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**Mushtaq Ahmad Bhat**
Research Scholar, Department of Commerce University of Kashmir, Srinagar, Jammu & Kashmir, India

**Firdous Ahmad Hurrah**
Research Scholar, Department of Commerce University of Kashmir, Srinagar, Jammu and Kashmir, India

**Mohi-ud-din Sangmi**
Professor, Department of Commerce University of Kashmir, Srinagar, Jammu & Kashmir, India

**Corresponding Author:**
**Mushtaq Ahmad Bhat**
Research Scholar, Department of Commerce University of Kashmir, Srinagar, Jammu & Kashmir, India

# Supply chain cost management: An integrated systematic review and bibliometric analysis

**Mushtaq Ahmad Bhat, Firdous Ahmad Hurrah and Mohi-ud-din Sangmi**

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**Abstract**
**Purpose:** The goal of this study is to perform a thorough bibliometric analysis of the academic literature on supply chain costs and logistics, with a focus on authorship networks, citation patterns, and publication trends. Through the use of sophisticated bibliometric techniques, the goal is to map the field's intellectual landscape and highlight important contributors, emerging themes, and understudied areas.
**Design, methodology, and approach:** A systematic review of 335 peer-reviewed articles from the Scopus database that were published between 2010 and 2024 served as the basis for the analysis. Publications in English from the business, management, and accounting subject areas that specifically address supply chain cost and logistics are included in the dataset. VOS viewer was used for bibliometric mapping and visualisation. The analysis encompasses contributions from 57 countries, providing a global perspective on the research landscape.
**Findings:** More than 897 authors participated, 1121 unique keywords were used, and 14,447 references were found in 151 scholarly journals, according to the bibliometric review. The compilation of this information provides insightful information about the field's scholarly influence and thematic development. The study highlights significant research gaps in the areas of transportation, optimisation, and supply chain cost management-all of which are essential to comprehending and controlling overall supply chain costs.
**Originality/value:** By identifying important knowledge clusters and research gaps in the literature on logistics and supply chain costs, this study makes a substantial contribution to the academic community. It is a useful tool for academics and professionals who want to learn more about supply chain cost dynamics. The study also enriches the conversation on efficient and cost-effective supply chain strategies by highlighting trends in global contributions from 57 countries and identifying priority areas for further research.

**Keywords:** Logistics, supply chain cost management, systematic literature review, bibliometric analysis, PRISMA, VOSviewer

## Introduction
With increasingly interconnected and competitive world economy, Supply Chain Cost Management (SCCM) has emerged as a key driver of organizational performance, strategic robustness, and long-term competitiveness. With increasingly globalized, digitally networked, and customer-oriented supply chains, organisations are under growing pressures to reduce costs while, concurrently, providing service quality, responsiveness, and sustainability (Chopra & Meindl, 2019; Christopher, 2016). With such dynamic settings, effective cost management in procurement, production, transportation, warehousing, and distribution has become the key to supply chain strategy success (Mentzer *et al.*, 2001; Ahi & Searcy, 2013).
Supply Chain Management (SCM), as defined, involves coordination of material, information, and financial flows through the internal and external activities of a firm with an aim to generate value to the ultimate consumer (Pettersson & Segerstedt, 2013; Prajogo *et al.*, 2016) [188]. Present supply chain realities, however, are characterized by increasing volatility and uncertainty in demand. To meet this, organizations are taking steps to ensure profitability through proactive cost alignment and responsiveness to variations outside (Mangal & Gupta, 2015) [147]. Total supply chain cost management-through sourcing, manufacturing, logistics, and delivery-has more than a bottom-line influence, but also is a source of competitive advantage (Whicker *et al.*, 2009).

More recent simulation-based studies have shown how uncertainty in demand and cost can have a significant impact on profitability, exposure to risk, and outsourcing and fast production capacity choices in competitive markets (Liu & Nagurney, 2013). Additionally, the integration of economic efficiency and sustainability into supply chain management has become more important, as firms strive to create cooperative networks where all parties benefit-historically a challenging objective to achieve due to inability to measure intangible payback (Chiadamrong & Wajcharapornjinda, 2012) [55]. High-probability, low-cost but high-impact risks, such as shortages or disruption of resources, increase complexity in the cost management landscape (Alsobhi *et al.*, 2018).

SCCM is now beyond in-house cost-cutting programs but incorporates a broader array of practices with emphasis on cost transparency, coordination among organizations, and long-term value creation. Contemporary ideas require strategic collaboration with suppliers, real-time information sharing, and shared planning across the supply chain (Cooper *et al.*, 1997; Dekker & van Goor, 2000). The unprecedented disruptions caused by crises like the COVID-19 pandemic, geopolitical tensions, and escalating energy prices have only raised the urgency for robust, cost-efficient, and responsive supply chains (Ivanov & Dolgui, 2020; Queiroz *et al.*, 2020).

In spite of increasing volumes of SCM research literature, scholarly argument solely focused on cost management continues to be fragmented and indistinct. Existing literature has largely addressed diverse factors like inventory management (Ketokivi & Schroeder, 2004), transport optimization (Tseng *et al.*, 2005), and purchasing systems (Kraljic, 1983) without taking a holistic perspective towards end-to-end total cost management of supply networks. Hence, intellectual landscape, thematic directions, and new frontiers of SCCM research continue to be indistinct.

