

Supply Chain Demand Risk Management: A Literature Review and Future Research Directions

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Abstract

The coronavirus disease 2019 (COVID-19) has brought tremendous pressure to global supply chain risk management (SCRM). The concept of risk management is characterized by complexity. First, it is challenging in terms of content. Second, risk management is a multidimensional and interdisciplinary research field. This paper conducts a Bibliometric Analysis to determine the fundamental impact of supply chain demand risk management and obtain a structured overview of the characteristics and development of this research field. A total of 768 publications related to supply chain demand risk management were found in the Web of Science database. These publications cover 1677 authors, 189 journals, 50 countries or regions, and 768 institutions. Supply chain demand risk management is divided into two main research areas: (1) collaboration and (2) management. The former research area dominates the current supply chain demand risk management research. In addition, the International Journal of Production Economics is the main journal published, and China and the United States are the countries with the dominant publication volume. It can be seen that this field is still in a rapid development stage, and researchers have shown great interest in it. In addition, supply chain demand risk management research is also characterized by a wide range of research topics and a multidisciplinary nature. The regional inequality of publication output is considered a worrying issue.

Keywords: Supply Chain, Demand, Risk Management, Literature Review

Introduction

Bibliometric analysis is an interdisciplinary science that uses mathematical and statistical methods to quantitatively analyze all knowledge carriers. It is an integral part of research evaluation methods (Ellegaard et al., 2015). Bibliometric Analysis is an analytical technique that is often used in systematic literature reviews - it involves quantitative analysis of scholarly works (Lim et al., 2022; Mukherjee et al., 2022). Through Bibliometric Analysis, the productivity (i. e., publications) and influence (i. e., citations) of research characteristics and contributors (e. g., authors, institutions, countries/regions, funders, and subject areas) in the field can be evaluated. It is one of the two main components of Bibliometric Analysis. In addition, key themes and future themes can be discovered, and trends and gaps in the field that are worth paying attention to can be discovered through Bibliometric Analysis. This is

another main component of Bibliometric Analysis. These two parts constitute the basic components of Bibliometric Analysis (Mukherjee et al., 2022). The core strength of bibliometrics lies in its wide scope and complex details. Bibliometric Analysis is a method of big data analysis (Kumar et al., 2023) that collects data from databases (e. g. Scopus, Web of Science), uses algorithms and quantitative techniques in relevant software (e. g. VOSviewer, SCImago, bibliometrix, citespace) to process, analyze, and objectively report bibliometric data. Although Bibliometric Analysis is quantitative and objective in nature, it requires interpretation, which also introduces subjective factors (Donthu et al., 2021). Therefore, Bibliometric Analysis is a method of quantitative and qualitative analysis of existing articles.

Under the influence of global economic changes, technological advances, and changing consumer preferences, the complexity and strategic importance of supply chain risk management continue to rise, which also makes supply chain risk management more difficult (Olawale et al., 2024). Especially demand risk management, because the greater the uncertainty of customer demand, the greater the supply risk and the greater the enterprise challenge, and the lower the uncertainty of customer demand, the smaller the supply risk and the smaller the enterprise challenge (Tao et al., 2025). In addition, Waqas et al. (2019) pointed out that if a company cannot meet market demand, it cannot survive in the market. (Cao, X. (2025).) It also explains that even companies that are not the strongest or most technologically advanced are often able to thrive by adapting to environmental changes. Therefore, people are paying more and more attention to the field of supply chain demand risk management. This has led to a growing number of publications on on-demand risk management, making it difficult to obtain a comprehensive overview of the topic. In addition, the complexity of the concept of supply chain demand risk management itself further exacerbates this difficulty.

First of all, in terms of content, supply chain demand risk management is a complex topic. Supply chain demand risks not only come from core system factors, such as logistics operations, the unpredictability of advertising rates, inventory levels, sales prices, and product quality (Nand, 2025), but are also affected by external system factors. For example, Digital technologies (Kim et al., 2025), COVID-19 (Żurek & Rudy, 2024), Creating jobs (Amarillo& Azimov, 2025), typhoon(Su et al.,2025).

Secondly, supply chain demand risk management is a multi-dimensional research topic. For example, in the agricultural sector, supply chain demand risk management involves transportation, inaccurate consumer demand, and demand forecast information (Sharma et al., 2020). The application areas of demand risk management also include the food industry (Deng et al., 2024; Krstić et al., 2024; Lwesya et al., 2024), manufacturing (Xu, T et al., 2024; Chien et al., 2024), and the pharmaceutical industry (Sharma et al., 2024).

Finally, the wide range of disciplines involved in supply chain demand risk management also exacerbates its complexity. For example, artificial intelligence algorithms can quickly identify abnormal patterns in demand data fluctuations and issue timely alerts (Xu, Z et al., 2024). Artificial intelligence technology (Groenewald et al., 2024) and machine learning (Elufioye et al., 2024) are used to predict supply chain demand, enhance supply chain resilience, and reduce risks.

