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ARTICLES

BIBLIOMETRIC ANALYSIS OF SCOPUS INDEXED JOURNALS OF THE SUPPLY CHAIN IN SMALL AND MEDIUM ENTERPRISE: 2015-2024

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ABSTRACT. The aim of this study is to investigate the field of supply chain (SC) in small and medium businesses (SME) over the past 10 years by means of a bibliometric analysis of papers released in Scopus-indexed journals. The approach applied is bibliometric analysis and scientific mapping. This study utilizes bibliographic data of indexed papers retrieved from the Scopus database. This work detects research clusters for topological analysis, identification of important research subjects, interrelations, and cooperation patterns using bibliometric techniques. According to the results, 804 papers were published between 2015 and 2024; a total of 12,109 citations were made to these papers, and with an average of 96.80 citations per year. With 2,293 authors from 72 countries having published works, co-authorship and international cooperation have grown. The leading publishing countries for SC in SME in Scopus-indexed journals include China, Indonesia, and India. This study solely covers papers from 2015 to 2024; we did not examine publications released prior to 2015. This study solely examined bibliographic data of publications; it did not examine the contents of papers, including titles, approaches, or other components. It also aids in identifying present areas of interest for research and possible paths of inquiry.

Keywords: Scopus indexed, bibliometric analysis, science mapping, supply chain, small and medium enterprises.

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1 BACKGROUND OF THE STUDY

Small and Medium Enterprises (SMEs) are recognized as vital contributors to national economic growth, particularly in emerging economies. Beyond their role in employment and income generation, SMEs facilitate economic diversification and reduce dependence on dominant sectors (Appiah et al., 2019). Moreover, SMEs serve as key drivers of entrepreneurship and innovation across all layers of society, from lower to upper economic classes (Dar et al., 2017; Imtiaz et al., 2023). However, in practice, SME actors often face significant challenges, including meeting high demand, managing risk, and sustaining operations under internal and external pressures (Manhart et al., 2020).

In response to these challenges, the adoption of supply chain (SC) practices has become increasingly relevant for SMEs. Recent studies have shown that SC management can help SMEs adapt to dynamic market conditions by enabling better consumer understanding, efficient organizational management, and the strategic use of technology to anticipate trends and meet market demand (Bhatti & Bhatti, 2019; Hossan Chowdhury & Quaddus, 2021). Over the past decade, the operational function has evolved into a broader strategic approach in the form of supply chain management (SCM), which emphasizes coordination, responsiveness, and performance across various organizational units (Yildiz & Ahi, 2022).

Traditionally utilized by large firms, supply chain strategies have been increasingly integrated with quality management (QM) systems to enhance logistics and operational efficiency (Lengnick-Hall et al., 2013). These strategies, when implemented effectively, improve not only internal performance but also competitive positioning (Phan et al., 2020). In the context of globalization, SMEs are likewise exposed to external pressures such as cost management, service quality, and delivery performance (Salam & Bajaba, 2023). As a result, the integration of supply chain practices has become essential for SME resilience and sustainability (Luthra et al., 2022).

To assess the development of SC research and its relevance to SME needs, bibliometric analysis offers a powerful methodological tool. It enables researchers to systematically analyze publication data, such as journal articles, conference proceedings, and grey literature, to map knowledge trends, identify influential authors and institutions, and uncover research gaps (Ellegaard & Wallin, 2015; Islam & Widen, 2023). Beyond identifying publication trends, bibliometric analysis can provide deeper insights by revealing emerging thematic clusters, interdisciplinary linkages, collaboration networks, and shifts in theoretical perspectives, thus offering a nuanced understanding of how supply chain research evolves in alignment with real-world SME challenges. With the growing availability of online databases, bibliometric studies have gained popularity among academics and policy makers for evaluating research landscapes and generating data-driven insights.

Numerous Scopus-indexed journals have emerged as key platforms for publishing high-quality SC research. These include Supply Chain Management: An International Journal, Journal of Supply Chain Management, Journal of Humanitarian Logistics and Supply Chain Management (JHLSCM), Uncertain Supply Chain Management (USCM), Supply Chain Forum (SCF), and

Brazilian Journal of Operations & Production Management (BJOPM). Within these journals, bibliometric studies have examined diverse themes such as green supply chain management (Fahimnia et al., 2015), supply chain finance (X. Xu et al., 2018), reverse logistics (Kazemi et al., 2019), Internet of Things in logistics (Rejeb et al., 2020), supply chain transparency (Montecchi et al., 2021), and blockchain-based logistics (Musigmann et al., 2020; Maditati et al., 2018).

While SC bibliometric studies have grown significantly in recent years, none has specifically focused on the intersection between supply chain management and SMEs. Between 2015 and 2024, a search of the Scopus database reveals 685 publications on SC-related bibliometric analysis and 804 publications addressing SMEs and SC. However, no bibliometric analysis has yet examined SC in SME contexts. This gap presents a compelling opportunity for inquiry, as understanding SC dynamics in SMEs is critical for both academic development and policy formulation. Therefore, this study aims to fill this gap by conducting a comprehensive bibliometric analysis of SC related publications in the context of SMEs using data from Scopus-indexed journals from 2015 to 2024. Beyond identifying publication trends, this research seeks to reveal thematic evolutions, institutional collaborations, and geographic distribution of research in order to inform future studies and support the strategic advancement of SC practices within SMEs.

2 OBJECTIVES OF THE STUDY

By use of bibliographic data analysis of publications from a given indexer, one can better grasp the path of that indexer and assist in the identification of appropriate publication venue for their work. Therefore, the primary goal of this work is to perform a bibliometric analysis of Scopus in order to investigate its publishing trend for the past ten years, 2015 to 2024. To achieve this objective, we have also proposed several research questions (RQ).

RQ1. How many supply chain publications in SME have been published in Scopus since 2015?

RQ2. Who are the productive writers and which countries are represented in the writers' institutions?

