

Emergence and Development of Insurtech: Systemization through Bibliometric Analysis

Durgesh Yadav

Research Scholar, Department of Commerce, University of Lucknow, Lucknow, India
durgeshyadav512@gmail.com

Prof. Ram Milan

Head, Department of Commerce, University of Lucknow, Lucknow, India
milanlko@rediffmail.com

Abstract

The combination of technology in the insurance sector, referred to as Insurtech, has transformed traditional insurance operations by enhancing customer experience, increasing efficiency, and enabling innovative business models. Early research focused on the potential of digital platforms, data analytics, and artificial intelligence in reshaping insurance practices, while more recent studies delve into blockchain, machine learning, and the big data. These technologies are enabling personalized insurance products, real-time risk assessment, and automation in claims processing, fundamentally altering traditional insurance paradigms. This paper aims to explore the emergence and development of Insurtech through a bibliometric analysis, offering a systematic overview of its academic and practical evolution. By examining a large corpus of scholarly articles, conference proceedings, and industry reports, this study traces key research trends, dominant thematic areas, influential authors, and significant publications shaping the Insurtech landscape. This paper provides the summary statistics on journals covering the topic, authors, year of publication, size, methods, and applications of Insurtech elaborated. The study is based on the bibliometric analysis of 348 papers extracted from the Scopus database.

Keywords: Bibliometric analysis, financial technologies, Insurance, Insurance technologies, Literature review

1. INTRODUCTION

Every human is permeated by technology and the innovation it enables. Since customers have grown accustomed to conducting financial transactions and managing their lives using the internet and mobile devices, they want the same digital experience with insurance. The integration of the financial infrastructure should lead to cost reductions and create a more efficient financial market [1]. Any internal control system must be adaptive to changes in the business, operational environment and regulatory framework to meet new and fast changing business models [2]. The change in insurance's digital experience is merely a portion of the revolution brought about by InsurTech. "Data science," "big data," and "AI" (including machine learning methods such as deep learning) began as buzzwords in actuarial science. The concept of exploiting non-traditional data and sophisticated analytics is now widely accepted and viewed as a necessary component of InsurTech. InsurTech incorporates cutting-edge hardware, software, and user interfaces to address inefficiencies or opportunities in the insurance value chain, which frequently includes technology, data, and analytics [3]. InsurTech targets the evolution/disruption of: - (a) the interaction between insurers and their customers; (b) the automation of processes; and (c) the modification of old or creation of new insurance products [3]. Through the term "InsurTech" is frequently used in conjunction with "InsurTech startups," it encompasses much more; it may refer to an "ecosystem of focused, innovation-driven enterprises." [4]. By defining InsurTech as the intersection of industry specificity and maturity, we can provide a context for the concept [5]. At one end of the industry specificity spectrum, technology solutions can be deployed broadly across different industries, whereas, at the other end, there is a focus on a single insurance product. We observe businesses in terms of maturity ranging from startups to established enterprises that have offered or used technology solutions for decades. Despite the recent global emergence and application of the InsurTech industry, the literature on InsurTech's bibliometrics is underexplored both theoretically and empirically. Therefore, we aim to present a comprehensive bibliometric analysis of the current state of research on insurance technology, InsurTech, indexes in Scopus. In particular, we analyse bibliometric features based on publishing year and yearly growth, document type, source type, document language, subject area, keyword analysis, country productivity, authorship, active institution, and citation analysis for InsurTech research. From the study's findings, we ascertain the current state of academic study in this dimension, which

can provide the direction for further research. Researchers interested in conducting studies in this discipline can determine which themes have received the most attention and which countries/country groups were used as case studies. This will enable researchers to identify critical themes and gaps in the literature.

The paper comprises of 6 Sections. Section 1 is all about the Introduction. Section 2 describes the emergence and development of the recent InsurTech industry. Section 3 discusses the review works on bibliometric investigations in various fields. Section 4 discusses the methodology and data collection for the study. Section 5 presents the findings from the data. Section 6 summarizes the findings with recommendations for future research.

2. THE EMERGENCE AND DEVELOPMENT OF INSURTECH

The emergence of the modern insurance can be traced backed to the late 17th century (Pearson, 1997). Last but not the least, the insurance industry is heavily bureaucratic by the nature. It t seems to be among the most stringently regulated industry branches in the world (Marano, 2017; Liu et al., 2019), and the regulation has been in force for over two centuries. (Pearson, 2002). To comprehend the evolution of InsurTech, it is significant to first examine the inception of FinTech. Initially, InsurTech was considered as a subset of FinTech until activities inside the insurance business were prominent and distinct enough to be make it as a separate “category” from FinTech. FinTech was earliest and most well-known members of “EverythingTech” – a family of “-Tech” terms that evolved on the internet [6]. It is a combination of the words “Financial” and “Technology” and refers to the boom in financial services technology innovation that began in the early 2000s and acquired considerable traction till present. According to Global InsurTech Report’2023, advent of InsurTech followed a similar pattern with total InsurTech funding and deal count from 2012 to 2023.