There is currently no literature analysis on supply chain demand risk management, and the growing publication rate of supply chain demand risk management makes it the best topic for Bibliometric Analysis. Therefore, in order to fill this research area, this study conducted a comprehensive analysis of articles on the topic of supply chain demand risk management. The purpose of this paper is to provide a macro overview of the main characteristics of supply chain demand risk management publications based on Bibliometric Analysis. The information provided in this paper clearly shows the research progress achieved in the field of supply chain demand risk management research and can help researchers and practitioners identify the fundamental influence of authors, journals, countries, institutions, and research topics. The different parts of this study are organized as follows. Section II introduces the methodology of the literature review. Section III presents the results of the Bibliometric Analysis implemented by computer software. Section IV presents the results and discussion. Section V summarizes the entire paper and introduces future research directions and limitations of this study.

Data and Methods

The data cutoff for this study was September 5, 2024, and was obtained from the Web of Science database. The Web of Science was chosen as the search engine because it is the most widely accepted and commonly used database for the analysis of scientific publications (Yang et al., 2013). In order to improve the quality of the articles analyzed in the literature, only the Web of Science Core Collection was selected, and “supply chain” and “demand risk” or “demand uncertainty” and “management” were used as search keywords. This subject search means that the terms “supply chain” and “demand risk” or “demand uncertainty” and “management” were identified in Searches title, abstract, keyword plus, and author keywords. In order to ensure the robustness of the search results, the condition that some search terms are included in quotation marks was strictly added. The specific search method can be found in fig. 1. As can be seen from the bottom of fig. 1, the search date (i. e., September 5, 2024), that is, the last update date of the Web of Science database, is September 5, 2024. If exactly the same search strategy is performed on different dates, the results may be slightly different. These differences are because Web of Science is constantly updated (also retrospectively), which may result in minor changes over time (Liu et al., 2013). Through the above search, a total of 1350 publications related to supply chain demand risk management were found. Among them, articles (n = 1153), review articles (21), and conference papers (n = 198), other document types, such as early access, editorial materials, and book chapters, are limited in number (less than one hundred each). Each publication in Web of Science contains much detailed information, including author, author address, country of publication, year of publication, journal, title, subject category, references, abstract, etc. In order to obtain the highest relevance and professionalism, ensure the accuracy and reliability of the article content, be able to widely cover the research topics and fields, and provide rich data and information, only articles published in international journals were selected for analysis. Therefore, the articles in this study do not include conference papers, editorials, textbooks, master's theses, and other research results and trends in this field, thereby providing strong support and guidance for its research. In order to make the article more up-to-date, journal articles (n=768) with a time span of nearly ten years from 2015 to 2024 were finally selected. The data of 768 publications stored in Web of Science have been exported to plain text files, as shown in the figure. 2Paper selection process. The Citation Report in Web of Science was used to export the publication output and growth trend, and the publication citation growth trend. The free software program VOSviewer was used to analyze the keyword co-occurrence

relationship, and the country and keyword were exported and saved in GML file format to prepare for bibliometrix analysis. The free software program Bibliometrix was used to analyze the following topics: (1) authors and their collaborations, (2) subject categories, (3) journal publications, (4) geographical distribution, (5) citation analysis, and (6) subject development trends. In general, the interpretation is as follows: the size of the circle and the font of the label represent the number of occurrences, the color represents the clustering, and the distance between two circles reveals the correlation and similarity between them (Rizzi et al., 2014; Khalil and Gotway-Crawford, 2015).

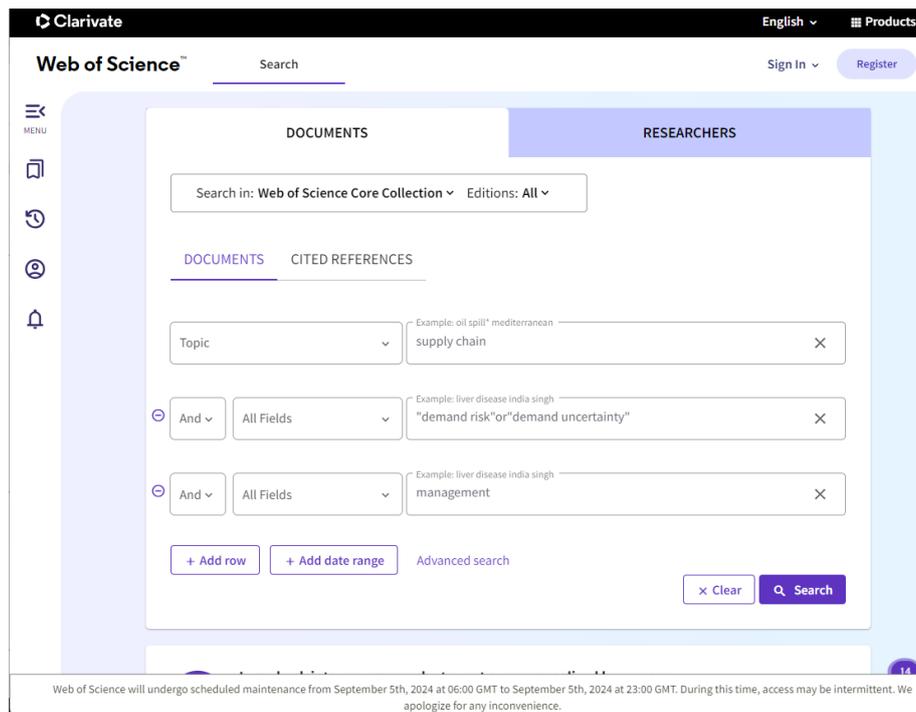


Fig. 1. Search method in Web of Science.