To bridge this knowledge gap, the present study performs systematic review of scholarly literature and bibliometric analysis of research on SCCM, with the aim of providing a general overview of its scholarly community. Bibliometric methods are particularly well-suited to summarizing large sets of scholarly publications, enabling one to identify patterns of citations, thematic clusters, knowledge evolution, and geographic distributions (Zupic & Čater, 2015; Cobo *et al.*, 2011). With the assistance of advanced bibliometric software VOSviewer and CitNetExplorer and based on 335peer-reviewed articles indexed by the Scopus database from 2010-2024, the study investigates publication patterns, leading authors, most popular journals, keyword co-occurrence networks, and world research contributions of 57 nations.

Finally, this paper aims to contribute to scholarly knowledge of SCCM by tracing its evolution, determining areas of knowledge gaps, and mapping directions for future research. The conclusions are intended to act as a guide for scholars and practitioners who want to extend their involvement in cost-focused supply chain approaches in a world of global complexity and uncertainty.

## Research Methodology

Research methodology refers to the systematic and theoretical examination of the methods used in a study. It acts as a framework that assists researchers in gathering, analysing, and interpreting data in line with their research aims (Creswell, 2014). In this study, a Systematic Literature Review (SLR) combined with bibliometric analysis has been used to investigate the intellectual landscape, research patterns, and thematic advancements in supply chain and logistics cost management. This methodological approach is further bolstered by adhering to the PRISMA 2020 guidelines, which promote transparency, reproducibility, and rigor throughout the review process.

### Systematic Literature Review and Database Selection

A systematic review systematically identifies, selects, and synthesizes existing research to address clearly defined research questions. It adheres to a specified protocol that includes explicit criteria for inclusion and exclusion, the choice of reliable databases, suitable keywords, and both qualitative and quantitative approaches to evaluate the literature (Tranfield, Denyer, & Smart, 2003).

For this research, the Scopus database was chosen as the main source for bibliographic data due to its broad scope and coverage of peer-reviewed works from renowned publishers like Elsevier, Springer, Emerald, Taylor & Francis, Inder1+Science, IEEE, and Wiley. Scopus provides advanced filtering options, strong citation indexing, and consistent metadata, making it particularly suitable for bibliometric assessments in business, management, and supply chain areas.

The literature search was limited to peer-reviewed publications in English within the field of Business, Management, and Accounting, covering the years from 2010 to 2024. A structured strategy using keywords was employed, focusing on the core term "supply chain costs" while incorporating Boolean operators to include phrases like "cost optimization," "logistics cost management," and "cost control." Articles that were only loosely related—such as those cantered on "energy" or "bioenergy"—were excluded unless they addressed cost aspects relevant to supply chain contexts.

### PRISMA Framework and its Relevance

To enhance the methodological transparency and reproducibility of this review, the study adhered to PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page *et al.*, 2021). PRISMA includes a 27-item checklist and a four-phase flow diagram to effectively structure and document the systematic review process. This framework improves the quality and clarity of reporting by detailing each stage of the review-Identification, Screening, Eligibility, and Inclusion-and reduces potential biases by enforcing objective selection criteria (Liberati *et al.*, 2009) [279].

Incorporating PRISMA in this study ensures that all decisions regarding article selection are thoroughly documented, contributing to a high standard of academic integrity and allowing for future replication or extension of the research.

### PRISMA-Based Review Process

The literature review guided by PRISMA was conducted in four phases:

1. **Identification Phase:** An initial search using the Scopus database resulted in 1,012 records published between 2010 and 2024. This search incorporated a set of precisely defined keywords related to the management of costs in supply chain and logistics. The

focus was on articles that were published in English within the domains of Business, Management, and Accounting.

2. **Screening Phase:** After eliminating 23 duplicate or inaccessible records, 989 documents were left for the review of titles and abstracts. Articles that did not align with the research focus, like those addressing engineering or pure sciences, were discarded, leading to the exclusion of 643 unrelated entries.
3. **Eligibility Phase:** The remaining 346 documents underwent a full-text examination to verify compliance with the inclusion criteria. Only peer-reviewed journal articles, conference proceedings, review papers, or book reviews were considered. Eight documents were removed for not fulfilling the type criteria, and three non-English articles were excluded to maintain language consistency.
4. **Inclusion Phase:** After the multi-stage screening, 335 articles were chosen for bibliometric and content analysis. These pieces formed the basis for tracking the development of research in supply chain cost management, highlighting key authors, institutions, and thematic trends in the area.