RQ3. How are the main research themes in supply chain studies on SMEs represented based on keyword co-occurrence analysis in Scopus-indexed publications?

RQ4. Which Documents (references) and journals are the most cited and used in Scopus?

RQ5. What are the structures and patterns of scientific collaboration in supply chain research on SMEs, as revealed through co-authorship, co-citation, and country collaboration analysis using Scopus bibliometric data?

We divided our research into two parts to answer these RQ. In the first part, a bibliometric analysis was used to examine the bibliographic information of each publication since 2015. Over the past tes years, we have analyzed Scopus publications because this indexer has published many important works and has been included in many rankings, such as SCImago and Google Scholar Metrics. In addition, the indexing and ranking of these journals is increasingly improving, as shown by the Scopus CiteScore Tracker. The purpose of the second part is to provide an

overview of the scientific mapping of these publications. Bibliometrix software, which includes bibliographic coupling and interactive visualization for literature data, was used to perform scientific mapping (Zhu et al., 2024). Data acquired from Web of Science, Scopus, Dimensions, Lens.org, Cochrane Library, and PubMed can be seen and handled with this program.

3 REVIEW OF RELATED LITERATURE

Bibliometric analysis has become a prominent method in evaluating research productivity and intellectual structures across disciplines (Donthu et al., 2020). This approach utilizes statistical and mathematical techniques to examine the bibliographic metadata of scholarly publications such as citation counts, author networks, co-authorship patterns, and journal influence scores (Baker et al., 2020; Donthu et al., 2021). It enables researchers to map topic evolution, highlight cross-disciplinary linkages, and identify the most influential contributors in a given field. As bibliometric methods gain traction, various studies have applied them to examine trends in supply chain (SC) research, business, innovation systems, and family enterprises, among others.

Within the SC field, several bibliometric analyses have been conducted. For example, Fahimnia et al., (2015) investigated more than 1000 articles related to green supply chain management (GSCM) and identified thematic trends and prolific scholars. Similarly, Xu et al., (2018) focused on supply chain finance, conducting a systematic review and bibliometric assessment of this subdomain. Feng et al., (2017) analyzed 548 studies on corporate social responsibility (CSR) within supply chain management, while Mishra et al., (2018) examined the intersection of Big Data and SC practices based on 286 papers. S. Xu et al., (2020) contributed to this stream by analyzing over 1300 publications regarding SC disruption risks. More broadly, studies such as Khan et al., (2021), Liu et al., (2015), and Tunger & Eulerich, (2018) explored bibliometric applications in other business subfields.

Despite the growing body of bibliometric research in SC, a critical gap remains: none of these studies systematically examine supply chain literature in the context of Small and Medium Enterprises (SMEs). While SC practices are increasingly recognized as vital for SME sustainability and competitiveness (Salam & Bajaba, 2023; Luthra et al., 2022), bibliometric assessments have largely overlooked this intersection.

This study addresses this critical oversight by focusing explicitly on SC research within SME contexts using Scopus-indexed publications from 2015 to 2024. Using the literature review structure proposed by Snyder, (2019), which consists of three iterative stages input, processing, and output, we filtered relevant literature, conducted targeted analysis, and synthesized emerging patterns. As emphasized by Snyder, (2023), this method allows researchers to define clear research goals, evaluate literature quality, and frame the contribution of their review. By doing so, we not only document publication trends but also uncover research gaps, underexplored themes, and opportunities for advancing SC research tailored to SME needs.

Table 1 – Summary of Key Bibliometric Studies Related to Supply Chain and Business Domains.

Study	Scope	Method	Key Findings	Identified Gap
Fahimnia et al. (2015)	Green supply chain management (GSCM)	Bibliometric + systematic review	Identified GSCM themes, top authors, and institutional collaborations	No SME-specific focus
Feng et al. (2017)	CSR in supply chains	Bibliometric + keyword analysis	Traced 548 articles; mapped ethical practices in SC	Limited applicability to SME environments
Xu et al. (2018)	Supply chain finance	Systematic + bibliometric review	Summarized SCF evolution; identified influential works	Focused on finance, not SME application
Mishra et al. (2018)	Big Data and SC	Bibliometric + content analysis	Reviewed 286 articles; identified data challenges in SC	Did not address SME use of big data in SC
Xu et al. (2020)	Risk and disruption in SC	Bibliometric review	Analyzed 1310 publications on SC disruptions and resilience strategies	Focused on large-scale industrial SCs
Khan et al. (2021)	Journal special issues	Bibliometric analysis	Evaluated the impact of special issues in Journal of Business Research	Focused on journal impact; not SC specific
Tunger & Eulerich (2018)	Corporate governance	Custom bibliometric framework	Mapped business research in German-speaking countries	Not focused on SC or SMEs
Liu et al. (2015)	Innovation systems	Visualization + bibliometrics	Mapped intellectual evolution of innovation studies	Not related to supply chain or SMEs
Cisneros et al. (2018)	Family business succession (1939–2017)	Author network analysis	Traced co-authorship and research progression	No connection to SC research
Baker et al. (2021); Guan et al. (2024); Mitha & Omarsaib (2024)	Risk research, futures markets, education libraries	Bibliometric overview	Provided long-term overviews and journal performance mapping	General overviews without SC-SME integration

The reviewed studies provide valuable insights into how bibliometric methods have been used to explore SC subfields, journal impact, and interdisciplinary evolution. However, none of these works examine SC research through the lens of SMEs, despite SMEs being a crucial economic

driver, especially in emerging economies (Appiah et al., 2019). As such, this study contributes to filling this empirical and methodological gap by offering a targeted bibliometric analysis of SC-related research in SMEs using Scopus-indexed sources. In doing so, it not only extends the scope of existing SC bibliometric work but also informs practitioners and policymakers on the evolution, gaps, and potential of SC strategies specifically within the SME sector.

