

# MAPPING THE ESG & SUPPLY CHAIN NEXUS: INSIGHTS FROM A BIBLIOMETRIC AND THEMATIC REVIEW

DARREN, P.<sup>1\*</sup> – MARSYALL, P.<sup>1</sup> – PAUL, P.<sup>2</sup> – PETER, Y.<sup>3</sup>

<sup>1</sup> Faculty of Business and Finance, Universiti Tunku Abdul Rahman, Perak, Malaysia.

<sup>2</sup> Faculty of Accountancy, Finance and Business, Tunku Abdul Rahman University of Management and Technology, Kuala Lumpur, Malaysia.

<sup>3</sup> Independent Scholar, Kuala Lumpur, Malaysia.

\*Corresponding author  
e-mail: peteryacob68[at]gmail.com

(Received 18<sup>th</sup> February 2025; revised 19<sup>th</sup> April 2025; accepted 27<sup>th</sup> April 2025)

**Abstract.** The convergence of Environmental, Social, and Governance concerns with supply chain management has attracted considerable interest from academics and professionals. Heightened consciousness of sustainability concerns and mounting demands for firms to embrace ethical practices have spurred extensive research endeavors. This study aims to comprehensively analyze the research area of ESG and supply chain by employing bibliometric analysis. The research was conducted using 1,488 papers from the Scopus database, encompassing the 2014 to November 2024 time frame. The PRISMA protocol guided the comprehensive review of the Scopus database. The study analyzed several aspects, such as the scientific output of papers, highly productive authors, influential publications, leading institutions and countries, keyword co-occurrence, thematic mapping, co-citations, and partnerships between authors and countries. Utilizing VOSviewer as a tool to undertake performance analysis and thematic grouping, the results demonstrate a substantial expansion in ESG and supply chain research throughout the past decade, characterized by a notable rise in published works and citations with thematic grouping encompassing supply chain management, sustainability, sustainable development, environmental impact, green supply chain management, and economic and social affects. This extensive bibliometric study offers valuable insights into ESG and supply chain research growth and changes and establishes a basis for future studies and policy-making efforts. This study seeks to provide researchers and practitioners with valuable information and guidance to develop the subject of ESG and supply chain. It accomplishes this by summarizing the present state of research and recommending potential areas for future research.

**Keywords:** *environmental, social, governance, ESG, supply chain, sustainability*

## Introduction

Understanding the performance of corporations has attracted emphases on using Environmental, Social, and Governance (ESG) indicators by investors and analysts (Alsayegh et al., 2020). ESG encompasses three central factors: that are the environmental, which looks at how the company is performing vis-à-vis the environment, social, which looks at how the company sustains and manages its relationship with employees, suppliers, customers, and communities; and governance, which tries to establish how the company is governed, its standards regarding governing the executives' remunerations, the auditing, the internal controls, and the respecting of the shareholders' rights. Current literature identifies ESG as a dynamic factor to consider when capitalizing, with evidence suggesting that corporations with a better ESG score perform better over the long run. The meta-analysis by Coelho et al. (2023), which comprised more than 2,000 empirical studies, showed that the ESG factors

positively linked to firm-level financial performance. Furthermore, recent studies, which include the survey done by the CFA (Chartered Financial Analyst) Institute in 2022, reveal that ESG factors are becoming more prominent in asset managers' investment practices because of investors' expectations, increased regulatory requirements, and academic research that shows that the ESG dimension influences financial performance. However, criticism and challenges linked to this form of capitalizing also experienced an increase, which can be pointed out as another important fact. The cynical analysis of ESG ratings suggests they can be irrelevant, inapplicable in some cases, and conflicting in others. It has been noted that comparing an organization's total ESG industry rating is difficult. Zumente and Lāce (2021) state that the ESG rating disagreement is derived from the differences in methodologies and weightings adopted by rating agencies, henceforth different ratings for the same firm. Besides, there are concerns with 'greenwashing' whereby firms create an impression of being socially responsible to be attractive to ESG stakeholders (Pizzetti et al., 2021). Studies conducted in 2022, by El-Hage (2021) also underlined the requirement for enhancing the measurement of ESG so that the investments labeled as ESG genuinely represent the sustainable business. However, there is a generally positive trend in the development of strengthening the connection of ESG criteria with business and investment strategies, which indicates the general global trend of intensification of the sustainability of companies.