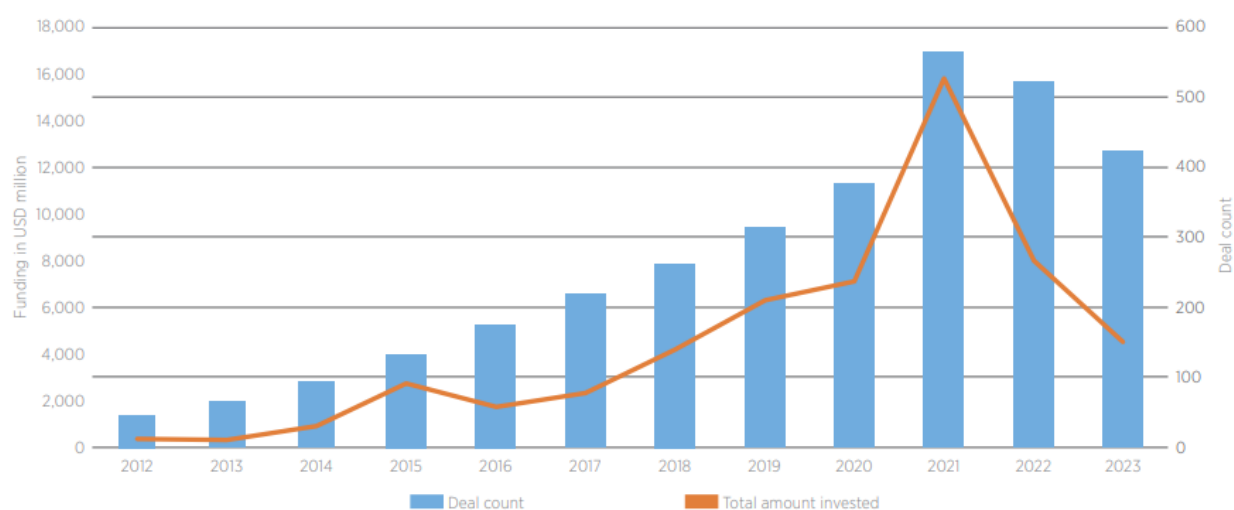


Fig.1: Total InsurTech Funding and Deal count till 2023

3. LITERATURE REVIEW

The rise in competition at the insurance market and consequent decline in profit margins (BorelMathurin et al, 2018) has positioned technological change as a paramount strategic factor for all insurance companies worldwide. Practitioners, however, are not unequivocal on whether this transformation is a piecemeal and uncoordinated by nature, or the part of the large-scale disruptive transformation process. On one side, voices are raised on the slow transformation capacities of insurers, positing that “regulation, product complexity and insurers’ large balance sheets” keep digital attacks away (Catlin and Lorenz, 2017). Accordingly, the broad digital conversion in the insurance sector has come rather too late (Müller et al, 2016). Contrarily , a number of industry reports are not questioning “ifs”, but “hows and whens” of broad digitalization (McKinsey, 2018). Among others, the cacophony in the aforementioned practice and industry-related reports has affected scholarly contributions in the digitalization of insurance. Simple browsing through the main article collections leaves a relative paucity of evidence on insurance-wide technology changes. This is to some extent expected, as the phenomenon of insurtech is evidently multifaceted. Not only that this phenomenon covers actuarial and technological aspect, but spread

across economics, strategy, marketing, regulation, implementation in various field (in both life and non-life insurance). Although scarce, concurrent research offers some evidence on the modern technologies uses in insurance business. Certainly, There is a noticeable intensification of of digital platforms and mobile applications in creating and providing new, personalized solutions and services (Stoeckli, Dremel and Uebernickel, 2018) and innovating customer relationship management (Bazini and Madani, 2015). In technological advances in big data and complex data analytics, insurance companies have recognized the opportunity for better revenue forecasting (Fang, Jiang and Song, 2016), innovating their business models in terms of more efficient identification and risk reduction, more accurate market segmentation and fraud prevention. The data collection and processing has been substantially changed with IoT based solution and social networks which opens an avenue for more precise and diligent setup of premiums and risk mitigation (Rumson and Hallett, 2019). These advanced sources of digital data enrich the insight into customers' behavior, allowing insurers to develop tailor-made approach to risk assessment and to personalize insurance products. The emergence of big data technology can significantly contribute to automation of insurance processes, but also rises ever-growing concerns regarding privacy and data protection (Keller, Eling and Schmeiser, 2018). Another disruption in insurance industry has been made with blockchain technology. This distributedledger technology has made significant changes in other industries (international payments, transportation and supply chains, and digital identification) and slowly but steadily has been infiltrating in insurance operations – such as health insurance (Zhou, Wang and Sun, 2018) or cyber-insurance (Lepoint, Ciocarlie and Eldefrawy, 2018). The most prominent advancement in blockchain use in insurance is related to “smart contracts” in the automation of procedures for resolving claims and the entire process of insurance policy administration. Following the wave of tech-based disruptive innovations in other industries, traditional insurance companies strive to integrate machine learning, deep learning, chatbots, robo-advisors and other solutions based on artificial intelligence across the whole value chain. Perhaps the most illustrative description of disruptive potential of AI-based solutions (i.e. machine learning, deep learning, chatbots and robo-advisors) in insurance sector can be found in McKinsey study “Insurance 2030 – The impact of AI on the future of insurance”. The authors strongly states that artificial intelligence will “shift insurance from its current state of “detect and repair” to “predict and prevent,” transforming every aspect of the industry in the process (McKinsey, 2018).

4. METHODOLOGY

Bibliometric analysis comprehensively assesses publications on a given subject or area from a quantitative, objective standpoint [7–10]. Bibliometric analysis aims to evaluate studies' quantifiable methodologies in light of their qualitative categories [11]. Bibliometric studies are recognized as a significant tool for evaluating studies in the social sciences. They enable the description of the dynamics and direction of publications in developing research fields and the evolution a field through time [12].

The data for this study are from the Scopus database as of April 21, 2022. The following keywords are used to find relevant articles on InsurTech: **"InsurTech" or "insurance technology" or "insurance technologies" or "technology insurance" or "technologies insurance" or "internet insurance" or "internet insurances" or "insurance big data" or "insurances big data"**. We concentrate on papers' titles, keywords and abstracts because they convey important information about the research area and the study's objectives. Chen [13] reveals that a paper's title should include information that could draw readers' interest, because it is the first point that readers will notice. A total of 348 papers were retrieved in response to the query, allowing us to undertake a bibliometric analysis. There are several tools accessible for a bibliometric analysis. We used

- I. Microsoft Excel to calculate the frequencies of published materials and to design the corresponding chart and graph; and
- II. VOSviewer and the R package to build and display bibliometric networks.

VOSviewer and the R package facilitate the visualisation of bibliometric data, mapping, and establishing relationships between pertinent objects [14]. We use VOSviewer and R package to analyse citations and the co-occurrence the keywords of author(s) to link and map relevant author(s).

To create bibliographic maps and networks, we first download the complete records of all relevant papers with the selected keywords from the Scopus database. We then use VOSviewer and the R package to process the raw data. The application generates network visualizations in which a circling representation of a label represents elements. Each label and circle in

the network have a size that corresponds to its weight in relation to other elements. The lines on the network map indicate the connections between important articles. Distances between items represent the strength of their associations; shorter distances indicate the strength of the interactions. Additionally, the circles are colored to correspond to the clusters into which the relevant objects are sorted. **Table 1** presents the methodology's fundamental steps.

Table 1: Bibliometric Analysis Framework

Description	Result
Database	Scopus
Search period	1978-2024
Publication type	Article, Conference paper, Book, Book chapters
Search Field	Title, Keyword, Abstract
Search String	<i>"InsurTech" or "insurance technology" or "insurance technologies" or "technology insurance" or "technologies insurance" or "internet insurance" or "internet insurances" or "insurance big data" or "insurances big data"</i>
Search Result	348

5. RESULTS

Using the Scopus database, we analyse the bibliometric features of publishing year and yearly growth, document and source type, document language, subject area, keyword analysis, country productivity, authorship, active institution, and citation analysis. The results are presented in frequency and percentage form. We use VOSviewer to map the co-occurrence of the authors' keywords and report citation analysis as citation metrics and the top 10 most referenced articles on InsurTech.