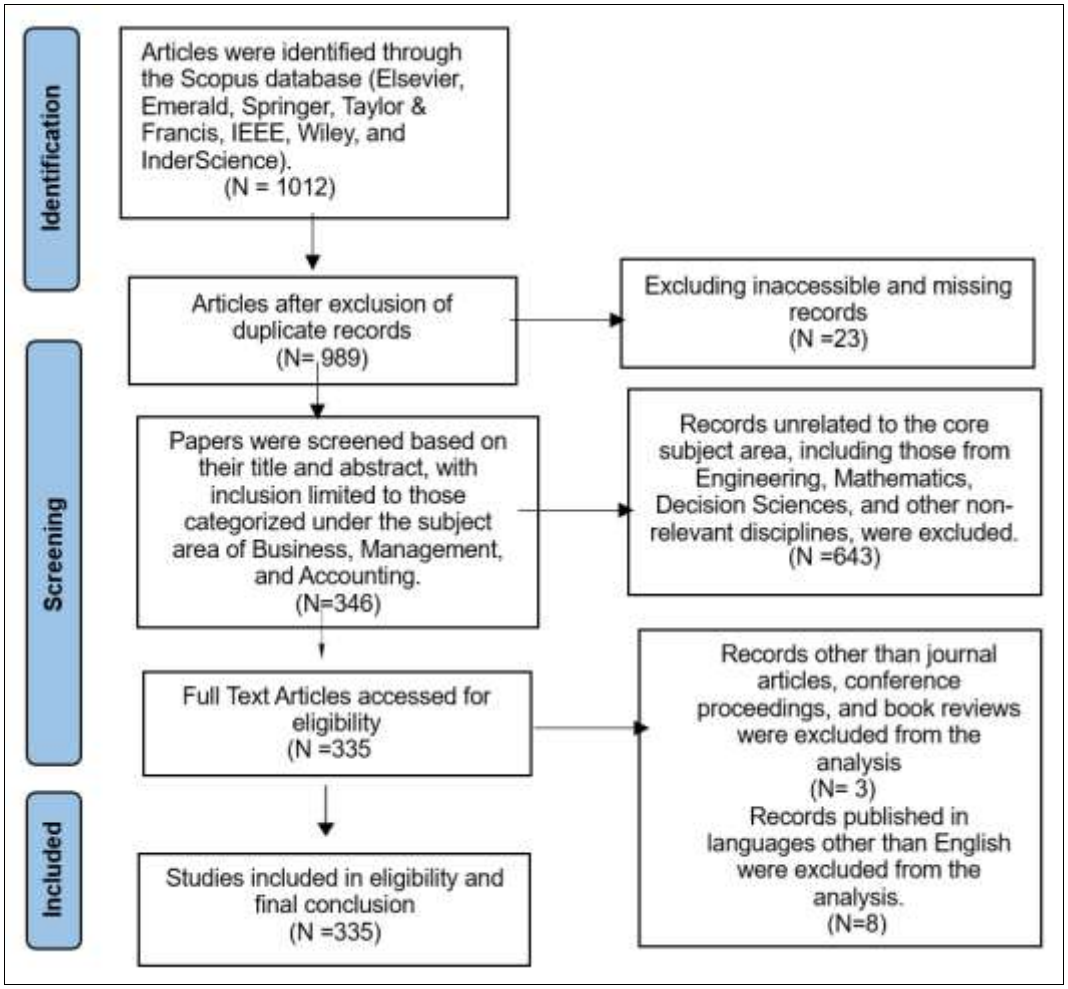


**Fig 1:** PRISMA flowchart for the paper selection process

**Bibliometric Mapping and Visualization**

For understanding the supply chain cost management field's intellectual framework and its historical movements deeply, this research aimed to examine the bibliometric maps using VOSviewer (version 1.6.15), the software designed by Van Eck and Waltman (2020) [280].

VOSviewer enhances scientific research by providing a visual understanding of connections within networks because it enables both qualitative yet also quantitative scholarship evaluations. VOSviewer was used to scrutinize the bibliographical data acquired from Scopus. The software created a variety of network visualizations such as:

**Co-Authorship Analysis (Authors and Countries)**

This Study tracked collaboration patterns over research by investigating the publication numbers of various countries' authors and institutions. The strength of inter-country connections depicts the volume and intensity of research collaborations conducted internationally and their scholarly relationships.

**Keyword Co-Occurrence Analysis**

External keywords provided were analysed in order to find thematic areas and new research trends which are still underexplored. The strength of associations between two keywords indicates the degree of overlap of documents containing both keywords that is the use of important primary research themes.

**Citation and Co-Citation Analysis:** The utmost analysed research papers, authors, and documents in terms of citations were identified.

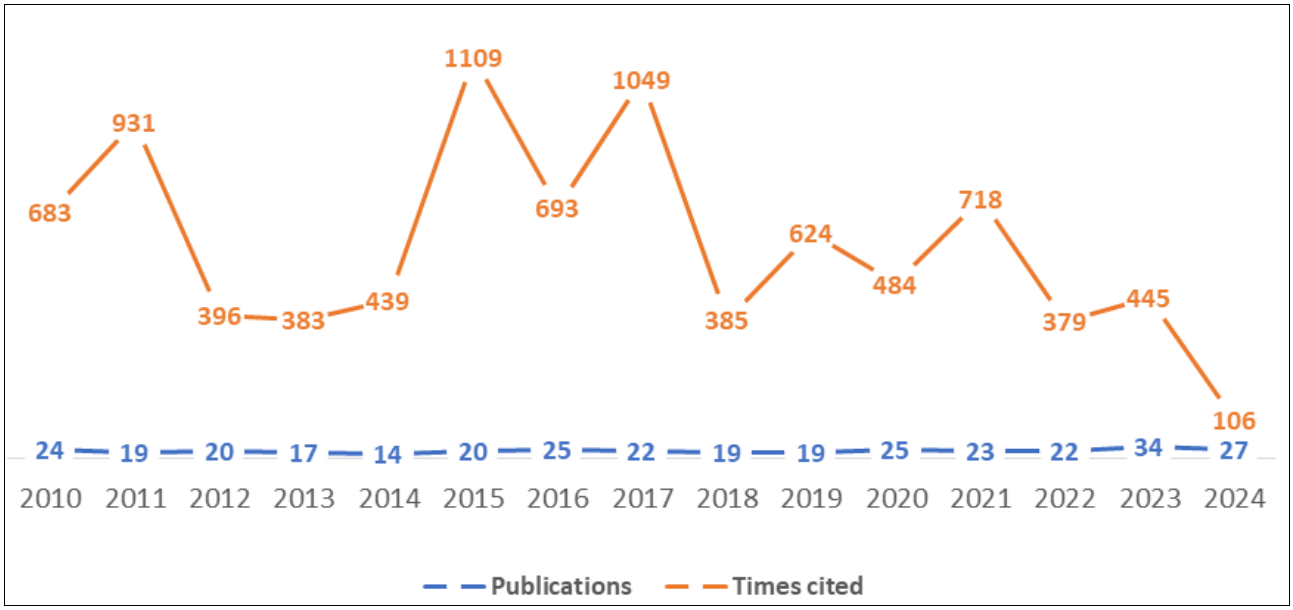


**Fig 2:** Times cited and publications over time

**Distribution of Publications and Citation Frequency per Year (2010-2024):** Figure 2 illustrates the yearly distribution of research articles and their citation frequencies from 2010 to 2024. This bibliometric analysis offers valuable insights into the development and impact of academic work in the specified area, showcasing significant trends in both research output and influence over time.