4 METHODOLOGY

Two stages of data analysis were undertaken in this study. The first stage involved a bibliometric study of 804 papers indexed in Scopus and published between 2015 and 2024. The second stage involved scientific mapping to analyze thematic and keyword trends within these publications. Data collection was performed by querying the Scopus database, supplemented by Scimago Journal Rank (SJR) to ensure the journals' credibility and indexing status. The mapping technique used in this study plays an important role in identifying the most dominant keywords that have been the main focus in previous publications. This is due to the fact that keywords in an article generally reflect the core substance of the article, so that the frequency of occurrence and the relationship between keywords can be an indicator of topics that receive attention in the field (Chen et al., 2016).

The study selection followed a clear and structured protocol adapted from the PRISMA guidelines, visualized in Figure 1. Initially, 804 records were identified through the Scopus database search. Due to the focused nature of the query and precise database settings, duplicate removal was not applicable. Subsequent screening for eligibility based on inclusion criteria such as publication type (journal articles, conference proceedings, and grey literature), language (English), publication period (2015-2024), and relevance to supply chain research resulted in no exclusions, thus maintaining the original dataset of 804 articles. Full-text assessment was conducted on all 804 articles to confirm their relevance and alignment with the research objectives, resulting in no additional exclusions. Consequently, all 804 articles were included in the final analysis.

4.1 Bibliographic analysis

This study adopted a bibliometric approach to analyze 804 publications indexed in Scopus between 2015 and 2024, focusing on supply chain (SC) research in the context of Small and Medium Enterprises (SMEs). Scopus was chosen due to its comprehensive coverage of peer-reviewed journals, conference proceedings, and book chapters. The data were retrieved using keyword combinations such as "supply chain" AND "SME" or "small and medium enterprises" and were exported in both CSV (Excel) and BibTeX formats. Metadata fields including authors, titles, abstracts, affiliations, keywords, references, and citations were retained, while non-essential fields such as article numbers, DOIs, ISSNs, and correspondence addresses were excluded from analysis. As shown in the PRISMA flow diagram, no duplicate records were found or removed, and all 804 records were screened and assessed for eligibility based on the inclusion criteria: English language, peer-reviewed publications (articles, reviews, conference papers), and

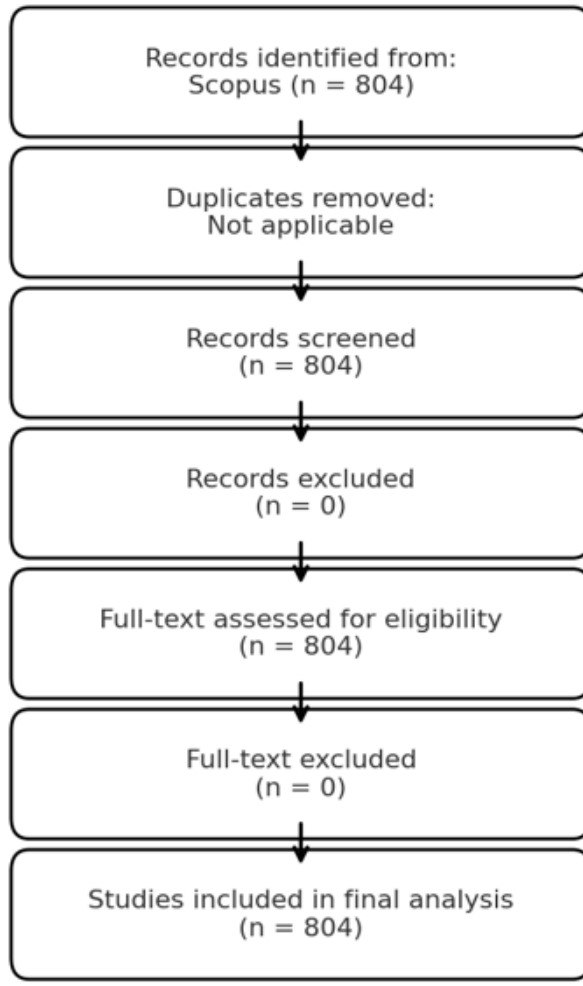

Figure 1 – PRISMA Flow Diagram – SC in SME Bibliometric Study.

explicit discussion of both SC and SME. Documents such as editorials, notes, and non-English publications were excluded. After full-text eligibility checks, all 804 records were included in the final analysis. The analysis was conducted using the Bibliometrix R-package via the Biblioshiny interface, allowing for visualization of publication trends, co-authorship and institutional collaboration networks, keyword co-occurrence, co-citation mapping, and bibliographic coupling. To ensure the validity and reliability of the results, keyword fields were cleaned manually in Excel prior to analysis, and network structures were cross-validated using VOSviewer. This rigorous, systematic, and transparent approach provides a robust foundation for mapping and interpreting SC research in SME contexts.

4.2 Scientific mapping through visual analysis

Scientific mapping analysis of bibliographic data is the focus of the second part of SC publication analysis in SME. Bibliometrix program imports BIB files to produce maps depending on bibliographic information of a particular publication. Visualization is facilitated by maps of co-authorship, references, bibliographic mergers, and co-occurrence of keywords. This procedure shows the several scientific players in the field of SC in SME: countries, international partners, authors, keywords, Scopus reference publications that interact.

4.3 Data analysis

We investigated publications quantitatively in order to respond to the RQ. We specifically looked at publication count, authorial style, and citation trends as well as collaboration tendencies. We also found successful authors and nations, the most often referenced papers, and showed bibliometric networks of 804 publications.

4.4 Number and types of publications

We computed the annual count of articles for every year after examining the overall volume of papers released between 2015 and 2024 in all publications relevant to SC in SMEs. Figure 2 illustrates the annual distribution of Scopus-indexed scientific publications related to Supply Chain in the context of Small and Medium Enterprises from 2015 to 2024. Based on the compiled data and analysis, a total of 804 articles were published over the ten-year period. The number of publications shows a significant upward trend, particularly after 2018. The early years recorded relatively low and stable figures, with 41 articles in 2015, 42 in 2016, and a decline to 32 in 2017. However, the number began to rise in 2018 (49 articles), followed by a sharp increase in 2019 (88 articles) and 2020 (99 articles). After a slight dip in 2021 (92 articles), the trend rose again, reaching its peak in 2023 with 139 publications, the highest during the analysis period. In 2024, the number decreased to 103 articles, though it remained significantly higher than in the early years. These figures reflect a growing interest and research activity in the field of SC in SMEs, particularly over the past five years.