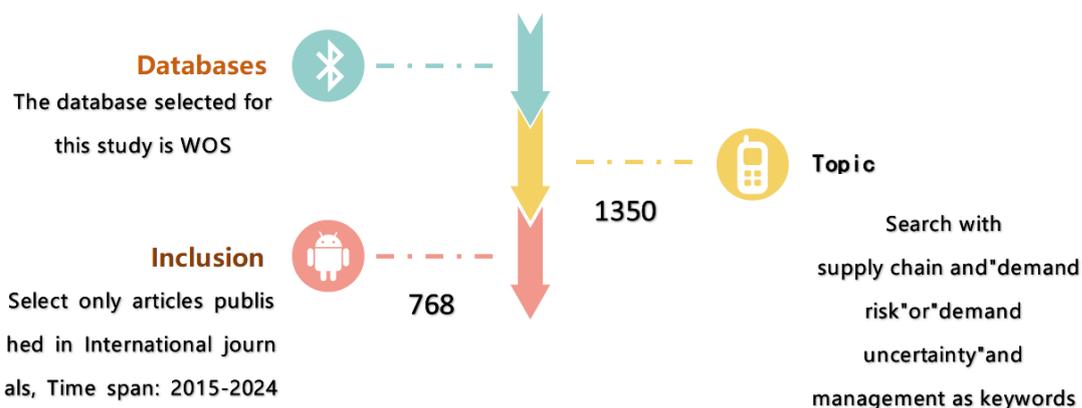


Fig. 2. Paper selection process.

Related Bibliometric Studies

A rigorous screening of articles resulted in the final selection of the 768 papers most relevant to this study, and to present a clearer picture of the selected articles, this section provides a descriptive analysis of the publications, distribution of research areas, regional distribution, and published journals.

Annual publication and citation trend

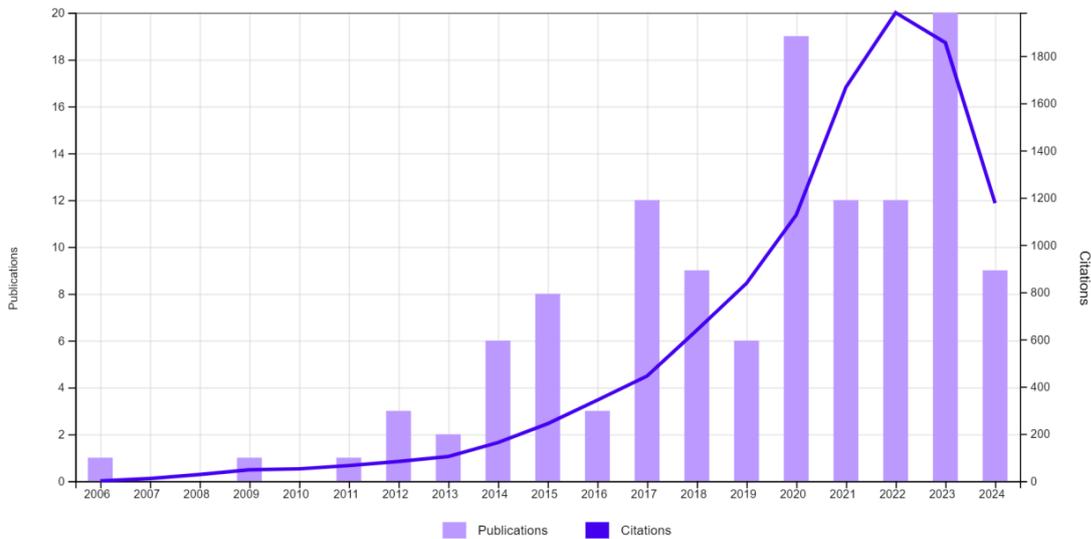


Fig. 3. Annual publication and citation trend.

From the number of articles published and the number of citations in fig. 3, we can see that the number of articles on supply chain demand risk management research has generally increased over time, and the frequency of citations of articles each year has shown a clear upward trend. It can be seen that since supply chain demand risk management began to enter the research field in 2006, related research has lasted for nearly 20 years, but it has not received attention from the academic community. It was not until 2012 that it gradually received attention from researchers, especially after COVID-19 in 2019, which made scholars pay attention to the importance of supply chain demand risk management research. It then showed a rapid growth trend, which shows that researchers have begun to realize that the use of efficient supply chain demand risk management can improve the ability of enterprises to resist risks.

Regional Distribution



Fig. 4 . Country Network.

Determining the geographical distribution of articles helps to clarify the profile of researchers conducting supply chain demand risk management research in various regions. This section analyzes the country distribution of the mailing addresses of all article authors and uses the SCImago free software to intuitively depict the countries where these researchers are located, as shown in fig. 4. Existing supply chain demand risk management research is mainly concentrated in CANADA, CHINA, INDIA, IRAN, and the USA, and is growing year by year, as shown in fig. 5. This is mainly because North America is a well-known global supply chain center, contracting most of the world's developed economies. The outbreak of COVID-19 in China in 2019 has caused a global crisis and a serious impact on enterprises. In addition, Southeast Asia has the dual advantages of labor and natural resources, which have attracted many countries to transfer labor-intensive industries to Southeast Asia, making the Southeast Asian supply chain an important part of global economic development. Therefore, these regions are paying more attention to the study of supply chain demand risk management to better prevent and mitigate the adverse effects of risk events on the development of the global supply chain, but the unevenness of producing countries is very obvious. However, the countries in the African plate have made little contribution to the research on supply chain demand risk management, and most countries have not contributed.

