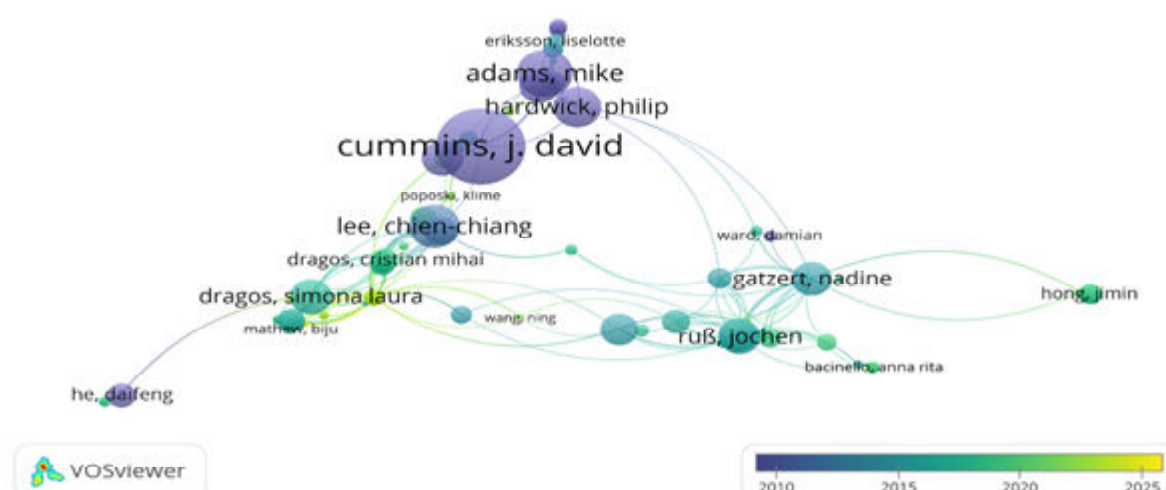
Table 5: Top Ten authors' Contribution

Authors	Documents	Citation	Total Strength link	Rank
Cummins, J David	2	411	15	1
Adams, Mike	8	176	16	2
Lee, Chien Chaing	3	148	17	3
Hardwick, Philip	5	134	14	4
Rub, Jochen	5	105	46	5
Dragos, Simona Laura	3	103	29	6
Chen, Mei-fang	2	102	1	7
Gatzert, Nadine	8	96	37	8
Zou, Hong	2	96	6	9
Kwak, Minsuk	3	93	6	10

Source: Made by authors

As shown in table 5, Cummins, J Davis secured the first rank in the citation with 411 citations for only two articles in the life insurance domain during 2001 to 2024. The second-highest citations are secured by Adams and Mike, with 176 citations for eight documents, and securing the highest link strength. In contrast, Kwak and Minsuk have the least, 93 citations for three articles in the top 10 citation contributing Authors.

Figure 5: Distribution of Authors according to their Citation Weightage (Minimum Citation=4)



Source: Created by authors

As shown in figure 5, Cumis J, Davis had the most citations before 2010. Similarly, Lee Chien had the highest number of citations between 2010 and 2015. Authors Rub and Jochen had the most citations between 2015 and 2020. Between 2020 and 2025, authors show limited citation counts.

Key Documents Contributing to Life Insurance According to Citations**Table 6: Top 10 Articles in life insurance with the highest citation**

Documents	Title	Citations
Brown & Goolsbee (2002)	Does the Internet make markets more competitive? Evidence from the life insurance industry))	404
Beck & Webb (2003)	Economic, demographic, and institutional determinants of life insurance consumption across countries	302
Chui & Kwok (2008)	National culture and life insurance consumption	189
Pliska & Ye (2007)	Optimal life insurance purchase and consumption/investment under uncertain lifetime	129
Quinn (2008)	The transformation of morals in markets: Death, benefits, and the exchange of life insurance policies	112
Tone & Sahoo (2005)	Evaluating cost efficiency and returns to scale in the Life Insurance Corporation of India using data envelopment analysis	105
Chen (2012)	How does the development of the life insurance market affect economic growth? Some international evidence	81
Outreville (2015)	The relationship between relative risk aversion and the level of education: A survey and implications for the demand for life insurance	79
Lee, Chen-Ying et al. (2015)	The relationship between attitude toward using and customer satisfaction with mobile application services: An empirical study from the life insurance industry	76
Bikker & van Levenstein (2008)	Competition and efficiency in the Dutch life insurance industry	73