Since the global economy appears to have shifted attention to supply chain management (SCM), the latest research points towards attaining efficiency, reducing cost, and improving the satisfaction level of the end customer (Hazen et al., 2021; Wieland, 2021; Vidrova, 2020). SCM combines all the processes from acquiring raw materials to the final delivery of the end products to customers. SCM literature presented in the last few years stresses incorporating technology in the supply chain to enhance visibility, flexibility, and responsiveness. For example, Mohsen (2023) described how aspects of digital transformation, including blockchain, AI, and IoT, possess the potential to change SCM by applying real-time tracking of goods, demand forecasting using analytics and smart decision-making. These technologies enable the organization to manage disruptions and inventory in a better and improved manner, as well as improve communication with other members of the supply chain, making the supply chain system more efficient. For instance, it has been deemed that managing SCM in the contemporary global environment is not easy (Ghadimi et al., 2019). The COVID-19 pandemic also brought to realize strengths and weaknesses in supply chains, where one of these weaknesses was otherwise dependency on single-source suppliers and otherwise limited flexibility in logistics. A recent study by Tarigan et al. (2021) also underlined the necessity for companies to strengthen their supply chains by expanding the suppliers' base, investing in new digital structures, and maintaining high levels of flexibility. The study also stressed that sustainability has shifted into the focus of SCM as customers and governmental bodies pay much attention to the environmental and social implications of the activities of enterprises. This also comprises attempts to control carbon emissions, exercising responsible sourcing, and encouraging circular economy systems. Further, supply chain visibility has been reported as being used for tracking and ensuring that the companies implement sustainability criteria since the set tools aid in measuring possible risks and strengths. Thus, by overcoming these challenges and utilizing technological opportunities, companies can design and build more effective, resistant, but simultaneously environmentally and socially responsible supply chains (Zavala-Alcívar et al., 2020).

ESG aspect implementation in SCM is becoming significant since it helps organizations meet the rules and regulations, the demands of the consumers, and the organization's sustainability strategy (Nugroho et al., 2024). SCM and ESG factors are geared towards establishing less harm to the environment, social responsibilities, and the highest corporate governance standards in every tier of the supply chain. Sardanelli et al. (2022) emphasize that factors considered include how companies incorporate ESG factors in supply chains to benefit from better risk management and improved operations. For example, implementing the sustainable sourcing strategy not only helps to decrease organizations' impact on the environment but also to manage the risks related to the scarcity of resources and the need for compliance with the legislation. Likewise, the applications of fair labor conditions and ethical sourcing are other social responsibilities that can create brand awareness and loyalty among consumers. The management echelon adds structure to corporate governance to enhance compliance and accountability practices, which positively impacts stakeholders' confidence within global standards, enhancing the agility of the organization's supply chains. Nevertheless, ESG integration into companies' supply chains faces several essential issues that hardly remain unsolved without strategic management and technology adoption (Qian et al., 2023). Chit and Vasudevan (2024) stated the significant challenges and declared that compliance with ESG standards in the global and multi-tiered supply chains is challenging. Most firms face significant challenges exercising oversight over the supply chain beyond the first tier, which is detrimental to enforcing ESG compliance. Companies are now using advanced solutions such as blockchain and artificial intelligence to overcome such challenges to improve SCM. For instance, blockchain technology in the supply chain allows for the integrity of products or services to be tracked from production to delivery while observing the ESG principles (Vezér et al., 2022). A circular economy can, therefore, be achieved through the inputs identified through AI for risk and opportunity assessment by the supply chain, with ESG-related problems addressed on time. The study also recommends that the management of the organizations develop partnerships and collaborations with suppliers and other stakeholders because this fosters values and sustains efforts of ESG integration. The strategic use of technology and efficient cooperation with other enterprises can solve problems associated with establishing ESG management and create effective supply chains that are simultaneously effective, sustainable, and socially oriented (Olanrewaju et al., 2024).

Thus, this study explores the trends and developments to help researchers better understand a global ESG and SCM research viewpoint. This implies that a review is necessary to help determine the author's future or perhaps current contribution. In the same fashion, this study operates as an architecture that can afford a systematic approach to evaluate the efficacy and pertinence of ESG and supply chain literature in the present moment and allow practitioners and researchers to learn about the most recent trends in ESG and SCM studies. Thus, the current study aims to address the following research questions (RQs):

RQ1: What is the current trend of research on ESG and supply chain?