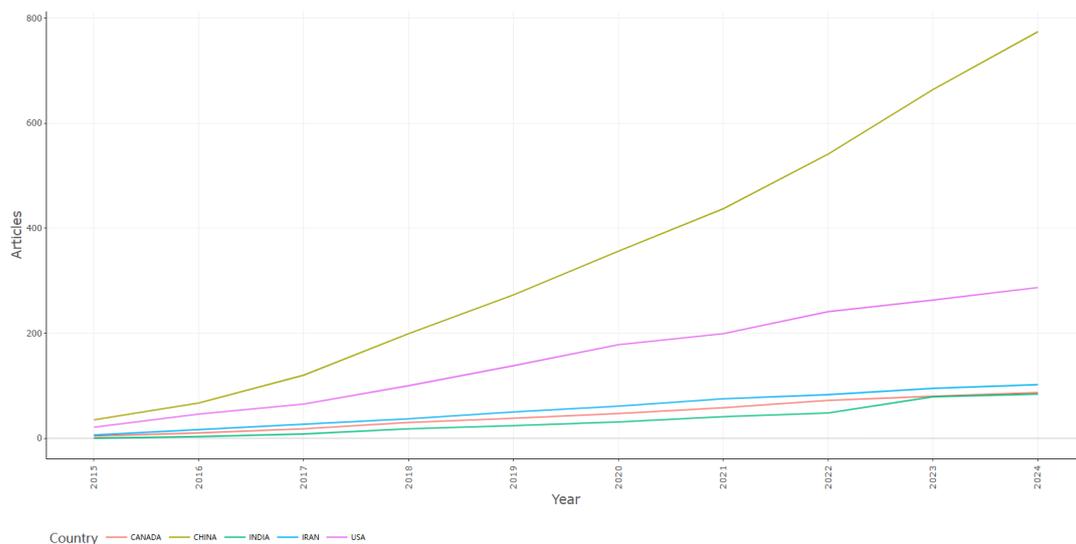


Fig. 5. Countries' Production over Time.

Citation Analysis

Table 1

Top 10 cited articles

NO	Paper	Total Citations	TC per Year	Normalized TC
1	COHEN MC, 2016, MANAGE SCI	360	40.00	10.02
2	YANG SA, 2018, MANAGE SCI	320	45.71	10.99
3	CARDOSO SR, 2015, OMEGA-INT J MANAGE S	152	15.20	3.92
4	SOYSAL M, 2015, INT J PROD ECON	147	14.70	3.79
5	DILLON M, 2017, INT J PROD ECON	142	17.75	4.94
6	PASANDIDEH SHR, 2015, INFORM SCIENCES	129	12.90	3.33
7	HE YJ, 2015, INT J PROD ECON	113	11.30	2.92
8	WU DS, 2019, PROD OPER MANAG	113	18.83	4.44
9	LI T, 2015, OMEGA-INT J MANAGE S	111	11.10	2.87
10	GHAHREMANI-NAHR J, 2019, EXPERT SYST APPL	111	18.50	4.36

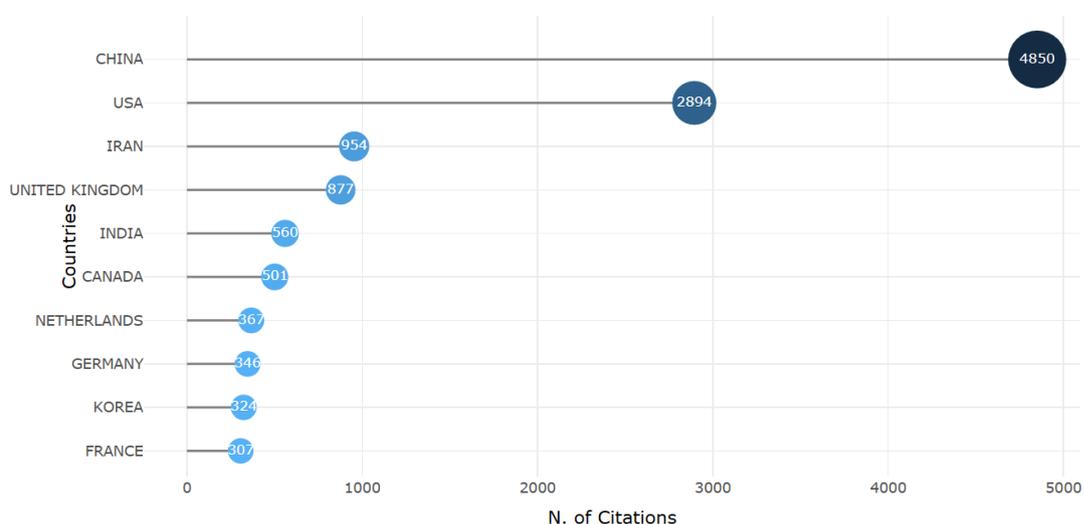


Fig. 6 . Country Network.