5.1 Publications by Year

The first paper on InsurTech by Gutzwiller [15] examined whether insurance companies should finance a low-cost programme (technology) as part of their policies. There has been very little growth in the number of publications devoted to InsurTech, and for several years, there was just that one paper related to the subject until InsurTech gained popularity in 2017. Since then, the annual number of publications on InsurTech has grown substantially. Table 2 summarizes the number of publications, percentages, cumulative percentages, and growth percentages of InsurTech papers. Table 2 and Figure 5 show that the greatest number of papers, so far, on InsurTech was in 2023, 56 publications, about a quarter of total paper on InsurTech. The number of publications in 2024 is 54, as industry revolution 4.0 is happening widely. The application of technology in the financial services industry during the Covid-19 pandemic significantly impacted the insurance business. As a result, insurance players started implementing business continuity plans to preserve the supply of core insurance functions, emphasizing the delivery of digital services [16-17].

Table 2: Publications by year and the annual growth of InsurTech subject

Year	No. of publication	Percentage	Cumulative Percentage	Growth
1978	1	0.29%	0.29%	0.00%
1986	1	0.29%	0.57%	0.00%
1996	1	0.29%	0.86%	0.00%
1997	1	0.29%	1.15%	0.00%
1998	1	0.29%	1.44%	0.00%
1999	1	0.29%	1.72%	0.00%
2002	1	0.29%	2.01%	0.00%
2003	7	2.01%	4.02%	600.00%
2005	1	0.29%	4.31%	-85.71%

2007	4	1.15%	5.46%	300.00%
2008	3	0.86%	6.32%	-25.00%
2009	3	0.86%	7.18%	0.00%
2010	4	1.15%	8.33%	33.33%
2011	5	1.44%	9.77%	25.00%
2012	2	0.57%	10.34%	-60.00%
2013	3	0.86%	11.21%	50.00%
2014	3	0.86%	12.07%	0.00%
2015	1	0.29%	12.36%	-66.67%
2016	2	0.57%	12.93%	100.00%
2017	9	2.59%	15.52%	350.00%
2018	19	5.46%	20.98%	111.11%
2019	15	4.31%	25.29%	-21.05%
2020	44	12.64%	37.93%	193.33%
2021	54	15.52%	53.45%	22.73%
2022	53	15.23%	68.68%	-1.85%
2023	56	16.09%	84.77%	5.66%
2024	54	15.23%	100.00%	-5.36%
Total	348	100%		

5.2 Documents by Source and Type

We analyzed the documents extracted from the Scopus database using the document type, source type, and source title. Document type can be a published paper, a conference paper, a review, a book, a book chapter, an editorial or other. Figure 5 summarizes the document type analysis. Published papers account for over half (52.30%) of InsurTech papers, followed by conference papers (22.41%), and books and book chapters (16.95%).

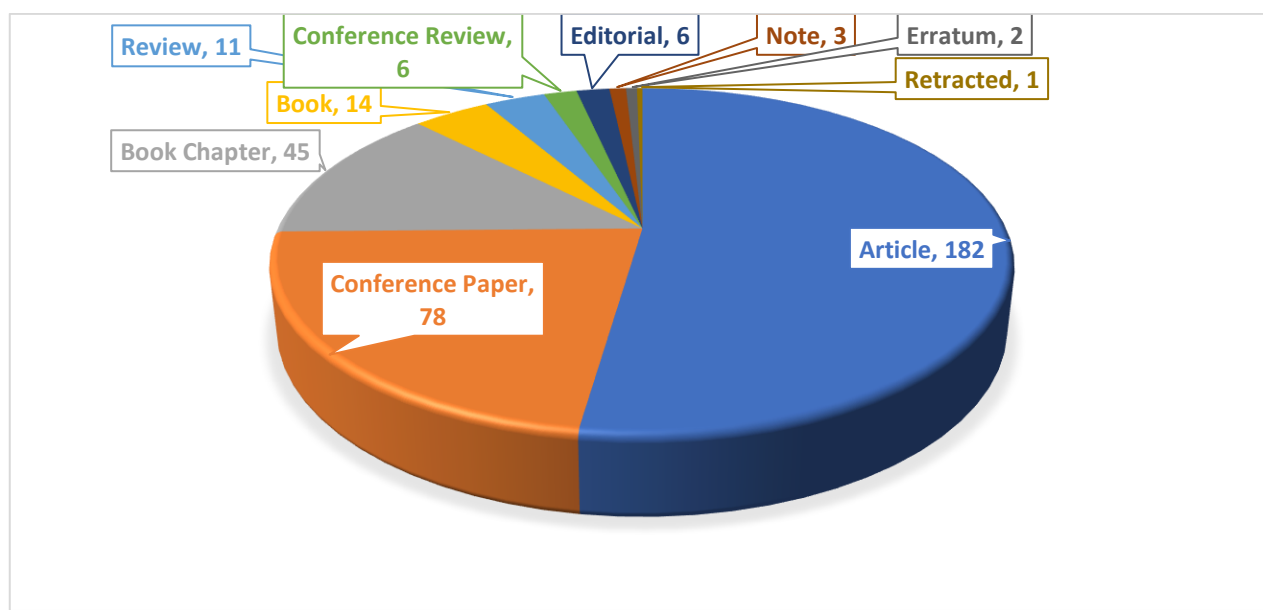


Fig. 2. The distribution of type of published paper on InsurTech

Although there are many different types of published paper on InsurTech, several source-type categories can be identified. Table 3 shows the published journals with total citations according to source type.

Table 3: InsurTech papers by source type

Source Type	No. of Published Documents	Percentage	Total Citations by Source Type	Percentage
Article	182	52.30%	2,649	71.61%
Conference Paper	78	22.41%	593	16.03%
Book Chapter	5	12.93%	155	4.19%
Book	14	4.02%	78	2.11%
Review	11	3.16%	154	4.16%
Conference Review	6	1.72%	00	--
Editorial	6	1.72%	65	1.76%
Note	3	0.86%	1	0.03%
Erratum	2	0.57%	1	0.03%
Retracted	1	0.29%	3	0.08%
Total	348	100%	3,699	100%

Source: Data extracted and computed from Scopus Database

Table 4 lists the top 5 papers based on each source type and their number of citations. The top-cited journal article is ‘An ensemble random forest algorithm for insurance big data analysis’ by Lin, Weiwe; Wu, Ziming; Lin, Longxin; Wen, Angzhan [18]. Here, the authors apply a heuristic bootstrap sampling method combined with an ensemble learning algorithm to large-scale insurance business data mining. The conference paper titled as ‘Secure or insure? a game-theoretic analysis of information security games’ by Grossklags, Jens.; Christin, Nicolas.; Chuang, John is the most cited article from of the 17th International Conference on World Wide Web 2008(ICWWW)[23]. A Review by Lee, Hyeok-Hee which is titled as “Korea heart disease fact sheet 2020: Analysis of nationwide data” is the most cited source under book, book chapters and trade publications. All top five data type with their citations are mentioned in the following table.