**Publication Trends**

The data shows a relatively stable level of publication over the 15-year span, with annual outputs varying between 14 and 34 pieces. Significant publishing activity is noted in 2016 (25 articles), 2020 (25 articles), and 2023, which reaches a peak of 34 publications. The rise in scholarly activity in recent years indicates an increasing academic interest in the topic, suggesting its lasting relevance and growing importance in the academic field. Overall, the years 2010 to 2024 reflect a consistent pattern of scholarly involvement, highlighting ongoing inquiry and discussion within the discipline. The steady publication volume, especially from 2015 onward, suggests that this research field has successfully sustained its academic trajectory.

**Citation Trends**

Citation frequency is an important metric for assessing scholarly impact and reception. The trends in citation reflected in the figure show considerable variations across different years. Peak values of 1,109 and 1,049 citations in 2015 and 2017 respectively attest to these years being times of great influence and potential landmark contributions to the literature. Other notable citation figures include 931 in 2011, 718 in 2021, and 683 in 2010 demonstrating strong citation performance during both earlier and middle periods of the analysed timeline. However, a marked drop in citation frequency is evident post 2021, with an even sharper decrease to 106 citations in 2024. This decline could be attributed to the recent nature of these publications that, due to minimal exposure, have yet to accumulate meaningful citations.

**Distribution of Articles Based on Source Journals**

Table 1 illustrates how the 335 research articles analysed are distributed among the top 10 journals, highlighting their role in disseminating scholarly work related to the selected research area.

The International Journal of Production Economics tops the list with 35 articles, accounting for 10.45% of the total dataset. This emphasizes the journal's crucial role in publishing high-quality research on production economics, supply chain cost management, and other related themes. Following closely, the International Journal of Production Research ranks second with 23 articles (6.87%), reinforcing its significance in operations and supply chain research.

Additionally, the International Journal of Logistics Systems and Management and the Journal of Cleaner Production rank prominently, showcasing 17 (5.07%) and 16 (4.78%) articles, respectively. The latter reflects a growing scholarly interest in sustainable and eco-friendly production practices. The Proceedings of the International Conference on Industrial Engineering and Operations Management holds the fifth position with 15 publications (4.48%), demonstrating the importance of conference proceedings in presenting innovative contributions to industrial engineering and operations.

Moderate representation is observed in journals like Production and Operations Management, Omega (UK), and the International Journal of Supply Chain Management, each featuring 5 to 6 articles (1.49%-1.79%). The Journal of Manufacturing Technology Management and the Journal of the Operational Research Society round out the list, each with 4 articles (1.19%).

This distribution reveals a concentration of research in a select few prominent journals, while a broader array of other sources offers smaller contributions. The trend indicates that researchers tend to favour high-impact journals that concentrate on their specific fields, highlighting the importance of journal quality in the sharing of academic work.

**Table 1:** Frequency of articles published by the top 10 Journals

| Rank | Source | Record Count | Percentage (%) |
|---|---|---|---|
| 1 | International Journal of Production Economics | 35 | 10.45% |
| 2 | International Journal of Production Research | 23 | 6.87% |
| 3 | International Journal of Logistics Systems and Management | 17 | 5.07% |
| 4 | Journal of Cleaner Production | 16 | 4.78% |
| 5 | Proceedings of the International Conference on Industrial Engineering and Operations Management | 15 | 4.48% |
| 6 | Production and Operations Management | 6 | 1.79% |
| 7 | Omega (United Kingdom) | 5 | 1.49% |
| 8 | International Journal of Supply Chain Management | 5 | 1.49% |
| 9 | Journal of Manufacturing Technology Management | 4 | 1.19% |
| 10 | Journal of the Operational Research Society | 4 | 1.19% |

**Distribution of articles based on Countries**

The distribution of published articles by country is illustrated in Figure 3, showcasing the top 10 nations that contribute most significantly to the knowledge in this field. Leading the list is the US with 71 publications, which represents approximately 21.19% of the total articles assessed (N = 335). This prominent position underlines the country's extensive research infrastructure and academic focus on the subject.

India takes the second spot with 56 articles (16.72%), indicating a growing academic interest from emerging markets. Following closely is China with 38 publications (11.34%), reflecting its rapid progress in supply chain technology and research initiatives. Despite facing regional constraints, Iran has made a notable impact with 28 articles (8.36%). The UK ranks fifth with 21 publications (6.27%) and maintains its status as a traditional hub for academic research. Other significant contributors include Italy (15 articles, 4.48%), Australia (18 articles, 5.37%), and Germany, Canada, and Indonesia, each with 14 articles (4.18%). The inclusion of both developed and developing nations among the leading contributors underscores the worldwide relevance and appeal of this research topic. This geographical distribution not only illustrates the global scope of the research domain but also highlights the collaborative and diverse scholarly discussions surrounding it.