RO2: What types of research documents are on ESG and supply chain?

RQ3: Which nations make substantial contributions to ESG and supply chain?

RQ4: What are the highly cited documents on ESG and supply chain?

RQ5: Which journal/sources of publications have the most impact on ESG and supply chain?

RQ6: Which authors have produced the most ESG and supply chain publications?

RQ7: Which institutions have substantially contributed to ESG and the supply chain?

RQ8: What are the most common terms used in a scientific ESG and supply chain study?

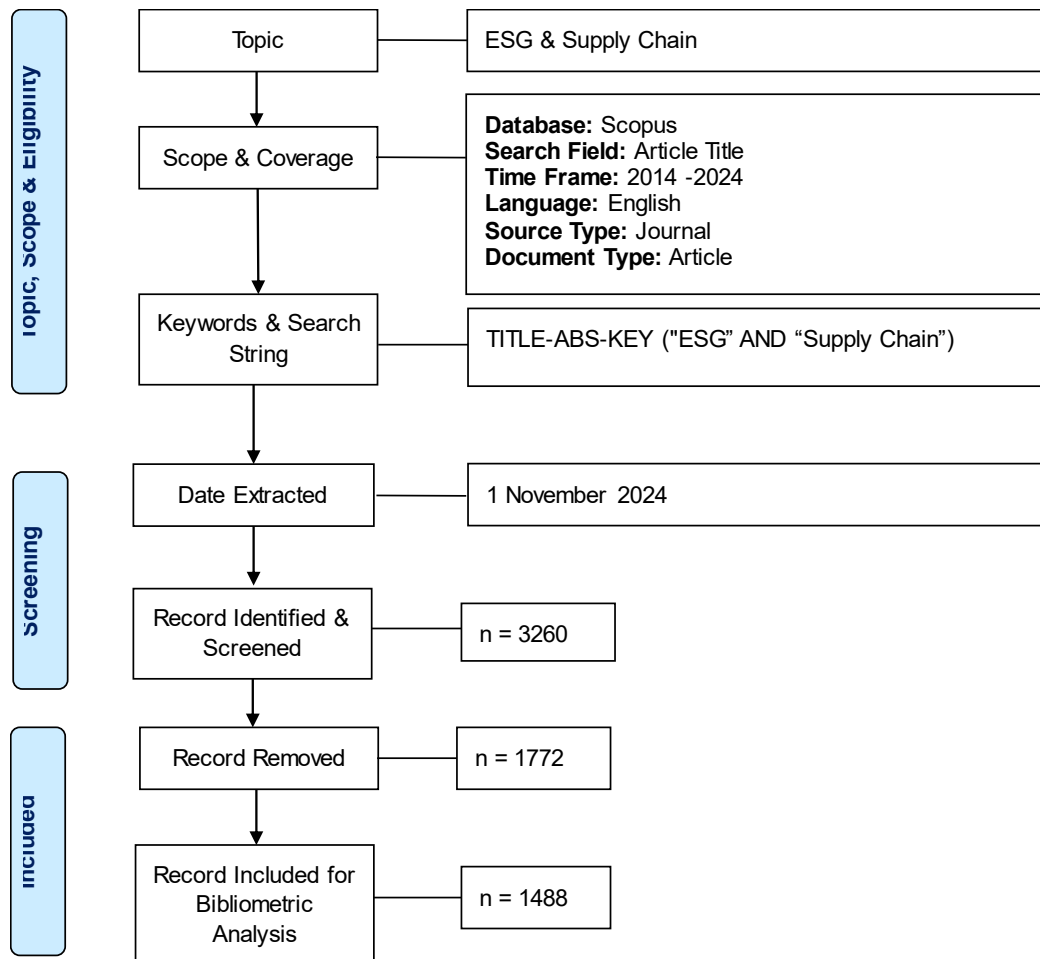
Before pursuing the study, the primary search query employing TITLE-ABS-KEY ("ESG" AND "Supply Chain") was performed in the Scopus database to obtain insights about the scope of bibliometric analysis in this field.