Table 4: The top 10 InsurTech papers by source type and total citations

Source Type	Authors	Title	Citations
Published Papers	Lin et al,[18]	An ensemble random forest algorithm for insurance big data analysis	233
	Marsal-Llacuna et al,[19]	Future living framework: Is blockchain the next enabling network?	139
	Wing et al,[20]	New insights into US flood vulnerability revealed from flood insurance big data	118
	Stoeckli et al, [21]	Exploring characteristics and transformational capabilities of InsurTech innovations to understand insurance value creation in a digital world	110
	Kim et al, [22]	Korea hypertension fact sheet 2020: analysis of nationwide population-based data	81
Conference papers	Jens Jet al, [23]	Secure or insure? a game-theoretic analysis of information security games	178
	Ye et al, [24]	DCDIR: A Deep Cross-Domain Recommendation System for Cold Start Users in Insurance Domain	43
	Neal et al, [25]	Blue versus red: Towards a model of distributed security attacks	42
	Styer A.K et al, [26]	Factors associated with the use of elective single-embryo transfer and pregnancy outcomes in the United States, 2004–2012	30

	Sumit et al, [27]	Proactive fintech: Using intelligent IoT to deliver positive InsurTech feedback	29
Book, Book Chapters, Review	Hyeok-Hee et al, [28]	Korea heart disease fact sheet 2020: Analysis of nationwide data	64
	Tan Choon et al, [29]	InsurTech and FinTech: Banking and Insurance Enablement	49
	Cappiello et al, [30]	Technology and the insurance industry: Re-configuring the competitive landscape	38
	Geeta Patel [31]	Imagining risk, care and security: Insurance and fantasy	31
	Haitham et al, [32]	A Bibliometric Review of Big Data in Finance	30

Source: Data extracted and computed from Scopus Database

Table 5: Language used in the publications of Insurtech papers

Language	No. of published Papers	Percentage
English	331	95.11
Chinese	7	2.01
German	3	0.86
Russian	2	0.57
Portuguese	1	0.29
Italian	1	0.29
Spanish	1	0.29
Korean	1	0.29
Persian	1	0.29
Total	348	

Source: Data extracted and computed from Scopus Database

Table 5 provides a breakdown of the languages used in Insurtech paper publications, extracted from the Scopus Database. English is the dominant language for publishing Insurtech papers, accounting for 331 papers or 95.11% of the total. This indicates a strong preference for English in the global academic and research community. Chinese comes in second, with 7 papers or 2.01%, though its contribution is much smaller than English. German follows with 3 papers (0.86%), and Russian with 2 papers (0.57%). Portuguese, Italian, Spanish, Korean, and Persian each have only 1 paper published (0.29% each).

Subject Area	No. of published *	Percentage
Business, Management and accounting	135	19.48%
Computer Science	120	17.32%
Economics, Econometrics, and Finance	116	16.74%
Social Science	72	10.39%
Engineering	61	8.80%
Decision Science	44	6.35%
Medicine	33	4.76%
Mathematics	22	3.17%
Environmental Science	19	2.74%
Art and humanities	12	1.73%
Earth and planetary Science	11	1.59%

in a research area. We use VOSviewer to further analyse author(s)'s keywords for co-occurrence. VOSviewer is a software application that assists in the construction and visualisation of bibliometric networks. Figure 4 aids in identifying a network visualization of the authors' keywords, where the color, circle size, font size, and thickness of the connecting lines indicate the strength of the associations between the keywords. Frequently, related keywords are listed together, as shown by the same colour. For instance, the graphic implies that the red terms insurance market, game theory and financial market, are tightly related and frequently co-occur.