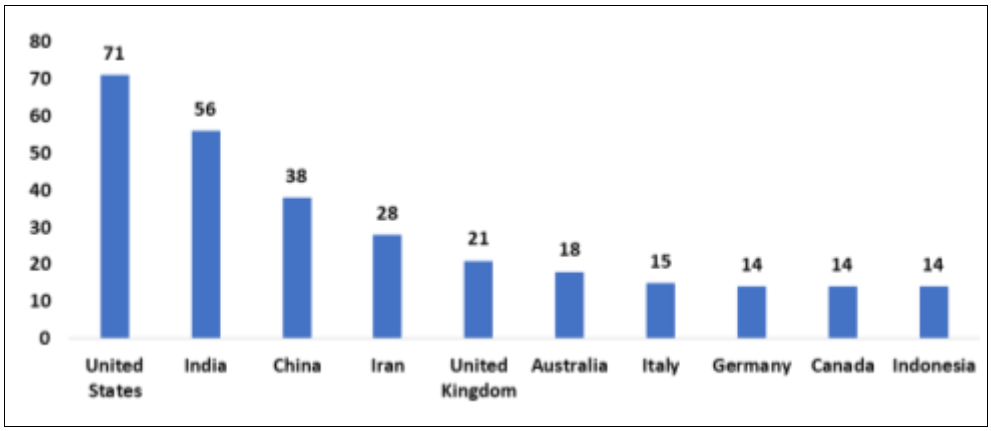


**Fig 3:** Country wise Paper Publications of top 10 countries

**Analysis of Source Types**

The analysis of source types within the 335 documents shows a clear inclination towards journal articles, which make up 79.40% of the total. The table 2 highlights the reliability, thoroughness, and academic focus that journal articles have in scholarly circles.

Conference proceedings come in as the second most prevalent source, representing 13.13% of the documents. This suggests a significant input from cutting-edge research that is often shared at conferences prior to being published in journals. Books make up 4.48% of the total, emphasizing their ongoing importance in providing comprehensive and detailed examinations of the subject. Meanwhile, book series and trade journals account for only 1.79% and 1.19%, respectively, indicating their limited representation. The scarcity of trade journals suggests that literature aimed at practitioners or the industry plays a minimal role in this research context.

In summary, the data clearly indicates that the literature is heavily tilted towards academic sources, with journals being the primary medium for sharing knowledge. This trend illustrates the field's strong alignment with peer-reviewed and empirically validated research outcomes.

**Table 2:** Distribution based on the type of Publication

| Source Type | Documents | Percentage (%) |
|---|---|---|
| Journal | 266 | 79.40% |
| Conference Proceeding | 44 | 13.13% |
| Book | 15 | 4.48% |
| Book Series | 6 | 1.79% |
| Trade Journal | 4 | 1.19% |

**Analysis of Publication Sources**

An examination of the publisher distribution among the chosen articles (N = 335) indicates a substantial concentration of research outputs within a limited number of prominent publishing houses. This suggests both the reliability of the sources and a centralization of scholarly

conversation within a select few academic platforms.

Elsevier stands out as the most influential publisher, with 77 publications, which constitutes around 23% of the entire dataset. Following it is InderScience Publishers, responsible for 36 articles (11%), Taylor & Francis with 30 articles (9%), and both Emerald Publishing and Springer, each contributing 26 publications (8%). The IEEE adds 9 articles (3%). These statistics underscore the significant role that established international publishers play in sharing research on supply chain cost management and competitive advantage.

Other key players include the IEOM Society with 13 articles, IGI Global with 6, Academic/University Presses contributing 6 as well, Exceling Tech with 5, and Growing Science with 3. Additionally, a few articles from Wiley, MDPI, Palgrave, and Virtus Interprets range between 2 and 4 publications each.

A category termed "Others" represents 80 articles, accounting for almost 24% of the total dataset. This group encompasses a varied collection of less common publishers, conference proceedings, independent academic platforms, and possibly region-specific outlets. The high number in this category reflects a strong diversity in the research environment and the existence of emerging or less conventional channels for academic exchange.

In summary, the significant volume of articles published by major players like Elsevier, Springer, and Taylor & Francis highlights the scholarly rigor and the impactful nature of research in this field. At the same time, the input from smaller or emerging publishers indicates a widening scope and increasing academic engagement in subjects related to supply chain management and strategic cost approaches.

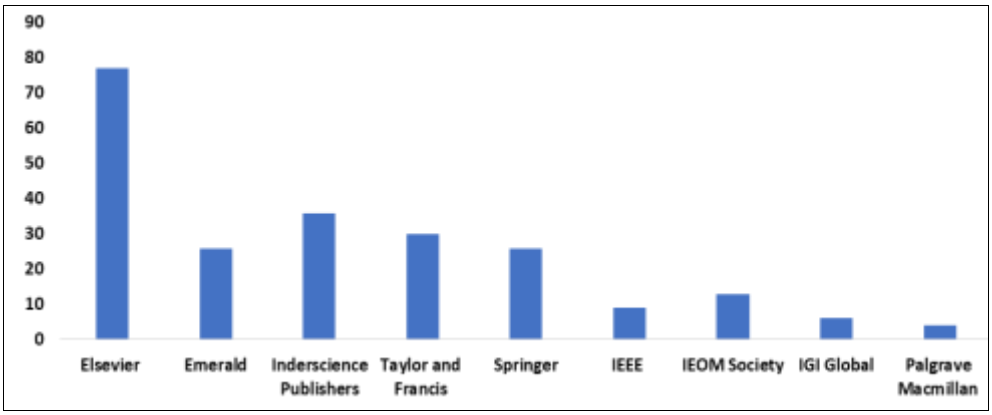


**Fig 4:** Papers based on top 10 Publishers

**Distribution of Papers Based on Authors**

An examination of contributions by various authors highlights significant patterns in the publication efforts concerning logistics and supply chain cost management. Among those assessed, Abdelraheem, Abubkr Ahmed Elhadi stands out as the most active contributor, having published 8 papers, which clearly places him ahead of others in the dataset. This suggests he maintains a consistent research interest and is highly engaged in this area.