## Materials and Methods

This study's method revolves around how the data were obtained and sorted out until the final data set remains ready for analysis. The Scopus database was chosen as it is the largest and most comprehensive abstract and indexing database ever and the most extensive collection of the world's scientific journals available for full-text research via citation and abstract searching (Burnham, 2006). Furthermore, Falagas et al. (2008) as well as Nwagwu (2007) point out that Scopus is the most extensive searchable index of citation and abstract database. The documents included in this study were chosen during the research process, as described in the PRISMA flow diagram (*Figure 1*). PRISMA stands for Preferred Reporting Items for Systematic Reviews and Meta-Analyses, a tool predominantly used in systematic reviews and meta-analyses focusing on healthcare. It offers a clear, logical reporting framework so research is always clear and easy to reproduce. The PRISMA guidelines also recommend that the authors create an extensive protocol that contains specific goals, the approach to the search, the requirements for the inclusion or exclusion of sources, and the process of collecting data. A search query using the TITLE-ABS-KEY ("ESG" AND "Supply Chain") was entered to retrieve pertinent papers from the Scopus database on 01 November 2024. *Table 1* shows the criteria used to determine whether this article should be included or excluded. Data analysis and cleansing were also performed with the help of bibliographic and BiblioMagika @ split tools. The information gathered from biblioMagika@Split, and VOSviewer was merged, then the bibliometric network and emergent trends were analyzed. biblioMagika® is suggested to be an analytical instrument built into Excel for carrying out bibliometric calculations, emphasizing the evaluation of productivity in publishing and the analysis of scholarly output. BiblioMagika® also helps researchers process and prepare this data for subsequent use in VOSviewer and Biblioshiny (Ahmi, 2021).

**Table 1.** Inclusion and exclusion criteria.

| Criteria  | Value                                                                                                                                                                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inclusion | Keywords search was based on all fields<br>Documents written in English language<br>Documents published between 2014 -November 2024<br>Document types only limited to article, book chapter, conference paper, review, book, conference review, editorial |
| Exclusion | Date of publication before 2014<br>Documents published in non-English languages                                                                                                                                                                           |



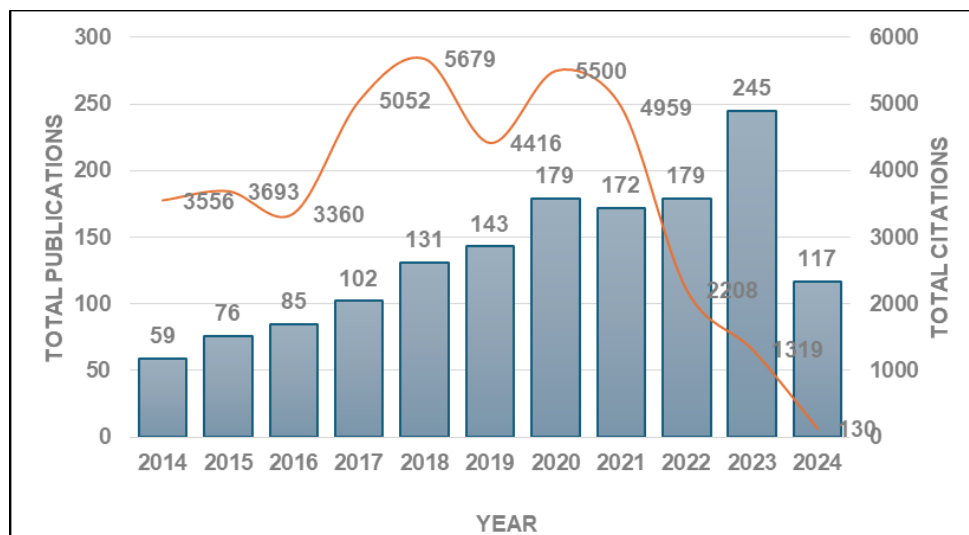
**Figure 1.** Flow diagram of the search strategy.