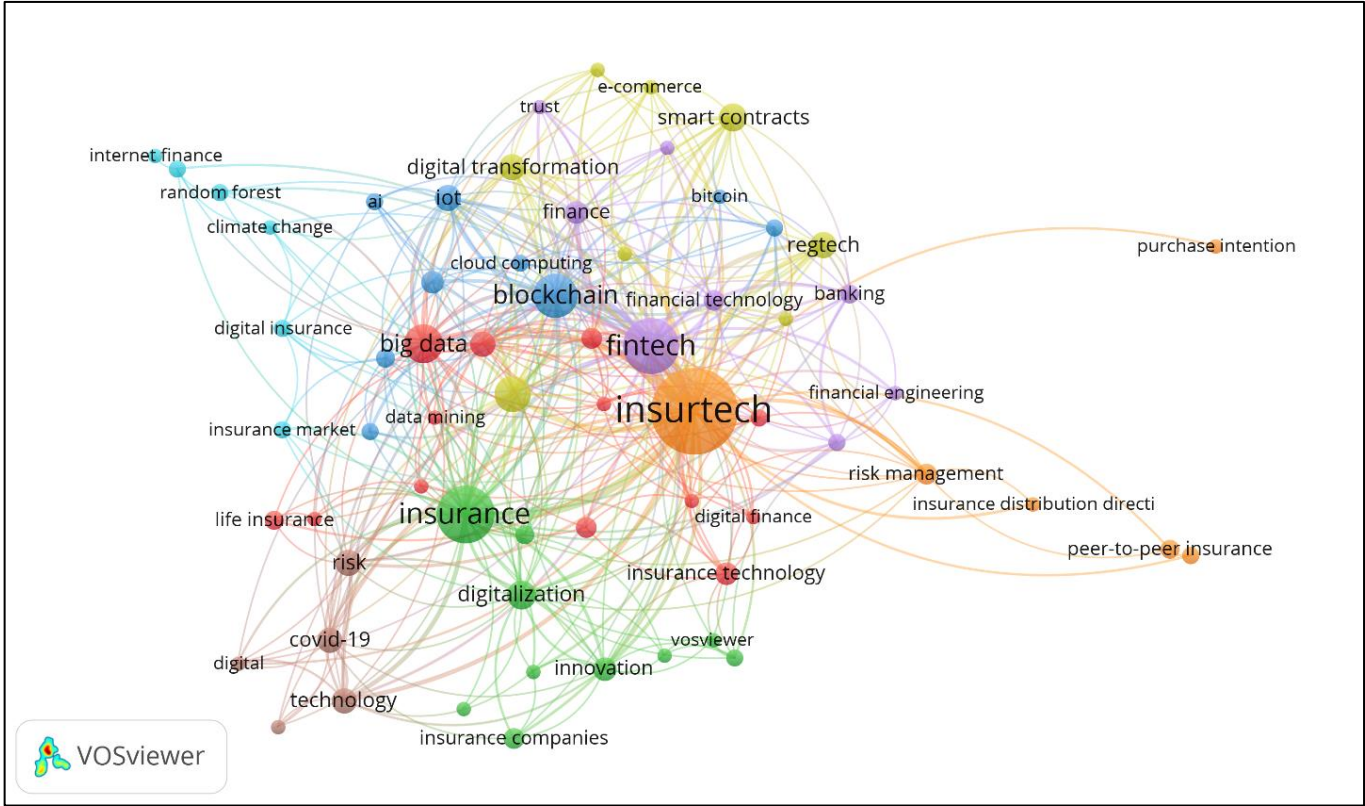


Figure 4: Co-occurrence analysis of Author(s)'s Keywords

Keyword co-occurrence analysis examines the connections between terms that appear together in numerous documents, measuring the strength of their association. [37]. The analysis of keyword co-occurrence relies on counting how often pairs of keywords are mentioned in the same document. In this study, 960 keywords were identified. All the keywords extracted from the database of InsurTech papers were examined to give a clear overview. The five keywords that shows highest occurrence ratio (OR) and total link strength (TLS) are: Insurtech (OR = 112; TLS = 227), insurance (OR = 52; TLS = 137), fintech (OR = 49; TLS = 152), blockchain (OR = 30; TLS = 104), and big data (OR = 23; TLS = 64).

Table 7 Describes the primary keywords and their features based on co-occurrence and total link strength within the network. The size of the nodes (height of the element on the network) and the font size of the keyword names reflect the frequency with which each term appears. The largest cluster identified by VOSviewer is focused on InsurTech-related topics. (see Table 7).

Cluster	No. of Keywords	Main Keyword	Maximum no. of Co-occurrence Keyword	Maximum Link strength of Keyword	Other Top 3 Keyword
7	6	InsurTech	112	227	Risk management
					Peer-to-peer insurance
					Risk sharing
2	10	Insurance	52	137	Digitalization
					Innovation

					Insurance companies
5	8	Fintech	49	152	Finance
					Financial technology
					Banking
3	9	blockchain	30	104	Internet of Things
					Insurance industry
					Digital technologies
1	13	Big data	23	64	Machine learning
					Insurance technology
					Health insurance

Table 7: The top 4 most frequent keywords in InsurTech publications and co-occurrences

Source: Data extracted and computed from Scopus Database

Table 7 summarizes the most frequent keywords found in InsurTech publications, highlighting the main keyword for each cluster along with its co-occurring keywords and their link strength. The cluster centered around **InsurTech** (Cluster 7) shows the highest co-occurrence and link strength, with related terms such as risk management and peer-to-peer insurance. **Insurance** (Cluster 2) also features prominently, linked with digitalization and innovation. **Fintech** (Cluster 5) is closely tied to finance and banking, while **Blockchain** (Cluster 3) is associated with technologies like the Internet of Things and digital solutions. Lastly, **Big Data** (Cluster 1) is connected with emerging technologies such as machine learning and insurance technology. Each cluster reveals key themes and relationships driving the evolving InsurTech landscape.

5.4 Authorship and Author Co-Occurrence

Table 8 shows the number of authors of each paper: 76 (21.84%) of the documents are single authored. There are 9 (2.59%) documents for which the author's name(s) is(are) unavailable or cannot be located in data extracted. The remainder, 263 (75.57%), are multi-authored publications with the number of authors ranging from two to 40.

Table 8: Number of Author(s) per publication on Insurtech

Author Count	Frequency	Percentage
0	9	2.59
1	76	21.84
2	96	27.59
3	71	20.40
4	44	12.64
5	19	5.46
6	12	3.45
7	9	2.59
8	4	1.15
9	1	0.29
>10	7	2.01
Total	348	

Source: Data extracted and computed from Scopus Database

Figure 5 shows the co-authorship analysis and intellectual structure of InsurTech impact. The size of each cluster indicates the degree to which writers are co-authors and the width of the lines indicates the intensity of the co-authorship interactions.

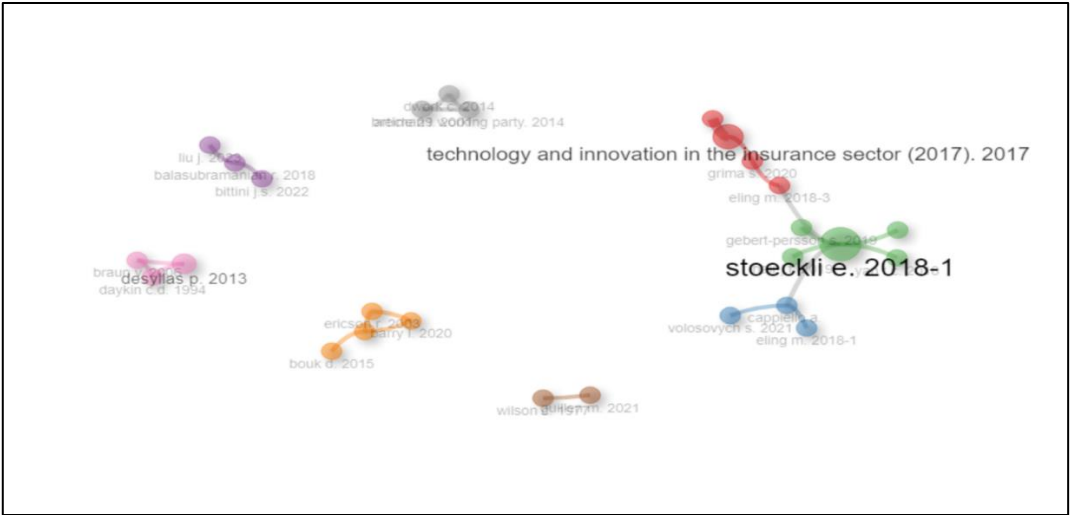


Figure 5: Co-authorship analysis of papers on InsurTech

Figure 5 illustrates a co-authorship analysis of papers on InsurTech, depicting the collaborative relationships between researchers. Each cluster of connected nodes represents groups of authors who have co-authored papers in this field. The size of the names and nodes may indicate the frequency or prominence of the papers, with larger nodes or names (e.g., **stoeckli e. 2018-1**) suggesting influential authors or highly cited works. The spatial separation of clusters suggests distinct groups of researchers working on different themes within InsurTech, with notable clusters such as the one related to **technology and innovation in the insurance sector (2017)**. Overall, this visualization highlights the collaborative structure within InsurTech research, with certain authors or papers acting as key hubs in the network.

5.5 Citation analysis

Researchers' productivity can also be quantified by the number of citations and average citations per year. Table 9 summarizes the citation metrics for the publications retrieved. The table displays the overall number of citations for all retrieved publications and the average number of citations per year. The data in Table 11 show 3699 citations registered over 47 years (1978 – 2024) for 348 retrieved publications, with an average of 78.70 citations/year.