Citation counts are considered an important indicator of the impact of an article and an important indicator for determining the acceptability of research in the field by other researchers. Table 1 shows the top 10 most cited articles, including the cumulative number of citations in WOS and the average number of citations per year, which is based on how often other articles in WOS cite an article. On average, these articles are cited about 20 times. 60 times per year. The most cited study is “COHEN MC, 2016, MANAGE SCID”, which is cited 360 times. The second most cited article is “YANG SA, 2018, MANAGE SCI”, which is cited 320 times. It is followed by “CARDOSO SR, 2015, OMEGA-INT J MANAGE S”, with 152 citations, and “SOYSAL M, 2015, INT J PROD ECON”, with 147 citations. It is worth noting that the most cited articles were published before 2018. However, looking at this study, the number of citations is very high, indicating that there are few articles in this field and they are widely accepted by researchers. These articles are distributed in China and the United States, as shown in fig. 6. It can be seen that China and the United States have made the most contributions to the research on supply chain risk management, and other countries have relatively few citations, indicating that the research on supply chain risk management has not yet become mainstream

research in the world, and other countries have not yet paid attention to the obvious advantages of supply chain risk management.

Authors and Affiliation

Table 2

Top 10 Authors

Authors	Articles	Articles Fractionalized
WANG C	11	4.17
CHEN X	9	3.78
CHOI TM	9	3.20
GOVINDAN K	9	2.95
CHENG TCE	6	1.78
NIU BZ	6	2.17
QIU RZ	6	1.70
TSAO YC	6	5.20
XUE WL	6	1.83
ZHENG MM	6	1.40

Table 2 lists the top 5 most productive authors on the topic of supply chain demand risk management. The ranking is based on the total number of publications by author, not the order of the authors. WANG C is the most productive author on the topic of safety culture, with 11 publications, followed by CHEN X, CHOI TM, and GOVINDAN K, all with 9 publications. Total number of articles by country. In the heat map of fig. 7, it is clear that most of them were produced in China (335 articles), followed by the United States (115 articles) and Iran (51 articles).

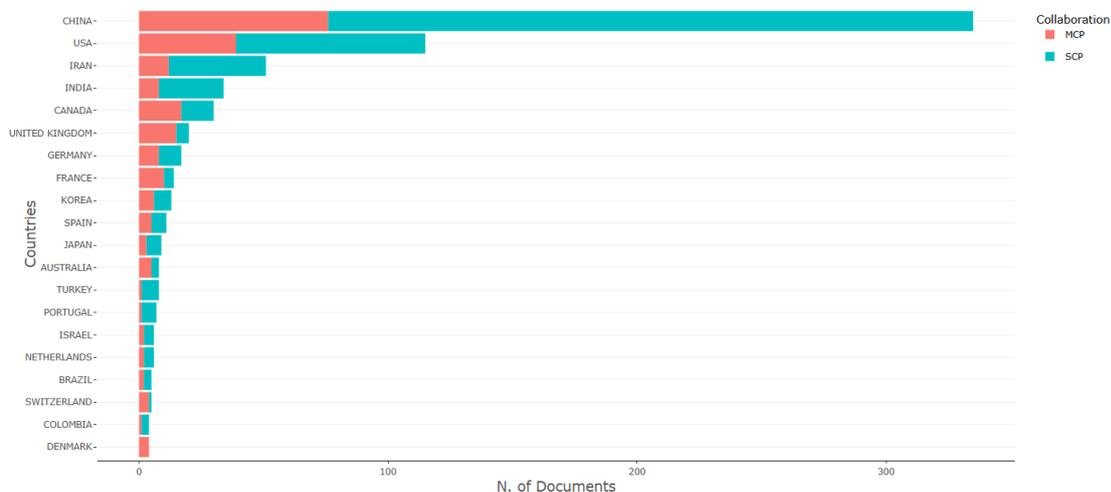


Fig. 7. Country scientific production.

Table 3

Most Relevant Affiliations

Affiliation	Articles
HONG KONG POLYTECHNIC UNIVERSITY	32
CHINESE ACADEMY OF SCIENCES	27
INDIAN INSTITUTE OF MANAGEMENT (IIM SYSTEM)	26
TIANJIN UNIVERSITY	25
UNIVERSITY OF ELECTRONIC SCIENCE AND TECHNOLOGY OF CHINA	19
BEIHANG UNIVERSITY	18
ISLAMIC AZAD UNIVERSITY	17
NORTHEASTERN UNIVERSITY - CHINA	17
SOUTH CHINA UNIVERSITY OF TECHNOLOGY	17
UNIVERSITY OF TEHRAN	17

768 different research institutions participated in 768 publications with institutional information (an author can belong to multiple institutions, or a publication can be written by multiple authors from different institutions). This article lists the top 10 institutions with the largest number of publications: Hong Kong Polytechnic University, Chinese Academy of Sciences, Indian Institute of Management (IIM system), Tianjin University, University of Electronic Science and Technology of China, Beihang University, Islamic Azad University, Northeastern University - China, South China University of Technology, University of Tehran, all of which are from universities, of which 72.09% (n = 1361) of the publishing institutions are from China, and the institution with the most publications is Hong Kong Polytechnic University (32 articles), which shows the importance of Chinese research institutions to it, as shown in Table 3.