## Results and Discussion

### *Trends in publication*

Figure 2 displays the patterns of academic publications and citation frequency concerning ESG factors in the supply chain for 2014-2024. The blue bars refer to the total number of such publications in the year, and the orange line to the total number of citations that the publications gained within the year, demonstrating the worth and interest of the academic society in the researched material. The graph reveals a steady increase in publications from 2014, starting with 59 publications, to a peak in 2020 with 179 publications. This trend shows a rising interest in scholarly and practical research on applying ESG factors into supply chains, possible through awareness of sustainable issues worldwide, the influences of laws and rules, and the value of sustainable management. When it relates to the peak in 2020, it could be attributed to an increased global focus on sustainability thanks to the implementation of the United Nations Sustainable Development Goals and the UN Climate Change Conference (COP21) in Paris that held on 2015, which has possibly encouraged research on how supply chains can help realize these sustainability goals. The citation trend depicted by the orange line shows an initial lag compared to publications but eventually surpasses the volume of publications, peaking in 2021 with 5,679 citations. This indicates that while publications

peaked earlier, their impact, as measured by citations, continued to grow, highlighting the seminal nature of the work produced during this period. The decline in both publications and citations post-2021 suggests a maturation of the field where foundational issues have been extensively explored, and the focus may be shifting towards more specific or advanced topics within the ESG-supply chain nexus. This phase could involve a deeper investigation into the efficacy of ESG initiatives, technology integration in sustainable supply chains, or sector-specific challenges.



**Figure 2.** Trend in the publication of ESG and supply chain.

### Document type

The research documents in *Table 2* demonstrate the diverse and strong methods of sharing information in ESG and Supply Chain. With 1,073 entries, articles constitute the primary mode of knowledge dissemination in ESG and supply chain, representing the highest proportion of documents at 72.11%. This prevalence is seen frequently in academic research, where articles are usually peer-reviewed and are deemed reliable sources of the findings of new, original studies and new theoretical developments. The subject's fast-paced growth and the intensive research and scholarly debate visible in that source type explain the prevalence of the article type. This high percentage proves a relatively high volume of research and the shared commitment of the academic community to contributing to the further accumulation of knowledge and addressing such issues in the context of ESG and supply chain. Conference papers are the second most common document type, comprising 10.42% of the publications. This indicates a significant level of engagement within the academic community, as conferences serve as essential platforms for exchanging ideas, preliminary findings, and networking among researchers. Book chapters, which make up 6.52%, and reviews, at 6.32%, suggest an effort to consolidate existing knowledge and provide comprehensive overviews of the current state of research, respectively. Such publications are important for the systematization of the available literature and the definition of the research gaps. Books and conference reviews make up a smaller percentage. Still, they probably indicate a more focused but active source of extensive discussions and critiques of the existing methodologies and theories. Editorials, the least at 0.27%, typically provide commentary on the direction of the field and emerging trends, reflecting the thought

leadership within the academic community on ESG in supply chains. In a nutshell, diversifying document types proves an extensive and varied academic reality. Articles introduce new findings, while conference activities and books support developing discussions and refining knowledge within the community. This variety sustains a multifaceted academic environment where research is vigorous, theories are developed and pushed forward, and these enhancements are disseminated within ESG and supply chain. All these should form core input to any bibliometric analysis for a research discipline as it targets a top journal, which, in addition to showing the magnitude and direction of the research activities, helps in charting out the intellectual topology and dynamics of the subject area.

**Table 2.** *Types of retrieved documents.*

| Document type     | Total number of publications | Percentage (%) |
|-------------------|------------------------------|----------------|
| Article           | 1073                         | 72.11%         |
| Conference Paper  | 155                          | 10.42%         |
| Book Chapter      | 97                           | 6.52%          |
| Review            | 94                           | 6.32%          |
| Book              | 38                           | 2.55%          |
| Conference Review | 27                           | 1.81%          |
| Editorial         | 4                            | 0.27%          |

### **Publication by country**

Table 3 further details the classification of the identified research publications concerning ESG within the supply chain regarding country affiliations between 2014 and 2024. Indonesia leads in total publications (TP) with 51, indicating a robust interest and active research community in ESG-related supply chain issues within the region. However, when considering the impact metrics such as C/P and C/CP, Indonesia presents lower averages than some Western countries, suggesting that while the volume of research is high, its influence or recognition as measured by citations is relatively moderate. Contrastingly, the United States, with fewer publications at 24, shows a significantly higher impact with a C/P of 13.17 and a C/CP of 16.63. These figures highlight that research from the United States, though less frequent, is extensively cited, implying high-quality contributions that resonate well within the global academic community. Further examining the influence metrics, the United Kingdom and South Korea showcase remarkable figures in citations per publication, with averages exceeding 27 and 43, respectively. High values suggest that certain publications from these countries have had a greater impact by providing some vital information or research novelty to the ESG and supply chain discussion. This points at issues of quality and novelty in research within these regions. The fact that the United Kingdom has a high h-index and g-index supports this statement, as it shows that a significant number of the country's research findings are productive and significant ones. On the other extreme, some nations, including New Zealand and Czechia, cited zero times in the context of ESG-related supply chain, and it could either relate to the fact that the field is still in its infancy, or these countries are hardly involved with the international research community. The variation of publication and citation rates across countries suggested different strategic objectives, accessibility of research funding, scholarly cooperation, and the existence of concentrated research institutes in sustainability and ESG practices in supply chains. Besides, it assists in understanding the leading countries involved in