Table 9: Citation matrices from InsurTech publication

Metric	Data
Publication Years	1976-2024
Citation Years	47
Paper	348
Citations	3699
Cites/Year	78.70
Cites/Paper	10.62
Cites/Authors	3.49

Source: Data extracted and computed from Scopus Database

5.6 Word frequency analysis

A Treemap is a visualization technique used to represent hierarchical data using nested rectangles. Each rectangle (or "tile") represents a data point, and the size of the rectangle reflects the magnitude or frequency of that point in relation to the whole dataset. As per figure 6 and table 10, "Insurance" is the most frequent word, accounting for 12% of the total,

followed by terms like "InsurTech" (5%) and "Human" (4%). Other frequently appearing words include "Insurance industry," "Big Data," "Blockchain," and "Risk management" (each contributing 3%). The treemap also highlights the importance of emerging technologies such as "Artificial intelligence," "Internet of Things," and "Fintech," along with demographic factors like "Aged" and "Female." This visualization provides insights into key research themes and trends in the InsurTech field, indicating a strong focus on technological innovations, insurance sector dynamics, and human factors.

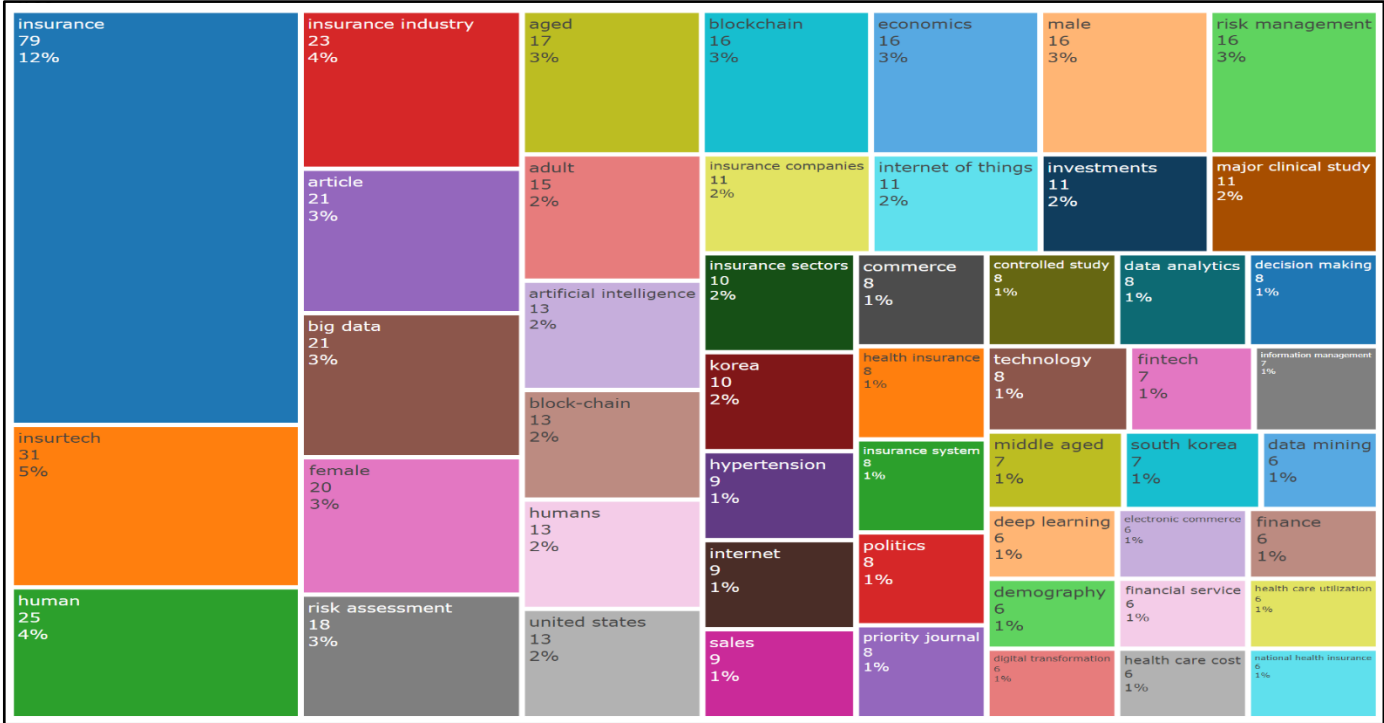


Figure 6: Word frequency through TreeMap

Table 10: Top five word with highest Frequency

Word	Frequency	Percentage (approx.)
Insurance	79	12%
InsurTech	31	5%
Human	25	4%
Insurance Industry	23	4%
Article	21	3%

Source: Data extracted and computed from Scopus Database

5.7 Country’s Collaboration Network Analysis

A Country’s Collaboration Network Analysis typically examines the relationships between countries based on co-authorship or collaborative research in a specific field, such as InsurTech. This type of analysis helps identify which countries are collaborating the most frequently on scientific publications, how they are connected, and the strength of their collaboration. This type of network analysis helps visualize the global research landscape, identifying major players and collaboration patterns in specific scientific fields like InsurTech.

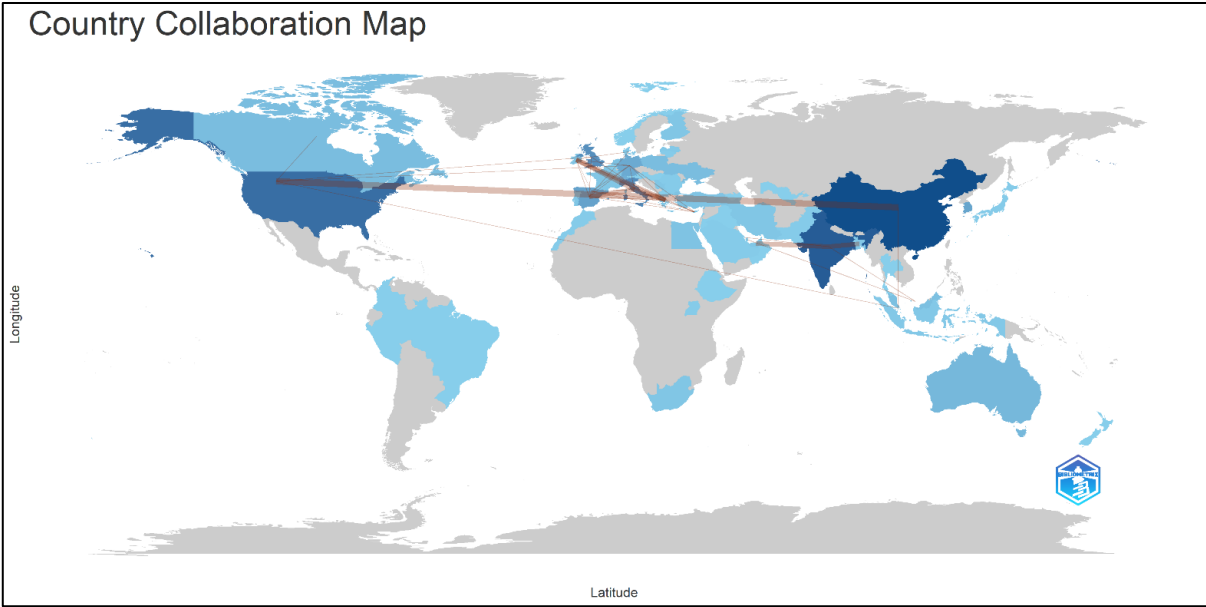


Figure 7: Country’ Collaboration world Map on the Topic “InsurTech”