4.5 Average citation per year

Table 2 shows the number of citations of all articles from 2015 to 2024, where the average total citations per article over a 10-year period shows the number of citations made previously. In 2020, the average total citations per article was the highest at 29.19, while in 2024 it was the lowest, at 3.21. This can also be seen from the average total citations per year shown in Table 2, where in 2020 the average total citations per year was the highest at 5.84, while in 2016 the average total citations per year was the lowest at 1.67.

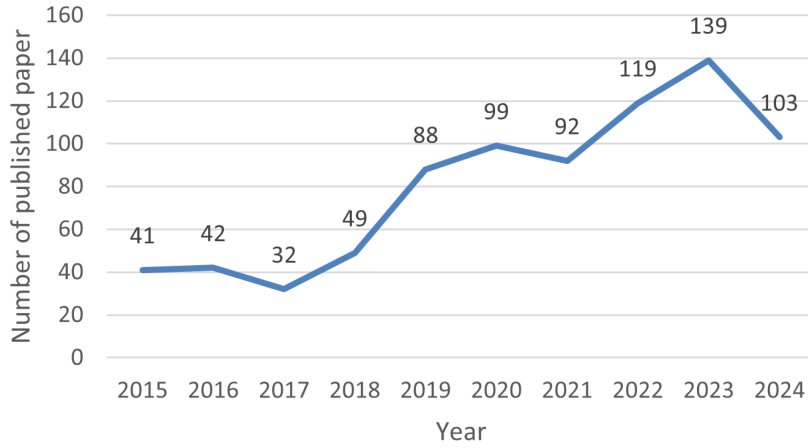

Figure 2 – Publishing trend in the area of Supply Chain in Small and Medium Enterprises.

Table 2 – Average citation per year.

Year	MeanTCperArt	N	MeanTCperYear	CitableYears
2015	26.68	41	2.67	10
2016	15.07	42	1.67	9
2017	23.69	32	2.96	8
2018	23.69	49	3.38	7
2019	17.76	88	2.96	6
2020	29.19	99	5.84	5
2021	16.83	92	4.21	4
2022	11.73	119	3.91	3
2023	5.29	139	2.64	2
2024	3.21	103	3.21	1

4.6 Author influence

Table 3 outlines the top ten contributing authors and the number of papers they authored or co-authored.

Table 3 – The top 10 contributing authors and number of published articles.

Authors	Articles	Articles Fractionalized
KUMAR V	8	2.59
KUSRINI E	8	2.67
DEY PK	7	1.90
WANG Y	7	2.61
ALONSO A	6	0.59
COOSEMANS T	6	0.59
DEIX S	6	0.59
MEYER G	6	0.59
RATNA S	6	2.07
REEVES C	6	0.59

As can be seen in Table 3, Kumar and Kusrini have written 8 articles related to SC and SME. Dey and Wang have written 7 articles, and 6 other authors have written 6 articles related to SC and SME. In addition, there are 2,293 authors, either individually or collectively, publishing articles related to SC and SME from 2015 to 2024.

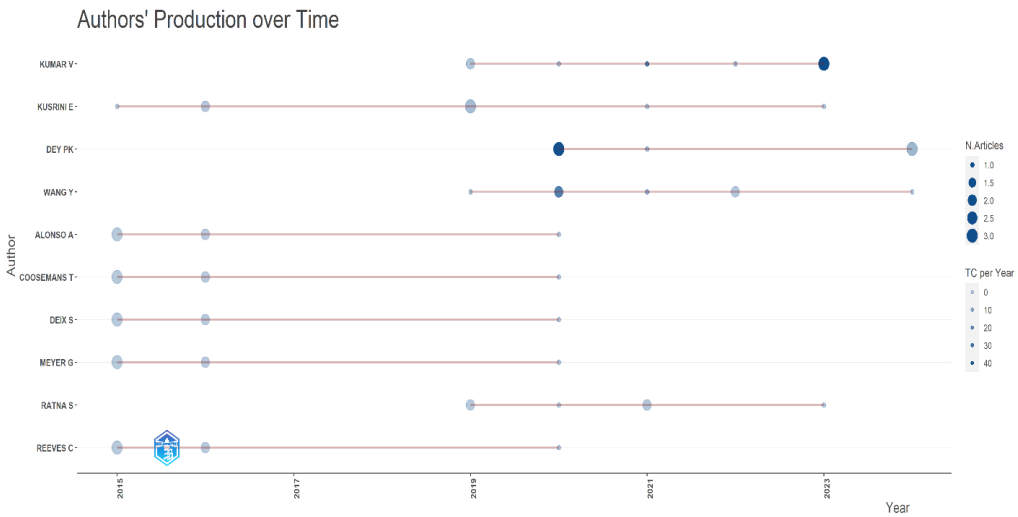

Figure 3 – Author production over time.

Figure 3 shows the number of publication frequencies of each author's writings in the period 2015 to 2024, where there are many gaps in several years. This shows that publications related to SC in SME are very few, so the number of articles that can be published by each author does not occur every year. Seeing the number of articles and the number of authors which are relatively far apart, where the number of articles published in that period is only 804 articles, while the number of authors alone or together in the article is more than 2,000 authors.

4.7 Geographic distribution of publications and collaboration

The geographical distribution of author institutions' countries is shown in Table 3 and Figure 4. Author information is collected from author affiliations in their publications in Scopus. Authors' place of birth or citizenship may differ from their country of institution. Table 3 shows that 804 publications in Scopus-indexed journals were published between 2015–2024. Nonetheless, a total of 2,293 authors from different nations contributed to these publications during the same period. For instance, even if the article itself is only one, it can be written by more than one author from various nations.