this type of research and reveals possibilities of future studies and partnerships based on the existing gaps.

**Table 3. Publication by countries.**

| Country            | TP | NCP | TC  | C/P   | C/CP  | <i>h</i> | <i>g</i> | <i>m</i> |
|--------------------|----|-----|-----|-------|-------|----------|----------|----------|
| Indonesia          | 51 | 25  | 145 | 2.84  | 5.80  | 7        | 12       | 0.438    |
| United States      | 24 | 19  | 316 | 13.17 | 16.63 | 9        | 17       | 0.180    |
| Jordan             | 16 | 9   | 102 | 6.38  | 11.33 | 5        | 10       | 0.833    |
| China              | 11 | 8   | 20  | 1.82  | 2.50  | 2        | 4        | 0.133    |
| Malaysia           | 11 | 9   | 90  | 8.18  | 10.00 | 5        | 9        | 0.385    |
| Australia          | 10 | 10  | 99  | 9.90  | 9.90  | 5        | 9        | 0.135    |
| United Kingdom     | 9  | 9   | 249 | 27.67 | 27.67 | 8        | 9        | 0.229    |
| Turkey             | 7  | 3   | 14  | 2.00  | 4.67  | 2        | 3        | 0.143    |
| Italy              | 6  | 5   | 20  | 3.33  | 4.00  | 3        | 4        | 0.200    |
| Saudi Arabia       | 5  | 5   | 32  | 6.40  | 6.40  | 4        | 5        | 1.000    |
| Romania            | 5  | 3   | 13  | 2.60  | 4.33  | 2        | 3        | 0.143    |
| South Korea        | 4  | 4   | 174 | 43.50 | 43.50 | 3        | 4        | 0.094    |
| New Zealand        | 4  | 0   | 0   | 0.00  | 0.00  | 0        | 0        | 0.000    |
| Latvia             | 3  | 2   | 26  | 8.67  | 13.00 | 2        | 3        | 0.222    |
| Bangladesh         | 3  | 3   | 13  | 4.33  | 4.33  | 3        | 3        | 0.375    |
| Portugal           | 2  | 2   | 29  | 14.50 | 14.50 | 2        | 2        | 0.222    |
| Taiwan             | 2  | 2   | 4   | 2.00  | 2.00  | 2        | 2        | 0.222    |
| Russian Federation | 2  | 2   | 3   | 1.50  | 1.50  | 1        | 1        | 0.143    |
| Bahrain            | 2  | 1   | 11  | 5.50  | 11.00 | 1        | 2        | 0.250    |
| Pakistan           | 2  | 2   | 13  | 6.50  | 6.50  | 2        | 2        | 0.400    |
| Spain              | 2  | 2   | 13  | 6.50  | 6.50  | 2        | 2        | 0.111    |
| Belgium            | 1  | 1   | 1   | 1.00  | 1.00  | 1        | 1        | 0.111    |
| Ireland            | 1  | 1   | 2   | 2.00  | 2.00  | 1        | 1        | 0.125    |
| Czechia            | 1  | 0   | 0   | 0.00  | 0.00  | 0        | 0        | 0.000    |
| Finland            | 1  | 1   | 3   | 3.00  | 3.00  | 1        | 1        | 0.100    |

*Note: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; g=g-index, m=m-index.*