A group of seven authors-Abduh, Muhamad; Abedian, Mansour; Aboutalib, Zineb; Acar, Yavuz; Accorsi, R.; Adegbola, Kehinde; and Agard, Bruno-each produced 3 documents, indicating their moderate yet active involvement in the subject. In contrast, Aggarwal, K.K. and Aghsami, Amir has each written 2 publications, showing a lower, though still significant, level of participation.

This reveals that most authors submitted a modest number of papers (3), a pattern often observed in collaborative and interdisciplinary research fields like supply chain management. The prominent contribution by Abdelraheem may indicate a specialization or a leadership role within a research community or network.

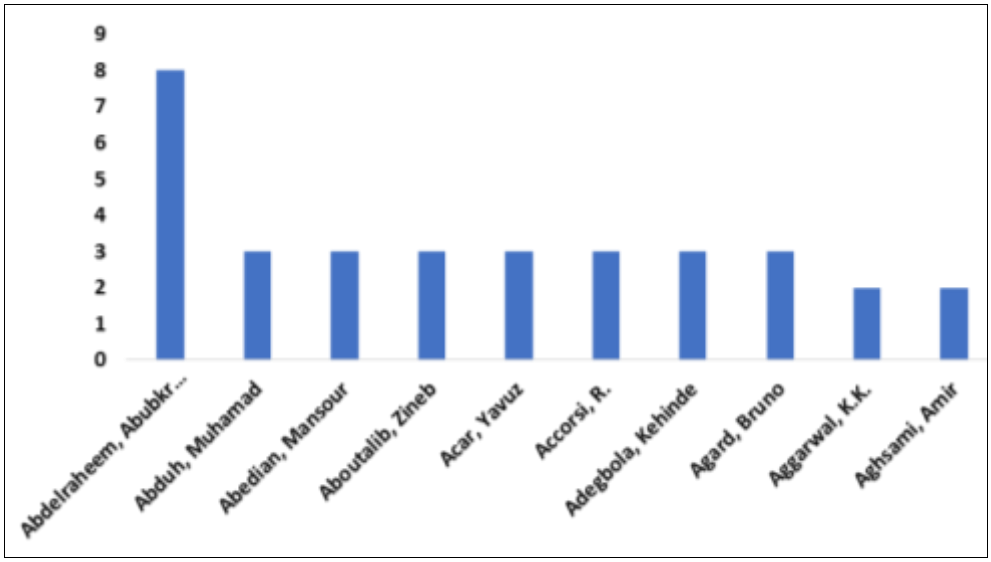


**Fig 5:** Distribution of papers based on authors

**Bibliometric Analysis of Included Papers**

The authors conducted a bibliometric analysis on 335 academic papers to study supply chain research trends and focused subjects. Researchers performed text mining on keywords to identify patterns of term appearances and their connections throughout the academic papers. They initially extracted 1121 different keywords from the documents. The analysis included keywords that appeared at least two times to maintain focus and relevance. After elimination only 191 keywords survived which passed the established criteria. The analysis progressed with additional cleaning which uncovered four duplicate instances thus reducing the total counted keywords to 187 for examination.

**Visualizing Keyword Co-occurrence**

The figure 6 shows a VOSviewer-generated network representation depicting keywords through circles. The visual size of circles shows keywords' frequency while their spatial relation demonstrates co-occurrence strength because closely arranged terms appear together often in works. Supply chain research shows six significant thematic areas through different coloured clusters in the generated map. The clusters show which terms closely group together while displaying the research field connections between different areas. Supply Chain and Supply Chain Management terms emerge as prominent forces in the visualization with 45 occurrences each thus showcasing their essential position while indicating their use as general headers to cover multiple sub-topics. Researchers along with practitioners maintain "Supply Chain Cost" and "Inventory Management" as two principal areas which primarily focus on cost-related optimization and inventory control respectively. The term "sustainability" occurs frequently in the study because supply chain management practices now emphasize environmentally conscious operations and social responsibility. Computational and modelling methods demonstrated through "Simulation" and "Genetic Algorithm" show how to resolve intricate supply chain difficulties. The strategic decision areas of "Supplier Selection" and "Supply Chain Network Design" demonstrate an approach to enhance operational efficiency while building structural design.