Source: Made by authors

Brown and Goolsbee (2002) studied the internet competitiveness in life insurance markets. The paper deals with the main objective of checking how internet shopping affects the price of life insurance. Microdata of life insurance policies and individuals related to life insurance were used for the data analysis. The hedonic type regression analysis was used to understand the strength of the relationship between the internet usage and the price of life insurance. The study concluded that as usage of the internet increases, the price of life insurance decreases. This paper has the highest citation in the top ten contributing documents. Beck and Webb (2003) focused on studying the main influencers that affect life insurance consumption in different countries. The study found that economic indicators such as income, inflation rate, and banking sector developments are the main determinants of life insurance usage. The demographic determinants, such as education, young age dependency, and life expectancy, are the main indicators of life insurance usage. - This paper secured the second-highest citation in the top ten contributing documents. Chui and Kwok (2008) used an empirical study to fulfil the objective. Hofstede's cultural dimension is used to analyze the consumers' behavior according to their culture toward life insurance consumption. The study concluded that individualism has a significant impact on life insurance consumption, and power-distance and masculinity-femininity index have a negative impact on life insurance consumption. This paper has 189 citations, and it secured 3rd rank in most contributing documents. Pliska and Ye (2007) conducted research on optimal consumption of life insurance. Dynamic programming has been used for the analysis study concluded that the life insurance consumption routine is random. Because the person has initial wealth, he earns some money and uses it before his premature death. It secured 129 citations. Quinn (2008) studied the morals of transformation in death, life, and life insurance policies exchanges. To describe the secondary market the researcher adopted an institutional approach. The researcher used news, interviews, and

reports to get data about the market of life insurance. The study concluded that marketing morals in life insurance is an emergent topic in the economic society. This paper has a total of 112 citations.

According to a study entitled "Some International Evidences" conducted by Chen et al. (2012), concluded that the economic growth of a country is positively affected by life insurance. The researcher included circumstances like financial development, saving rates, interest rates, and social security, in which economic growth is possible. Outreville (2015) surveyed education level and relative risk-averse relationship argued that people with higher education are less risk averse, but it may also be argued that people with less risk aversion get higher education. The study concluded that the results have an important impact on microeconomic empirical studies. Bikker and van Leuven Steijn (2008) analyzed competition and efficiency in the Dutch life insurance industry by using supply and demand factors of the life insurance industry that show the existence of oligopoly in the country. Scale economies and cost X- inefficiencies turn out to be substantial.

Top Ten Sources Contributing to Life Insurance according to Citations

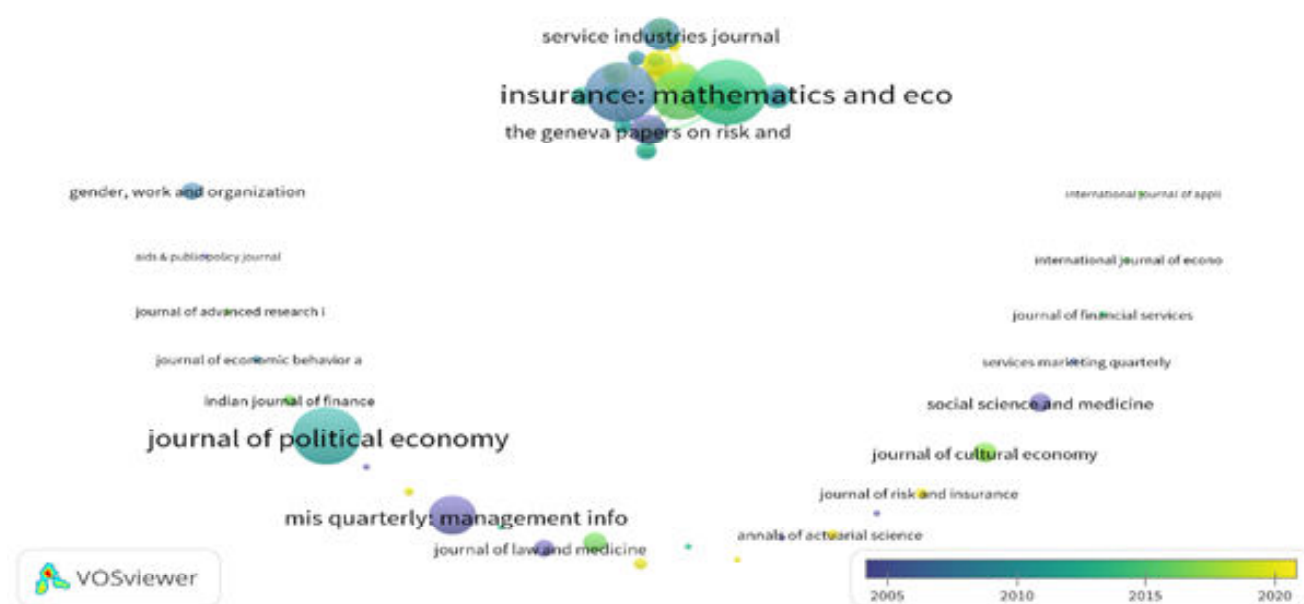
The researcher/s conducted an analysis based on the sources and their publications. According to Table 7, Insurance Mathematics and Economics has the highest citation and the highest strength link among other sources. The Journal of Banking and Finance has 449 citations and ranks second with a total strength link of 16.