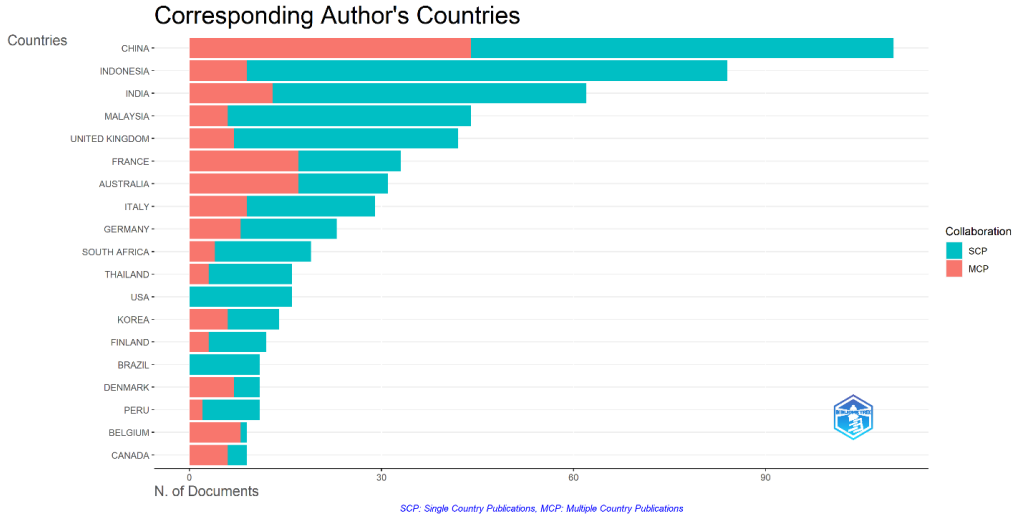

Figure 4 – The top 10 Corresponding Author's Countries.

Table 4 lists the author countries in order of author count from 2015 to 2024. Authors from 72 nations and 6 continents (Asia, Africa, Europe, North America, South America, and Australia/Oceania) from 2015–2024 have published various publication items in Scopus-indexed journals. China ranks first with 110 articles published during this period. Figure 4 also shows the Single Country Publications (SCP) and Multiple Country Publications (MCP) in each country to see the distribution of publications from 2015-2024. In addition, Table 5 shows the distribution of journals that published the most articles from 2015-2024. In particular, the journal Sustainability published the most articles related to SCM and SME, namely 25 articles.

Table 4 – The top 10 Corresponding Author's Countries.

Country	Articles	Single Country Publications (SCP)	Multiple Country Publications (MCP)	Freq	MCP_Ratio
CHINA	110	66	44	0.137	0.4
INDONESIA	84	75	9	0.104	0.107
INDIA	62	49	13	0.077	0.21
MALAYSIA	44	38	6	0.055	0.136
UNITED KINGDOM	42	35	7	0.052	0.167
FRANCE	33	16	17	0.041	0.515
AUSTRALIA	31	14	17	0.039	0.548
ITALY	29	20	9	0.036	0.31
GERMANY	23	15	8	0.029	0.348
SOUTH AFRICA	19	15	4	0.024	0.211

Figure 5 shows the top performing companies (based on paper contribution count) in relation to paper quantity. Examining this list against the top 10 contributing writers found in Table 4, we observe that Aston University, Hunan University, Universitas Islam Indonesia, Universiti Teknologi Malaysia, Chang Mai University, Universidad Peruana De Ciencias Aplicadas (UPC), Universiti Utara Malaysia, Amity University, Cardiff University and the School of Management are each represented by more productive authors. Thus, each university only needs one or two researchers publishing their papers to contribute positively to their university's performance. Figure 5 depicts the institutions that contribute the most to the scientific literature. This is important to show the research centers that are active in the field and can help in identifying collaboration networks or geographic/topical trends in scientific publications.

Table 5 – The top 10 Relevant Sources.

Sources	Articles
SUSTAINABILITY (SWITZERLAND)	25
INTERNATIONAL JOURNAL OF SUPPLY CHAIN MANAGEMENT	23
ANNALS OF OPERATIONS RESEARCH	15
UNCERTAIN SUPPLY CHAIN MANAGEMENT	15
JOURNAL OF CLEANER PRODUCTION	12
LECTURE NOTES IN MECHANICAL ENGINEERING	12
IOP CONFERENCE SERIES: MATERIALS SCIENCE AND ENGINEERING	10
PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON INDUSTRIAL ENGINEERING AND OPERATIONS MANAGEMENT	10
IOP CONFERENCE SERIES: EARTH AND ENVIRONMENTAL SCIENCE	9
PRODUCTION PLANNING AND CONTROL	9

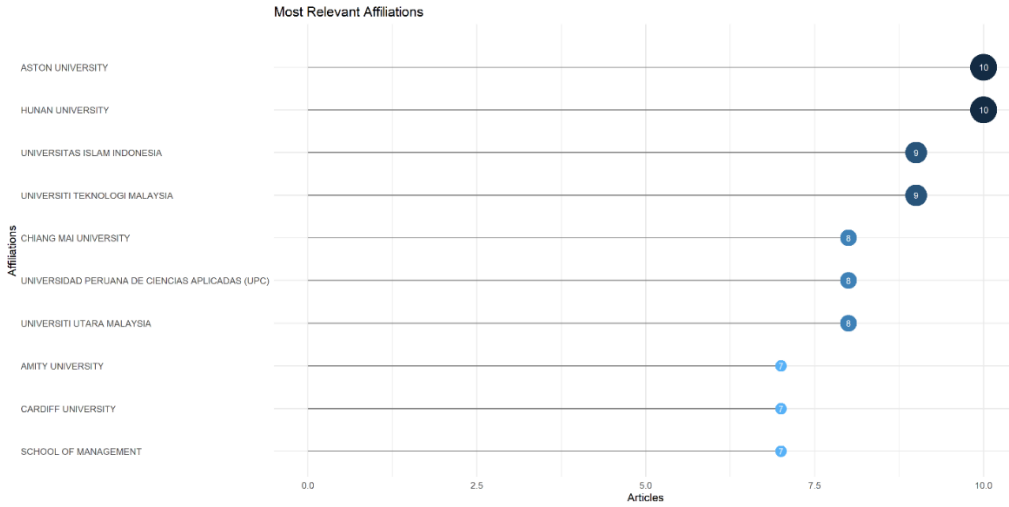

Figure 5 – The top 10 contributing organizations.