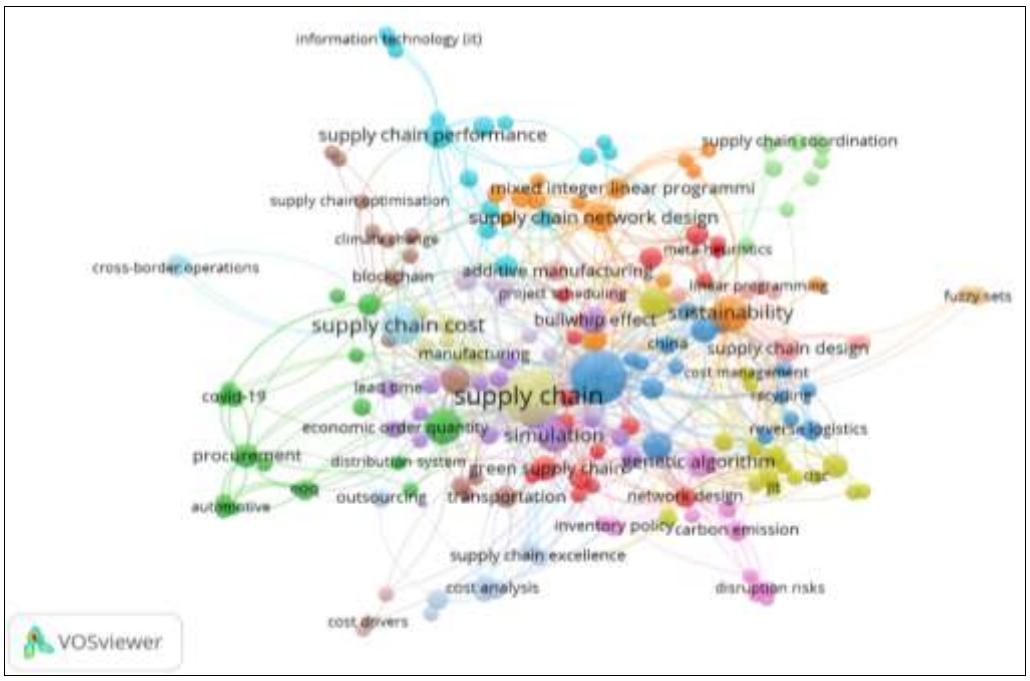


**Fig 6:** Bibliometric map created based on author keywords co-occurrence

**Co authorship based on countries**

Research dynamics worldwide require the examination of international collaboration to measure the extent of co-authorship between different nations. Only countries with at least one publication and five citations per country were included in the analysis of influential collaborative research. The analytical framework included 49 of the total 57 countries that met the set requirements. The visual presentation depicts the international cooperation between countries through co-authorship relationships. The visualization displays countries through nodes stand for nations and their sizes show publication numbers whereas link strengths between nations appear as line thickness along with connection counts. The United States demonstrated its position as the leading power through 71 publications that accumulated a total of 2353 citations while achieving 49 link strength which demonstrated its strong connections with multiple international partners. Research publications and scholarly connections of India demonstrated strength and international growth through 56 articles and 1491 citations supported by 21 link strengths. The growing influence of China in global supply chain research is demonstrated through its 38 published papers which accumulated 933 citations and reached a link strength total of 22. With 21 research publications in supply chain management the United Kingdom generated 1111 citations while demonstrating a strong collaboration potential through its link strength of 30.

A total of 18 nations participates in global supply chain research with Australia (link strength: 19), Iran (17), South Korea (16), Germany (15), Canada and France (11 each), Finland, Hong Kong, Netherlands and Spain (8 each) being especially prominent. Other participating countries in the research study demonstrated moderate link strengths below 7 which indicated their significant research contribution.

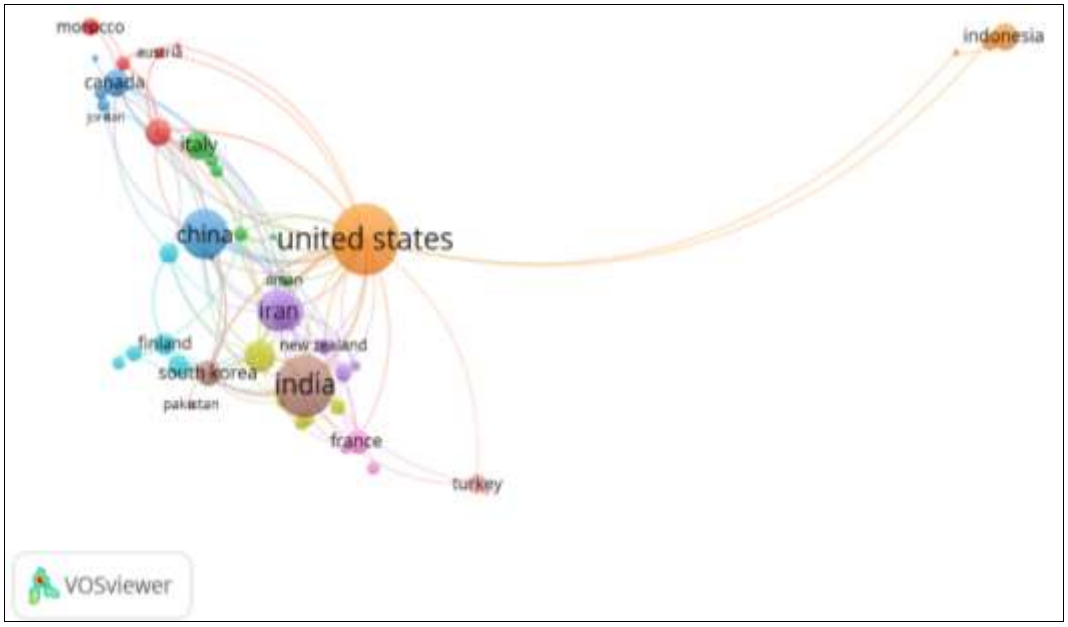


**Fig 7:** Bibliometric map created based on co-authorships based on countries

**Citation Analysis Based on Documents**

Research activity stands primarily measured through publications but the actual quality and impact of research outcomes cannot be reliably determined by it. The wide range of scholarly impact between articles in literature makes citation measurement the better methodology to evaluate both academic significance and publishing value of academic work.

The research utilized a five-citation minimum requirement as its research parameter to identify only impactful documented studies. The research investigated 335 scholarly papers where 202 of them satisfied the requirement for analysis. A small yet important network of 13 documents appears in the figure 8 illustration below since these papers established direct citation relationships. The paper by Mao (2015) [148] leads all papers with 371 citations yet demonstrates no direct link strength which indicates its unsurpassed influence despite lacking connections towards other documents in this dataset. The study conducted by Mirzapour Al-e-Hashem (2011) [156] demonstrates limited citation relations based on its 337 citations and link strength value of 1 with other included articles. Meherishi (2019) [153] with a citation count of 228 remains a significant paper while maintaining zero strength in its link connections. Within the network Fahimnia (2017) [76] holds 1 link strength based on 218 citations but Mafakheri (2011) [144] has 215 citations with zero link strength and Battini (2014) [31] presents 214 citations connected to three links then Varsei (2017) [256] exhibits 191 citations through two links before Sarkar (2016) [217] stands as the most interconnected paper with a link strength of 5.