Table 11: Top 5 Country Collaboration on the publication on ‘InsurTech’

Countries		Frequency
From	To	
China	USA	4
India	Bangladesh	3
India	United Arab Emirates	3
Ireland	Greece	3
Italy	Greece	3

Source: Data extracted and computed from Scopus Database

The table 11 and figure 7 highlights the top 5 country collaborations in InsurTech-related publications. China and the USA have the most frequent collaboration, with a total of four joint publications. India is involved in two separate collaborations, with Bangladesh and the United Arab Emirates, each resulting in three publications. Additionally, Ireland and Italy have both collaborated with Greece, also with three publications each. This data suggests that China-USA and India’s partnerships with other countries, particularly in emerging markets like Bangladesh and the UAE, are significant contributors to the global InsurTech research landscape.

6. CONCLUSION

We reviewed all scholarly papers on InsurTech indexed with Scopus database. We report the trends of past studies in the Scopus database using selected bibliometric indicators. That database was used to extract bibliometric information for 348 papers. According to the findings, the study of InsurTech has grown since 2017 and is to grown significantly more by 2022. Most papers were published in academic journals and English is the primary language. Through 21.84% of papers are single-authored, the remaining 75.57%, had two or more authors. The data also demonstrate that the number of authors per paper is increasing with time. Noticeable contributions to scholarly publications on InsurTech is made by Asian countries. InsurTech research topics are primarily derived from business, management, accounting, computer science and economics, econometrics, and finance. Other academic fields, such as social sciences, engineering, decision sciences, and mathematics, are also interested in the topic. Here, number of publications was increasing every year, our analysis shows an increase in the average number of authors per paper. To some extent, this trend indicates more collaboration among authors in the field. Our findings indicate that the impact of InsurTech on the financial performance of insurance companies and other entities such as insurance brokers, loss adjusters and insurance agents has not been discussed. The analysis of keyword occurrence and paper citations shows that the topic of insurance contracts can be classified as a developing topic

to be explored. Therefore, there is potential for future study in this area. InsurTech also plays a role in the development of new insurance contracts. For example, it can be used to create more user-friendly contracts or ones that offer more flexibility. InsurTech could also unite with RegTech to help insurers manage their insurance contracts more effectively. In addition, the requirements of theoretical link of InsurTech with various industries is identified as a potential study topic. Based on the geographical distribution of publications, we suggest more research on InsurTech in emerging/developing countries is required. A number of factors will determine the success of InsurTech in emerging/developing countries. They include the level of technological literacy among consumers and businesspeople, the availability and quality of data, the regulatory environment, and the overall health of the insurance sector. Despite the useful insights documented in our study, readers should be aware of its limitations. This study used specified query/keywords to find the initial list of scholars' works published and indexed by Scopus. This method is prevalent in previous bibliometrics-related studies. Although Scopus is one of the most comprehensive online databases for indexing all scholarly papers, it does not cover all available sources. As a result, some omissions from this study are to be expected. Furthermore, no search query is appropriate for gathering all scholarly papers in a field. As a result, false positive and false negative results are expected. InsurTech is a new terminology that has only recently been developed. There is a probability that previous research on insurance technology centered on the InsurTech topic. However, it was not referred to as InsurTech. Therefore, those studies were excluded from our investigation. Despite these limitations, our analysis provides a starting point for the current global trends in InsurTech research.

References

- [1] Matousek, Roman, Aarti Rughoo, Nicholas Sarantis, and A. George Assaf. "Bank performance and convergence during the financial crisis: Evidence from the 'old' European Union and Eurozone." *Journal of Banking & Finance* 52 (2015): 208-216. <https://doi.org/10.1016/j.jbankfin.2014.08.012>
- [2] Dangi, Mohamad Ridhuan Mat, Nurul Ezhawati Abdul Latif, Emmarelda Maswesi Ahmad, Siti Haliza Asat, and Rohana Mohd Noor. "Supply chain of the automobile industry: Internal control issues, operations, and sustainability of cars exported overseas." *Journal of Advanced Research in Business and Management Studies* 7, no. 2 (2017): 42-54.
- [3] Kelley, C., and K. Wang. "InsurTech: A Guide for the Actuarial Community. Society of Actuaries." (2021).
- [4] L. B. V. Sabine, S. M. Milli, N. Anderson, and S. Chishti, *The insurtech book*. Cornwall, UK: Fintech Circle Ltd, 2018.
- [5] Chuang, Li-Min, Chun-Chu Liu, and Hsiao-Kuang Kao. "The adoption of fintech service: TAM perspective." *International Journal of Management and Administrative Sciences* 3, no. 7 (2016): 1-15.
- [6] de Ferrieres, Matthias. "An Introduction to Insurance Effective Digital Disruption and Impact of Insurtechs in the Insurance Economy."
- [7] Baker, H. Kent, Satish Kumar, and Nitesh Pandey. "Thirty years of the Global Finance Journal: A bibliometric analysis." *Global Finance Journal* 47 (2021): 100492. <https://doi.org/10.1016/j.gfj.2019.100492>
- [8] Donthu, Naveen, Satish Kumar, and Debidutta Pattnaik. "Forty-five years of Journal of Business Research: A bibliometric analysis." *Journal of business research* 109 (2020): 1-14. <https://doi.org/10.1016/j.jbusres.2019.10.039>
- [9] Chen, Xieling, Guoxing Yu, Gary Cheng, and Tianyong Hao. "Research topics, author profiles, and collaboration networks in the top-ranked journal on educational technology over the past 40 years: a bibliometric analysis." *Journal of Computers in Education* 6 (2019): 563-585. <https://doi.org/10.1007/s40692-019-00149-1>
- [10] Albort-Morant, Gema, and Domingo Ribeiro-Soriano. "A bibliometric analysis of international impact of business incubators." *Journal of Business Research* 69, no. 5 (2016): 1775-1779. <https://doi.org/10.1016/j.jbusres.2015.10.054>
- [11] Tague-Sutcliffe, Jean. "An introduction to informetrics." *Information processing & management* 28, no. 1 (1992): 1-3. [https://doi.org/10.1016/0306-4573\(92\)90087-G](https://doi.org/10.1016/0306-4573(92)90087-G)
- [12] Zhong, Shaozhuo, Yong Geng, Wenjing Liu, Cuixia Gao, and Wei Chen. "A bibliometric review on natural resource accounting during 1995–2014." *Journal of cleaner production* 139 (2016): 122-132. <https://doi.org/10.1016/j.jclepro.2016.08.039>
- [13] J. K. C. Chen. "Exploring global innovation research performance and Trend Picmet." Asia University, 2010.