Publication sources

Table 4

Top 10 Publication Sources

N O.	Source	h_ind ex	g_ind ex	m_in dex	TC	N P	PY_st art
1	INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS	25	44	2.5	2000	55	2015
2	EUROPEAN JOURNAL OF OPERATIONAL RESEARCH	21	32	2.1	1061	41	2015
3	COMPUTERS & INDUSTRIAL ENGINEERING	18	27	1.8	817	44	2015
4	INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH	18	30	1.8	966	45	2015
5	OMEGA-INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE	16	29	1.6	862	29	2015
6	PRODUCTION AND OPERATIONS MANAGEMENT	15	24	1.5	647	24	2015
7	ANNALS OF OPERATIONS RESEARCH	12	24	1.333	611	26	2016
8	JOURNAL OF CLEANER PRODUCTION	11	16	1.375	467	16	2017
9	MANAGEMENT SCIENCE	10	12	1.111	938	12	2016
10	TRANSPORTATION RESEARCH PART E-LOGISTICS AND TRANSPORTATION REVIEW	10	18	1.111	332	19	2016

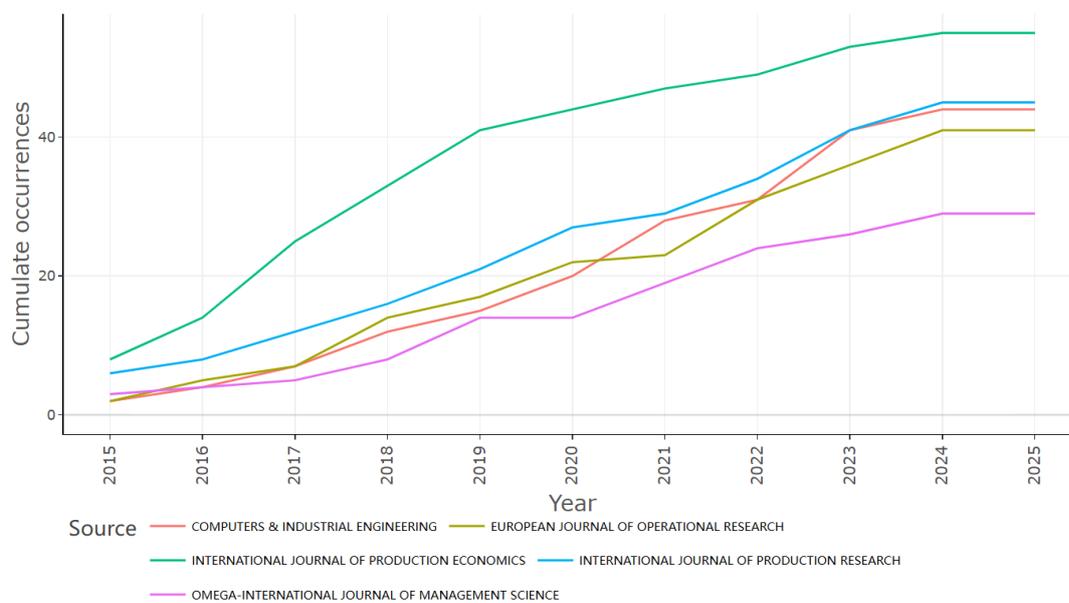


Fig. 8. Journal sources.

Analyzing the journals that publish peer-reviewed articles helps to understand the acceptance of papers in the field. Journals in various fields (e. g., computing, management, sustainability, business, logistics) publish articles on SCRM and blockchain algorithms. A total of 189 journals were included in this review. Table 4 shows the top 10 journals that contributed the most out of the 768 articles reviewed, mainly from 2015 to 2016. These journals are scattered in the fields of production, management, and computing, indicating a trend of fixed journal publishing in this field, as shown in the figure. 8. Supply chain researchers have noted the benefits of demand risk management (e. g., INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS, EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH, OMEGA-INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE, PRODUCTION AND OPERATIONS MANAGEMENT, ANNALS OF OPERATIONS RESEARCH, JOURNAL OF CLEANER PRODUCTION MANAGEMENT SCIENCE, TRANSPORTATION RESEARCH PART E-LOGISTICS AND TRANSPORTATION REVIEW). In addition, some BCT researchers may be very interested in the issue of supply chain demand risk management. Their views on this area appear in several computing and interdisciplinary journals, such as COMPUTERS & INDUSTRIAL ENGINEERING. Overall, the attention of researchers in this field guides responses to the crisis and prompts other researchers and practitioners to notice the benefits of supply chain demand risk management and apply it in practice.