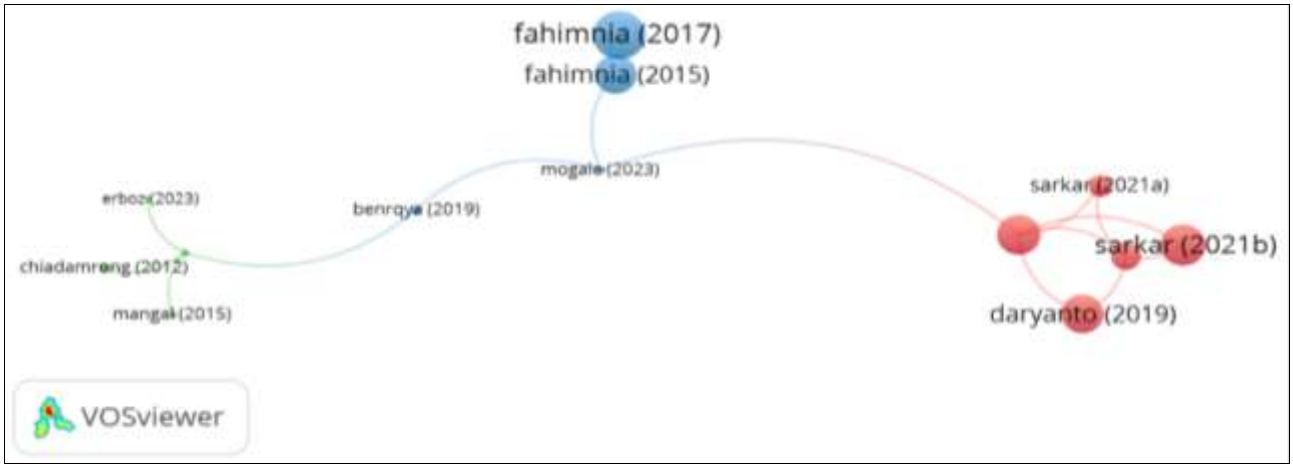


**Fig 8:** Bibliometric map created based on Citation analysis of papers

**Conclusions and Future Research Directions**

The global research published on Supply Chain Cost Management underwent an extensive bibliometric analysis that exposed major trends and key publications from important contributors to emerging research fields across worldwide studies. This review examines 335 peer-reviewed papers from which important insights were gathered about Supply Chain Cost Management development from 2010-2024.

Academic interest in SCCM grew intensely strong during the two previous decades based on research findings. The growth of cost reduction strategies used in supply chains together with procurement management and digital innovation created more research interest for supply chain

management. Research publications mainly emerge from the United States and China and India and the United Kingdom and the three nations contribute significantly to discoveries and findings in research-based fields. Established economies and developing economies already show intense research activity yet researchers across all corners of the world possess fresh possibilities to participate more.

Six main clusters of topics appear in SCCM literature according to keyword co-occurrence analysis data. Supply chain cost management encompasses three critical areas that include supply chain integration teamed with inventory optimization and supplier selection together with simulation-based decision-making and green and sustainable supply chain management. The field shows its evolution through its reliance on terms which include "genetic algorithm" and "blockchain" and "resilience" together with "sustainability" to capture technological advancements and sustainable cost management practices.

The collaborative network assessment reveals numerous active research communities which have limited inter-network interaction at both domestic and international levels. Multiple studies analysed through research network methods have achieved significant recognition while several influential articles remain unintegrated which suggests future possibilities to improve academic connections among researchers.

In light of the findings, several key avenues for future research in SCCM are proposed:

**Technological integration for real time cost optimisation**

Research needs to study how supply chain digitization requires the implementation of Artificial Intelligence (AI), Internet of Things (IoT), Machine Learning and blockchain for real-time supply chain cost management systems. Such technologies strengthen supply chain transparency functions alongside enhanced decision accuracy as well as traceability abilities for multi-step supply chains.

**Sustainability-Oriented Cost Management**

The union between cost management strategies and sustainability concerns along with environmental challenges has become an essential priority. Future investigations must establish how supply chains can incorporate circular economy systems together with life cycle cost assessment and carbon footprint analysis. Analysis of business approaches linking profitability with environmental sustainability will serve as a vital foundation for achieving sustainable development goals (SDGs).

**Context-Specific Research in Developing Economies**

The academic research about this subject exists mostly in studies of developed nations. Studies regarding sustainable cost management practices need to examine developing and emerging economies specifically since these nations face distinct challenges from resource limitations and inadequate infrastructure and extensive informal markets.

**Resilience and Risk-Based Cost Structures**

Future research needs to concentrate on building supply chain resilience through cost strategies because worldwide market uncertainties have reached a critical level which COVID-19 and geopolitical conflicts and environmental disruptions failed to control. The study of cost relationships among redundant systems and shared risk mitigation along with stockpile management techniques will develop methods to make supply chains both reactive and stress-tolerant.

**SME-Focused Cost Management Strategies**

Smaller business operations that include both small and medium-sized enterprises work with minimal financial resources while lacking complex tools favored by bigger organizations. Research should create easy-to-scale cost-efficient supply chain control management approaches that focus on digital readiness and collaborative networks for SME businesses.

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