4.8 Citation analysis

Table 6 shows authors' citations received between 2015 and 2024. With an average total citation annual of 96,80, publications released in 2020 had the most citations (484). Over the ten-year period, 628 articles received a total of 12,109 citations, with each article cited at least once. With an average of 19.28 citations per publication, 176 papers lacked citations at all. This indicator divides the total number of papers published in a journal by the number of references a document acquired from another publication.

Table 6 – The top 10 Cited Documents.

Paper	Total Citations (TC)	TC per Year
WONG LW, 2020, Int. J. Inf. Manag.	484	96.80
CABALLERO-MORALES SO, 2021, Res. Int. Bus. Financ.	189	47.25
LU Y, 2020, Environ. HAZARDS	189	37.80
ÜNAL E, 2019, J. Manuf. Technol. Manag.	177	29.50
KHAN SAR, 2021, Ann. Oper. Res.	171	42.75
MANI V, 2020, Int. J. Prod. Econ.	160	32.00
HE F, 2018, J. Clean. Prod.	141	20.14
PRAUSE G, 2015, J. Secur. Sustain. ISSUES	133	13.30
ZHOU F, 2018, J. Clean. Prod.	131	18.71
ASHBY A, 2016, Oper. Manag. Res.	113	12.56

4.9 Science mapping analysis

Examining the paper titles and keyword lists helped identify the most frequently used terms or phrases. Table 7 compiles the top 20 terms utilized in the article titles. This comes from a pool of 2,669 keywords extracted from 804 papers. Clearly, the three most often occurring terms in table 7 reflect the search keywords chosen for this study.

Table 7 – The top 20 most used keywords in the publications.

Rank	Words	Frequency
1	supply chains	254
2	supply chain management	128
3	small and medium-sized enterprise	102
4	sustainable development	68
5	small medium enterprise	48
6	small and medium enterprise	40
7	decision making	38
8	commerce	37
9	competition	37
10	finance	36
11	sme	32
12	industry 4 0	31
13	manufacture	30
14	risk assessment	30
15	sales	30
16	sustainability	28
17	costs	26
18	small-and-medium enterprise	26
19	blockchain	22
20	supply chain finances	22

5 FINDINGS AND DISCUSSION

Bibliometric analysis was conducted on Scopus-indexed journal publications related to supply chains (SC) and small and medium-sized enterprises (SMEs) published from 2015 to 2024. By addressing five research questions (RQs), this study systematically mapped bibliographic data, highlighting publication trends, influential authors, frequently cited articles, key publishing institutions, and prevalent keywords. These insights offer a clear understanding of current research focal points and knowledge gaps, directly informing strategic decision-making processes for SMEs by identifying emerging themes, critical success factors, and relevant innovations in supply chain management.

More than 800 publications including articles on SC in SME have been published by Scopus-indexed journals since 2015. Among these publications, research articles account for the largest

number, followed by reviews and editorials. According to the ten-year impact study, research articles count has risen throughout time. It is abundantly evident throughout the previous years that research depends on communication and cooperation. Co-authorship facilitates the pooling of skills across publication fields, helps solve difficult problems, and sometimes makes publication easier. In addition, due to better internet connectivity and the advancement of synchronous information and communication technology tools, joint authorship has also increased. Researchers with several authors have reportedly produced more single-authored research publications according past studies (Ronda-Pupo and Katz, 2018). Analyzing the geographical distribution of publications and collaborations, we see that China-based author institutions have 110 publications in Scopus-indexed journals from 2015 to 2024, followed by Indonesia, India, Malaysia and the United Kingdom. This finding also supports other studies. For example, China, Indonesia, India, Malaysia and the United Kingdom are ranked highest as countries that show great interest in SC research in SME. From the analysis conducted, it can be seen that the top four countries that publish the most SC articles in SME are countries from Asia, where there are many SME in the country, which are then followed by other European countries. Authors from established in regions such as North America, Europe and Oceania as well as from developing nations in Asia and Africa including Indonesia, India, and Malaysia are clearly visible. Nonetheless, some of the most referenced writers from Asian emerging nations like Malaysia demonstrate how much SC in SMEs influences fieldwork in SC or SME research.

Examining the patterns of intra- and inter-country cooperation, we discovered that the tendency of intra-country research is expanding. Comparatively to intra-country cooperation, inter-country cooperation is somewhat poor. Still, the study reveals growing inter-country cooperation—in China, India, France, Australia, and so forth. This certainly indicates that inter-country collaboration may be a trend in all countries. If this trend continues, the diversity of SC and SME will increase because each country has a different SC and SME culture from its management.

Figure 6 presents a visual representation of the Collaboration Network among authors from various countries, reflecting the existence of diverse and widespread international research partnerships. Each cluster of nodes indicates a group of co-authors who have frequently collaborated, with denser and more connected nodes (e.g., Müller B, Alonso A, and Deix S) representing more prolific and central contributors in the field. This network highlights how research related to Supply Chain (SC) and Small and Medium Enterprises (SMEs) is not confined to individual efforts, but instead often involves cross-border and interdisciplinary collaboration. Over the last ten years, a total of 804 publications have been produced on this theme, with recurring research focuses on small and medium-sized enterprises, supply chains, and finance. The mapping suggests that the most active authors tend to form tightly connected clusters, indicating ongoing collaboration and thematic alignment in their research contributions.