Keyword Co-Occurrence Analysis

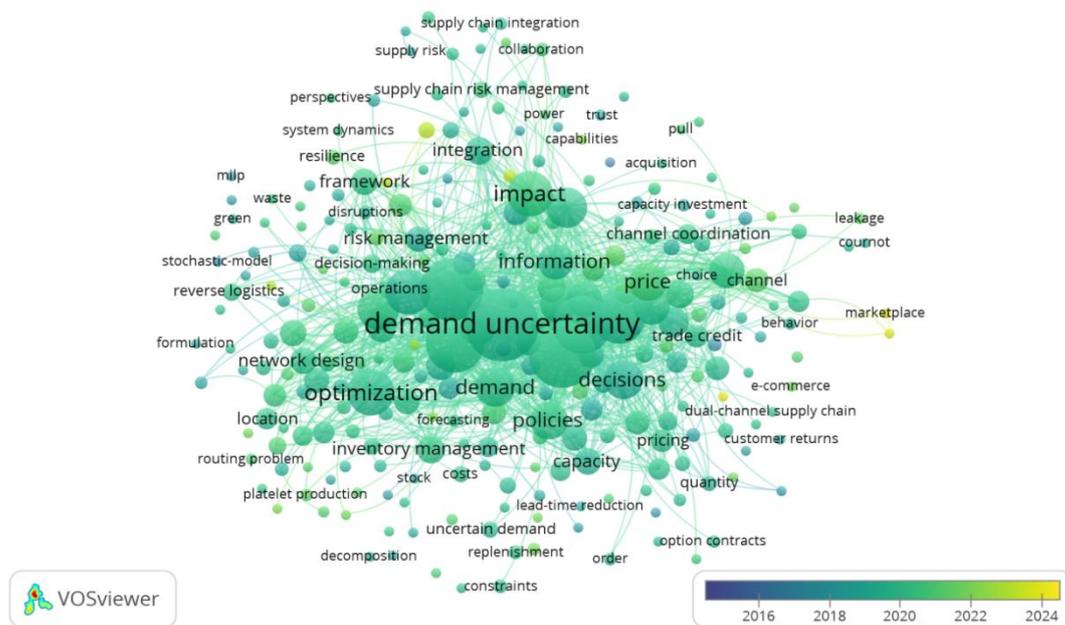


Fig. 9 . Co-occurrence overlay of keywords.

Keyword co-occurrence refers to the co-occurrence of two or more keywords in an article. Co-occurrence analysis uses the co-occurrence of word pairs or noun phrases in a set of documents to identify the relationship between the subject topics represented by the set. It is a content analysis method based on existing literature and can directly reflect the structure and trend of research.

This paper extracted 267 keywords from 768 documents and analyzed them with VOSviewer, showing the keyword sharing network about supply chain demand risk management, as shown in fig. 9, which shows the term analysis of supply chain demand risk management publications, but with time information. The color of the term indicates the average publication year of the term. The average publication year of the term is calculated by the average of the publication years of all publications containing the term in the title or abstract.

Before 2020, supply chain demand risk management research mainly focused on optimization, supply chain management, price, integration, policy, decision-making, and network design; after 2020, a large number of supply chain demand risk management research focused on marketplace agency, online, risk, and robust optimization. Finally, the map shows the growth trend of publications related to enterprise resilience and new technologies. In summary, the time map of the terms shows a general trend away from enterprise resilience, especially away from more technical factors. It can be seen that today's researchers and practitioners have a stronger demand for risk management and have begun to actively enhance supply chain demand risk management and integrate new technologies for its implementation.

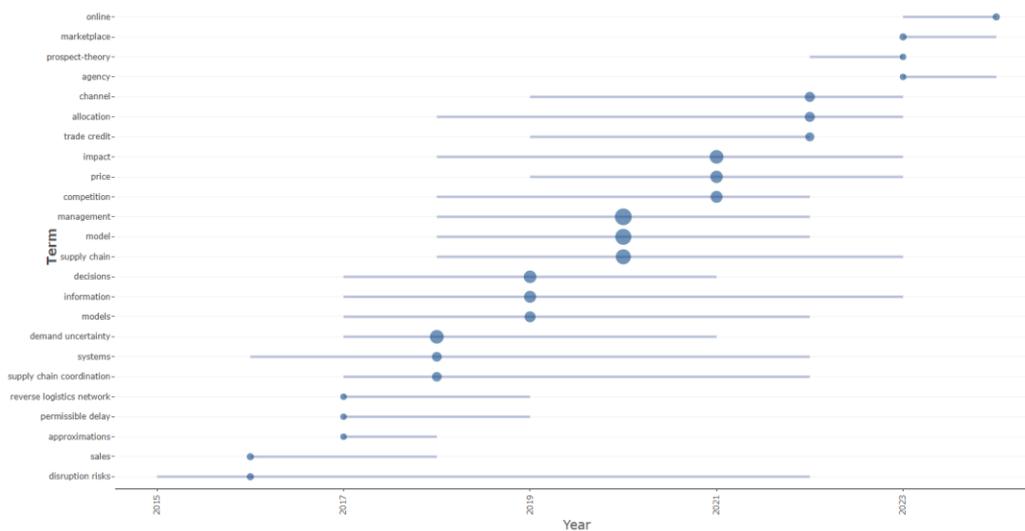


Fig. 11. Trend Topics

Trend topics analysis mainly involves scientific measurement and systematic summary of literature data, based on the search trends of the most important keywords, to reveal the research hotspots and future trends in the research field. As shown in fig. 11, the research topics in the past 10 years show that interruption risk has received the longest attention, and in 2020, management, model, supply chain, decision-making, and price competition have become the hottest topics in supply chain demand risk management research. The fig. also clearly shows that since 2015, supply chain demand has begun to receive attention from researchers, and publications have continued to rise. Scholars mainly focus on interruption risk and sales, which are topics directly related to consumers, and then focus on market demand uncertainty, supply chain coordination, reverse logistics network, and permissible delay, expanding the thinking from direct factors in contact with consumers to more indirect factors related to consumers. With the development of the Internet, researchers' focus has gradually shifted to market prospects, prices, management, and online service topics.