Table 7: Top 10 Sources with the highest citation

Source	Documents	Citations	Total Strength link	Rank
Insurance Mathematics and Economics	36	537	54	1
Journal of Banking and Finance	7	449	16	2
Journal of Political Economy	2	416	0	3
Geneva papers on risk and insurance: MIS quarterly: Management information	28	315	37	4
Astin Bulletin	2	201	0	5
Service Industries Journal	4	133	9	6
The geneva papers on risk and industries	3	133	3	7
risks	2	116	5	8
Journal of Risk Finance	14	103	10	9
	4	99	9	10

Source: Made by authors

As shown in Table 7, the top ten sources were analyzed for getting the main contributing sources in the life insurance research from 2001 to 2024. Here, a total of 102 documents has the highest citation in the life insurance domain. The total citation is 2502 received by the top ten sources from 2001 to 2024. The Journal of Political Economy, Geneva Papers, and Management and Information secured 3rd, 4th, and 5th rank with 7, 2, and 28 documents having total citations of 416, 315, and 201. The Journal of Risk and Finance secured the last rank with a total of four documents having 99 citations and nine strength links.

Figure 6: Sources Distribution according to Citation (minimum citations=4)

Note: Created by authors

Figure 6 shows the network overlay visualization of publication sources in the life insurance domain. The figure demonstrates that the independent clusters of the Service Industries Journal, Insurance, The Geneva Papers on Risk and Insurance, Mathematics and Economics Journal are connected. To get an idea about the period of publication, with their source, different colors like purple, green, and yellow were used. Here, we can see that the Journal of Insurance, Mathematics, and Economics got maximum citations in the years between 2015 and 2020. Similarly, the Journal of Banking and Finance has most of the citations in the period between 2005 and 2010, whereas the Journal of Political Economy has most of the citations in the period between 2015 and 2020. The yellow colour shows recent publication sources with the Emerging themes.