Figure 7 illustrates the Countries' Collaboration World Map, highlighting the global research connections in the field of *Supply Chain* and *SMEs*. The visualization reveals that the continents of Asia, Europe, and America are central hubs of international collaboration, as indicated by the dense interconnecting lines between countries. Among them, China emerges as the most

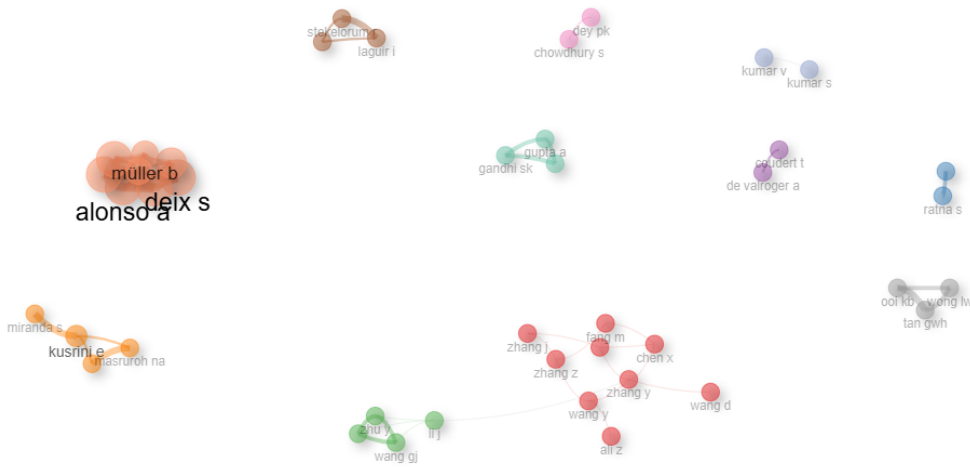

Figure 6 – Collaboration Network.

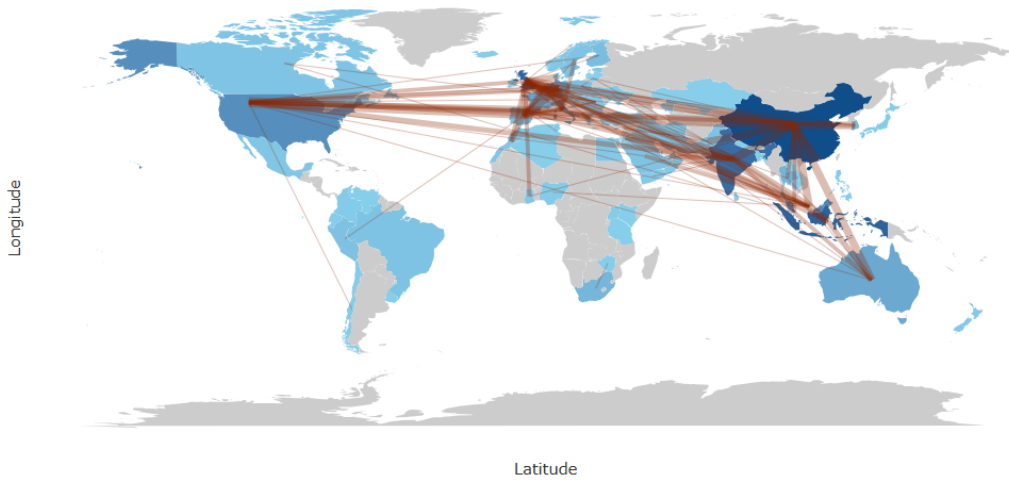

Figure 7 – Countries' Collaboration World Map.

prominent contributor, playing a key role in fostering collaborative research across various countries. The thick and numerous lines connecting China to Europe, Southeast Asia, and Oceania reflect its extensive academic partnerships. This global network demonstrates that cross-country and inter-institutional collaboration is crucial, not only in enhancing scientific output but also in facilitating resource sharing, funding opportunities, and broader dissemination of findings. The intensity and direction of the linkages underscore how research on SC and SMEs benefits from strong international cooperation, particularly among universities and research institutes.

Figure 8 presents a thematic network visualization showing the most frequently used keywords in publications related to Supply Chain (SC) in Small and Medium Enterprises (SMEs). The size

of each node (circle) indicates the frequency of keyword usage, where larger circles represent themes that appear most often in the literature. Central themes such as "supply chains," "supply chain management," and "small and medium-sized enterprise" dominate the network, indicating their centrality and relevance in the research field. Surrounding these core concepts are related but more specific themes like "digital transformation," "blockchain," "finance," "sustainability," and "risk management," each forming interconnected clusters. The color-coded nodes suggest groupings of similar subthemes, for example, green for financial and risk-related topics, red for sustainability and human factors, and blue for operational and technological topics. Meanwhile, smaller nodes, such as "artificial intelligence" or "life cycle", represent emerging or less frequently addressed areas. This thematic mapping highlights not only the dominant focus areas within SC and SME research but also potential gaps or opportunities for future exploration.

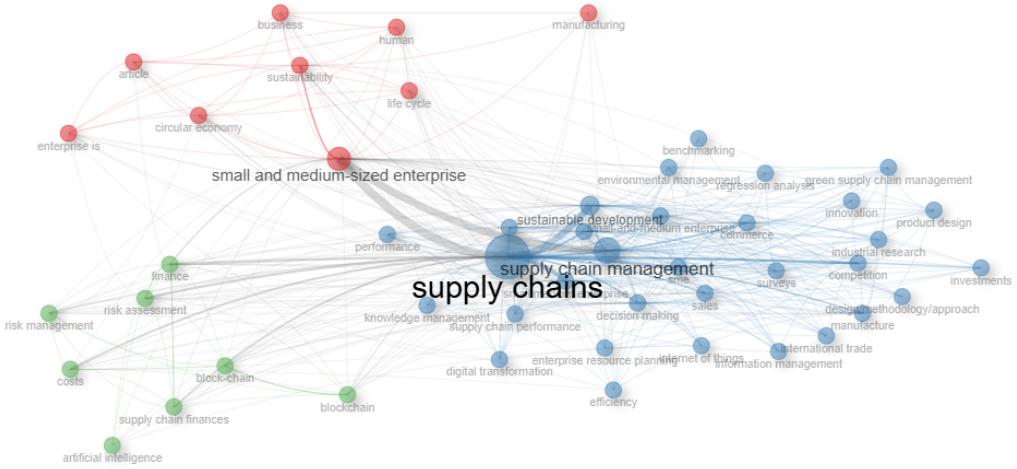

Figure 8 – Co-occurrence Network.