Results and Discussion

In the study of supply chain risk management, researchers mainly focus on the internal risks of the supply chain, such as production risk, inventory risk, quality risk, and information risk, while there is little research on the internal demand risk of the supply chain. This paper selects 768 articles from the WOS database for literature analysis to find out the current status of supply chain demand risk management and future research trends.

First, this paper evaluates the global research trends of supply chain demand risk management publications from 2015 to 2024. The topic of supply chain demand risk management has been a broad research field in the past decade, and its publication output has increased exponentially. However, the latest trends indicate that the scientific output of this field is close to saturation. Whether the number of publications will continue to grow in the future is not yet clear.

Second, this paper includes 768 publications on supply chain demand risk management, covering 1,677 authors, 189 journals, 50 countries or regions, and 768 institutions. The field of supply chain demand risk management can be divided into two main research areas: (1)

management and (2) collaboration. The research field of supply chain demand risk management seems to be more theoretical, while the research field of supply chain demand risk management collaboration is more practice-oriented.

Second, with the development of online shopping, research in the field of online demand risk management dominates supply chain demand risk management research today. Bibliometric studies in other fields have also found a power law distribution (Li and Zhao, 2015), which applies to many aspects of supply chain demand risk management publications: (1) Most authors (85.39%) have published articles in only one publication, and a small number of prolific authors have contributed to a considerable number of publications in supply chain demand risk management research (4.29% of authors have published at least three articles); (2) Among all journals that publish on this topic, 76.72% of journals have only published 1-2 publications. A small number of journals (10.05%) have published 5 or more supply chain demand risk management publications;

Third, the analysis also provides information about who is at the forefront of this research field: WANG C, CHEN X, CHOI TM, and GOVINDAN are the most productive authors with the largest number of articles published. Both authors are from China and publish in the fields of Operations Research Management Science and Engineering Industrial; COHEN MC and are the most cited authors with more than 300 citations each, which means that other authors have (direct or indirect) connections with one of them; INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS, INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH, COMPUTERS & INDUSTRIAL ENGINEERING, and EUROPEAN JOURNAL OF OPERATIONAL RESEARCH are the main journals publishing supply chain risk management; China and the United States are the countries and regions with the dominant publication output. In the collaborative network, other countries and regions have (direct or indirect) connections with one of these major contributing countries.

Finally, some positive aspects can be drawn from the Bibliometric Analysis. First, it can be concluded that there is a lot of collaborative research in the field of supply chain demand risk management, with a total of 50 publications in journals. Second, many different journals have published articles on the topic, and supply chain demand risk management publications are assigned a wide range of subject categories, which shows that there is a wide variety of research topics and supply chain demand risk management research is multidisciplinary in nature. In addition, some points worth noting can be drawn. First, geographical inequalities related to economic development can be seen in the research on supply chain demand risk management. Oceania, South America, and especially Africa have very limited shares. Second, with regard to supply chain demand risk management, there seems to be a shift from technical aspects to more human aspects. When solving the problem of supply chain demand risk management, the human aspect is important; however, it should be acknowledged that the technical aspect is still important. As Ni et al. (2020) pointed out, supply chain management (SCM) is also affected by uncertainty or information asymmetry, which is described as the "bullwhip effect" amplified upstream of demand changes. Therefore, it is difficult to prepare accurately for each entity. In other words, supply chain demand risk management is holistic and comprehensive, and includes human, technical, environmental, organizational, and other factors.

Limitations

There are still some limitations in this study that need to be addressed before concluding. First, this paper only considered articles in the WOS database for screening. Although Web of Science is one of the largest databases in the world, it certainly does not contain all publications in the field of safety culture research, but it is smaller in scope, and some papers related to demand risk in business and management journals may be excluded from the analysis. It can be expanded to Science Direct, Scopus, Wiley Online Library, Springer Nature, JSTOR, Taylor & Francis, IEEEExplore, Emerald, and Google Scholar databases to increase the richness of articles. Second, this study is based on keyword search, so the results are limited to keyword combinations, and keywords may not capture all the work. Despite these limitations, this study summarizes the current research status in this field. For researchers, this study shows the research status and development trends of supply chain demand risk management, which can provide a reference for the selection of further research topics. This study allows practitioners to understand the benefits of supply chain demand risk management and helps them better cope with supply chain changes brought about by uncertain environments. Second, it is also recognized that Bibliometric Analysis only provides short-term forecasts in the research field (Donthu et al., 2021). Therefore, with the passage of time, the development of society, and the continuous progress of science, the conclusions drawn in this study will be controversial, mainly because Bibliometric Analysis is an analysis of existing articles and cannot keep pace with the times. Finally, Bibliometric Analysis uses quantitative methods. This leads to the neglect of other valuable information, such as the distinction between theoretical and empirical papers, and the background details of empirical research (such as the industry or country where the research was conducted). Based on these limitations of Bibliometric Analysis, it is recommended to conduct a more in-depth content analysis in further research.

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