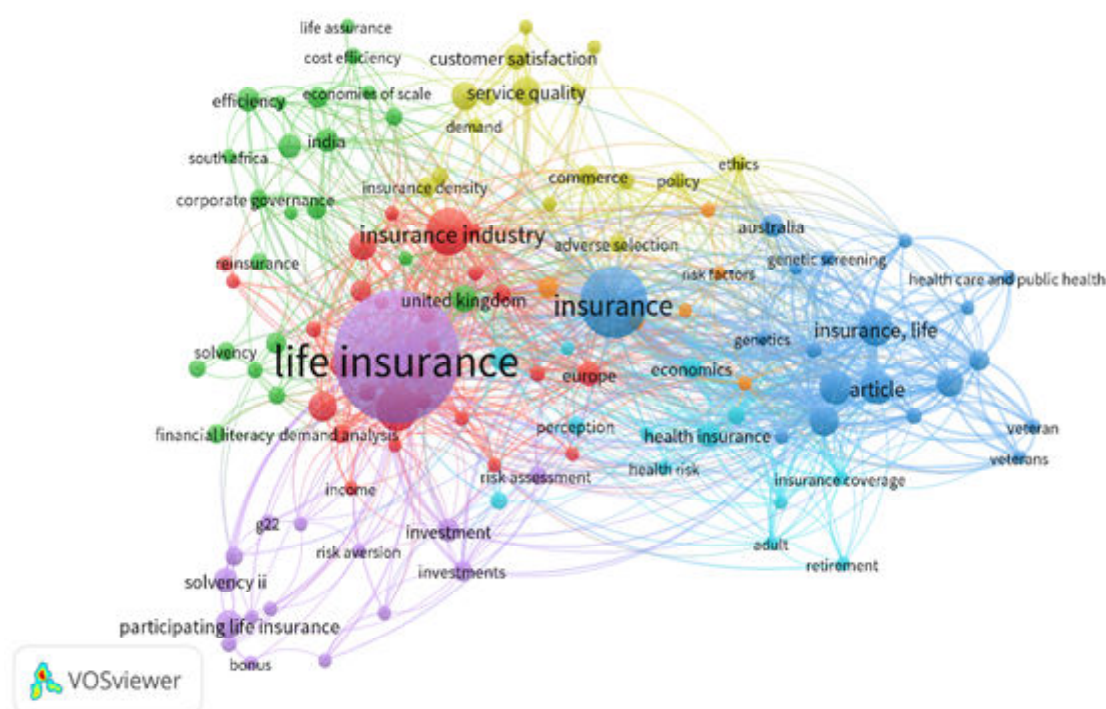
Analysis of Keywords Co-occurrence

Keywords play an important role in the title of a document. For finding the related literature, the keywords are important. The researcher/s analysed the top 15 keywords according to the co-occurrence analysis. It provides the growth and network or linkages between different keywords in the life insurance domain. As displayed in Table 8, the "Life Insurance" keyword was used 305 times from 2001 to 2024, with the highest link strength securing first rank. The keyword "Insurance" secured second rank with 89 co-occurrences and a total link strength of 230. The keywords "Insurance Industry", "Insurance system", and "Insurance, Life" secured third, fourth, and fifth rank with total link strength of 96, 98 and 148.

Table 8: Top-15 Keywords with the highest co-occurrence

Keywords	Co-occurrence	Total Link strength	Rank
Life Insurance	305	247	1
Insurance	89	230	2
Insurance industry	40	96	3
insurance system	37	98	4
insurance, life	25	148	5
article	22	122	6
human	22	140	7
humans	18	121	8
Life Insurance demand	17	24	9
service quality	16	19	10
participating life insurance	15	9	11
life insurance industry	15	12	12
economic growth	15	32	13
united states	15	75	14
Panel data	13	40	15

Note: Made by authors

Figure 7: Keywords Co-occurrence Network Visualization

Note: Created by authors

As displayed in Figure 7, a total of seven clusters were drawn by keywords co-occurrence. The first cluster is differentiated by different colors like purple, green, yellow, red, sky-blue, navy blue, and pista colors. The first cluster includes 14 words. Here, we can see that keywords like "life Insurance", "investment", "risk aversion", "risk assessment", and "participating life insurance" are involved in the first cluster. The second cluster includes 18 words like "insurance", "insurance, life", "humans", "healthcare and public health". The third cluster

consists of 17 words like "insurance industry", "insurance system", "economic development", "insurance market", "economic growth" etc. fourth cluster consists of 14 words like "customer satisfaction", "service quality", "demand", "policy", "ethics", "adverse selection", etc. 6th cluster include 20 words like "life insurance", "cost efficiency", "bancassurance" etc. The 7th cluster includes, a total of 14 words like "Economics", "perception", "Health insurance", "health insurance, etc.

Discussion of Results and Conclusion

This study was conducted to fulfil the research gap in life insurance bibliometric review. The study was undertaken by the authors based on data extracted on 1st October 2024. Firstly, the authors selected appropriate keywords related to life insurance, and then the data were extracted using the Scopus database. The first paper published on the subject of life insurance was in 1978. The authors selected a time frame of 2001 to 2024 for the study. The final data used for analysis included 511 articles for analysis after removing all the duplicates, as shown in the PRISMA diagram.

This study found that the publication trend is increasing year on year. In the year 2023, higher publication growth was found. The second objective was to find the countries that contribute the highest in the life insurance research. This objective was fulfilled by using three methods: first, using total documents produced by countries, second visualisation method using VOSviewer according to co-authorship analysis, and third, according to citation analysis. The study found that the US secured the first rank in life insurance research contribution according to document analysis, co-authorship analysis, and citation analysis. The third objective was to identify the key contributing authors in life insurance research. The study found that author Cummins J. Davis had the highest number of citations (411) and became the most reputed contributing author to life insurance research. The fourth objective set by the authors was to know the most contributing documents and sources in the life insurance domain. The study found the ten most contributing documents published from 2001 to 2015. The ten most contributing sources are Insurance Mathematics and Economics, Journal of Banking and Finance, Journal of Political Economy, Geneva Papers, Quarterly Management and Information, Asian Bulletin, Service Industries Journal, The Geneva Papers on Risk and Industries, Risk, and Journal of Risk Finance. The last objective was to check the keywords co-occurrence analysis to know the most used keywords by authors in life insurance research. Network Visualization map showed that keywords Life Insurance, Insurance Industry, Insurance system, insurance life, and human are the top-5 keywords used by different authors many times.

Further Scope of the Study

In this paper, the researcher/s conducted a study on only the life insurance topic. Future researchers can conduct research on the topic, like life insurance demand, the role of Insurtech in Insurance inclusion, policyholders' satisfaction level from life insurance, awareness about insurance, claim settlement, etc. Future researchers can use more than one database, such as Springer, Emerald, EBSCOhost, ProQuest, Google Scholar, etc.

Limitations of the Study

The author used only the Scopus database to get articles related to life insurance research. Other databases like Springer, Emerald, EBSCOhost, ProQuest, and Google Scholar are not used for the data extraction process. Only 511 articles were included in the study. The authors excluded the articles before 2001, which is one of the limitations of this study.

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