Figure 9 is a Strategic Thematic Map that illustrates the relative position of key themes in publications related to Supply Chain (SC) and Small and Medium Enterprises (SMEs) based on their degree of relevance (centrality) and development (density). Themes such as supply chains, supply chain management, and small and medium-sized enterprise appear in the lower right quadrant as Basic Themes, indicating that they are highly central but not yet extensively developed in a specialized manner. In the upper right quadrant, categorized as Motor Themes, lie sustainable development, commerce, and sustainability, which have both high relevance and high development, reflecting major areas of innovation and focus in the field. Meanwhile, the upper left quadrant includes Niche Themes like SMEs, global market, and ICT, which are well developed but have more limited influence or scope. Lastly, themes such as finance, risk assessment, and costs are found in the lower-left quadrant as Emerging or Declining Themes, suggesting that these topics are either in the early stages of exploration or are losing traction in current research.

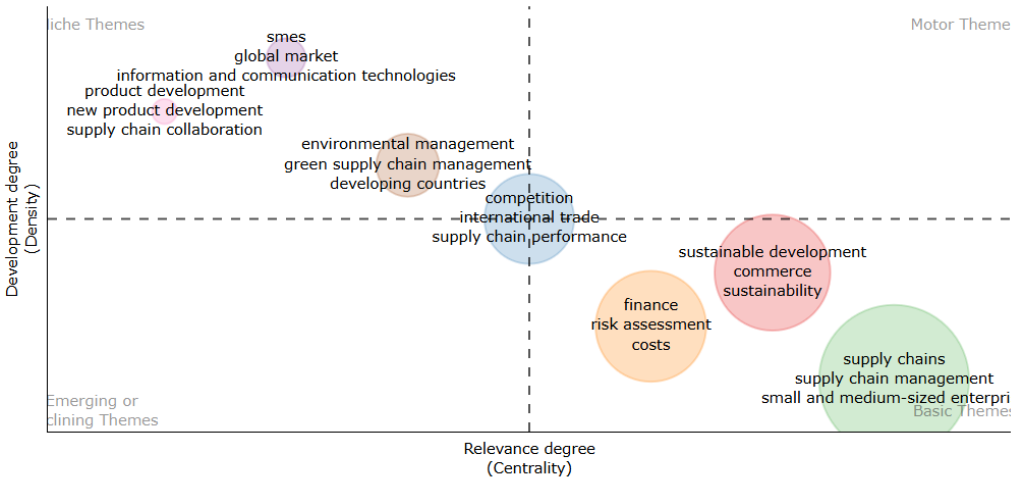

Figure 9 – Thematic Map.

6 CONCLUSION AND FUTURE STUDY

The bibliometric analysis of Scopus-indexed publications on supply chains (SC) within small and medium-sized enterprises (SMEs) employed a theoretical perspective focused on resource-based and network theories to interpret the contributions of these articles. This theoretical framing allowed us to identify significant insights for both practitioners and scholars, highlighting influential research papers characterized by a growing number of publications, extensive international collaboration, broad geographical representation, and notable citation impacts. The global reach of these Scopus-indexed articles, covering six continents, further underscores their relevance and applicability across diverse contexts. Notably, 2023 emerged as the most prolific year, reflecting heightened scholarly interest and the evolving theoretical understanding of SC management in SMEs.

The results of this bibliometric study can be used to evaluate the productivity of SC publications in small and medium-sized enterprises, evaluate the performance of each researcher, and measure the frequency of journal citations, countries, and other performance metrics. Passas (2024) stated that bibliometric analysis greatly influences research evaluation. International collaborations and co-authored papers are often considered in the evaluation process, and this helps improve university rankings. These results will help SC researchers in SME attract new SC research topics and find SC principal researchers and authors in SME. We can say that the analysis of SC publications in SME through bibliometrics will help research evaluation and productivity, gain more attention from the scientific community and local politicians, and can get large funds from local and central governments. In addition, this will help practitioners, students, and early researchers in publishing their research in leading SC journals. In general, this research method can be emulated by other researchers in different fields. In addition, many other bibliometric studies are needed on research articles in the field of SC in SME to keep up with the latest developments.

At last, this work has certain limits. We solely included works from 2015 to 2024; we did not examine works released prior to 2015. We examined the bibliographic data of the papers solely; we did not examine the contents of the publications that is, titles, techniques, or other components. We did not discuss academic institutions or organizations in this journal. For further research, we suggest studying more specific SC publication fields, such as supply chain resilience (SCR) related to SME to deepen the analysis of the bibliometric study and using longer publication year data to support a more comprehensive dataset.

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Author contributions statement

Moh Ramdhan Arif Kaluku: Conceptualization; Formal Analysis; Investigation; Methodology; Resources; Software; Supervision; Validation; Visualization; Writing - Original Draft Preparation; Writing - Review & Editing. Sumiati Sumiati: Conceptualization; Formal Analysis; Methodology; Supervision; Validation; Visualization; Writing - Original Draft Preparation; Writing - Review & Editing. Ainur Rofiq: Conceptualization; Formal Analysis; Methodology; Supervision; Validation; Visualization; Writing - Original Draft Preparation; Writing - Review & Editing. Djumilah Hadiwidjojo: Conceptualization; Formal Analysis; Methodology; Supervision; Validation; Visualization; Writing - Original Draft Preparation; Writing - Review & Editing.

Data Availability

All relevant data is available in the tables of this article.

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