- [14] Van Eck, Nees Jan, and Ludo Waltman. "Bibliometric mapping of the computational intelligence field." *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems* 15, no. 05 (2007): 625-645. <https://doi.org/10.1142/S0218488507004911>
- [15] F. Gutzwiller. "Sozial- und prfiventivmedizin pravektion in der medizinischen versorgung." *Med. Sociale Prev.*, 23 (1978): 365–366. <https://doi.org/10.1007/BF02074229>
- [16] OECD. "Insurance sector responses to COVID-19 by governments, supervisors and industry." 2020. [17] OECD. "Insurance Markets in Figures." 2021.
- [18] Lin, Weiwei; Wu, Ziming; Lin, Longxin; Wen, Angzhan "An ensemble random forest algorithm for insurance big data analysis." <https://doi.org/10.1109/ACCESS.2017.2738069>
- [19] Marsal-Llacuna, Maria-Lluïsa. "Future living framework: Is blockchain the next enabling network?" <https://doi.org/10.1016/j.techfore.2017.12.005>.
- [20] Wing, Oliver; Pinter, Nicholas; Bates, Paul D; and Kousky, Carolyn. "New insights into US flood vulnerability revealed from flood insurance big data". <https://doi.org/10.1038/s41467-020-15264-2>
- [21] Stoeckli, Emanuel; Dremel, Christian; Uebernickel, Falk. 'Exploring characteristics and transformational capabilities of InsurTech innovations to understand insurance value creation in a digital world.' <https://doi.org/10.1007/s12525-018-0304-7>
- [22] Kim, Hyeon Chang; Cho, So Mi Jemma; Lee, Hokyoo; Lee, Hyeok-Hee; Baek, Jongmin; Heo, Ji Eun; Ahn, Song Vogue; Jee, Sun Ha; Park, Sungha; Lee, Hae-Young; Shin, Min Ho; Ihm, Sang-Hyun; Lee, Seung Won; Park, Jong Ku; Suh, Il; and Lee, Tae-Yong. "Korea hypertension fact sheet 2020: analysis of nationwide population-based data." <https://doi.org/10.1186/s40885-021-00166-2>
- [23] Grossklags, Jens; Christin, Nicolas; and Chuang, John "Secure or insure? a game-theoretic analysis of information security games" 17th International Conference on World Wide Web 2008. <https://doi.org/10.1145/1367497.1367526>
- [24] Bi, Ye (57217088888); Song, Liqiang; Yao, Mengqiu; Wu, Zhenyu; Wang, Jianming; and Xiao, Jing. "DCDIR: A Deep Cross-Domain Recommendation System for Cold Start Users in Insurance Domain." 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval. <https://doi.org/10.1145/3397271.3401193>
- [25] Fultz, Neal; and Grossklags, Jens. "Blue versus red: Towards a model of distributed security attacks" https://doi.org/10.1007/978-3-642-03549-4_10
- [26] Styer, Aaron K.; Luke, Barbara; Vitek, Wendy; Christianson, Mindy S.; Baker, Valerie L.; Christy, Alicia Y.; and Polotsky, Alex J. Factors associated with the use of elective single-embryo transfer and pregnancy outcomes in the United States, 2004–2012. <https://doi.org/10.1016/j.fertnstert.2016.02.034>
- [27] Agarwal, Sumit; Bhardwaj, Garima; Saraswat, Ekta; Singh, Namrata; Aggarwal, Rashmi; and Bansal, Ajit. "Insurtech Fostering Automated Insurance Process using Deep Learning Approach." 2nd International Conference on Innovative Practices in Technology and Management, ICIPTM 2022 <https://doi.org/10.1109/ICIPTM54933.2022.9753891>
- [28] Lee, Hyeok-Hee; Cho, So Mi Jemma; Lee, Hokyoo; Baek, Jongmin; Bae, Jang-Ho; Chung, Wook-Jin; and Kim, Hyeon Chang. "Korea heart disease fact sheet 2020: Analysis of nationwide data." *Korean Circulation Journal*. <https://doi.org/10.4070/KCJ.2021.0097>
- [29] Yan, Tan Choon; Schulte, Paul; and Lee Kuo Chuen, David. "InsurTech and FinTech: Banking and Insurance Enablement" *Handbook of Blockchain, Digital Finance, and Inclusion*, Volume 1. <https://doi.org/10.1016/B978-0-12-810441-5.00011-7>
- [30] Cappiello Antonella. "Technology and the insurance industry: Re-configuring the competitive landscape." <https://doi.org/10.1007/978-3-319-74712-5>
- [31] Patel Geeta. "Imagining risk, care and security: Insurance and fantasy" <https://doi.org/10.1177/1463499607074297>
- [32] Nobanee, Haitham. "A Bibliometric Review of Big Data in Finance." <https://doi.org/10.1089/big.2021.29044.edi>
- [33] Ahmi, Aidi, Afiruddin Tapa, and Ahmad Husni Hamzah. "Mapping of financial technology (FinTech) Research: A bibliometric analysis." *Globalization 2* (1967): 2008.
- [34] Chen, Xiuwen, Jianping Li, Xiaolei Sun, and Dengsheng Wu. "Early identification of intellectual structure based on co-word analysis from research grants." *Scientometrics* 121 (2019): 349-369. <https://doi.org/10.1007/s11192-019-03187-9>

- [35] Zupic, Ivan, and Tomaž Čater. "Bibliometric methods in management and organization." *Organizational research methods* 18, no. 3 (2015): 429-472. <https://doi.org/10.1177/1094428114562629>
- [36] Choi, Jinho, Sangyoon Yi, and Kun Chang Lee. "Analysis of keyword networks in MIS research and implications for predicting knowledge evolution." *Information & Management* 48, no. 8 (2011): 371-381. <https://doi.org/10.1016/j.im.2011.09.004>
- [37] Gorzeń-Mitka, Iwona, Beata Bilska, Marzena Tomaszewska, and Danuta Kołożyn-Krajewska. "Mapping the structure of food waste management research: A co-keyword analysis." *International Journal of Environmental Research and Public Health* 17, no. 13 (2020): 4798. <https://doi.org/10.3390/ijerph17134798>