### Top cited documents

Table 4 displays the literature list containing documents on ESG criteria and supply chain with a high citation rate. Proceeding from the most cited work Kouhizadeh et al. (2021), the authors outline the applications of blockchain technologies in sustainable supply chain and reveal the challenges, specifying blockchain potential in delivering change. This paper stands out not only for its high citation count of 650 but also for its impressive citations per year at 162.50, indicating the cutting-edge relevance and rapid recognition within the academic community. A lot of attention to such issues indicates its applicability in the contemporary technological and sustainability trends, especially in implementing the digital era's developments, such as blockchain technologies to optimize ESG-focused supply chains. Following that, Nascimento et al. (2019) explore Industry 4.0 technologies to enable circular economy practices within manufacturing contexts. With 572 total citations and a C/Y of 95.33, this document highlights the critical intersection of technological advancement and sustainability. It lays down new strategy patterns that build on Industry 4.0 to enhance the state of the environment and operations. Such papers are critical as they point to ways of adopting new technologies in conventional production and SCM to enhance sustainability. Dangelico and Vocalelli (2017) paper delve into "Green Marketing," synthesizing literature to define strategies and tools, garnering 402 citations and a C/Y of 50.25. This is a sign that marketing is gradually becoming effective in advocating for sustainability from supply chains to customers' discretion. In the same way, Farahani et al. (2014) present a review of competitive supply chain that considers ESG factors, accumulating 351 citations, underscoring network design's foundational role in achieving competitive yet

sustainable supply chain operations. Altogether, these documents demonstrate a rapidly changing and expanding field in which the incorporation of ESG criteria into the supply chain is not only necessary but also depends more on technology-sustainable solutions of tomorrow, such as blockchain and Industry 4.0. The citations and their annual averages attest to the sustained attention and persisting potency, which shows that these issues remain highly important in modern discourses on sustainability within business. Any research of this nature serves as a foundation for strategizing to address today's sustainability issues in the global supply system.

**Table 4.** Top 10 highly cited documents.

| Author(s)                       | Title                                                                                                                                         | Source title                                                            | TC  | C/Y    |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----|--------|
| Kouhizadeh et al. (2021)        | Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers                                             | International Journal of Production Economics                           | 650 | 162.50 |
| Nascimento et al. (2019)        | Exploring Industry 4.0 technologies to enable circular economy practices in a manufacturing context: A business model proposal                | Journal of Manufacturing Technology Management                          | 572 | 95.33  |
| Dangelico and Vocellelli (2017) | "Green Marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature                        | Journal of Cleaner Production                                           | 402 | 50.25  |
| Farahani et al. (2014)          | Competitive supply chain network design: An overview of classifications, models, solution techniques and applications                         | Omega (United Kingdom)                                                  | 351 | 31.91  |
| Mitra and Datta (2014)          | Adoption of green supply chain management practices and their impact on performance: An exploratory study of Indian manufacturing firms       | International Journal of Production Research                            | 337 | 30.64  |
| Meixell and Luoma (2015)        | Stakeholder pressure in sustainable supply chain management: A systematic review                                                              | International Journal of Physical Distribution and Logistics Management | 279 | 27.90  |
| Benzidia et al. (2021)          | The impact of big data analytics and artificial intelligence on green supply chain process integration and hospital environmental performance | Technological Forecasting and Social Change                             | 272 | 68.00  |
| Sreedevi and Saranga (2017)     | Uncertainty and supply chain risk: The moderating role of supply chain flexibility in risk mitigation                                         | International Journal of Production Economics                           | 272 | 34.00  |
| Bag et al. (2018)               | Industry 4.0 and supply chain sustainability: framework and future research directions                                                        | Benchmarking                                                            | 256 | 36.57  |
| Govindan et al. (2014)          | Impact of supply chain management practices on sustainability                                                                                 | Journal of Cleaner Production                                           | 253 | 23.00  |

*Note: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; g=g-index, m=m-index.*

### Top publishing journal/sources

Table 5 outlines the details of the most productive journals in the field of ESG and supply chain. At the forefront is the Journal of Cleaner Production, with a total of 49 publications and an impressive citation count of 10,380, averaging 211.84 citations per publication and 69.66 per cited paper. This journal's high h-index and g-index of 49 reflect its pivotal role in disseminating high-impact research focused on sustainable production and ESG practices. The significant number of citations indicates the journal's content resonates strongly with the ongoing academic and practical discussions around sustainable practices in supply chains, underlining its status as a leading publication in the sustainability domain. The International Journal of Production Economics stands out with 14 publications but an exceptionally high C/P ratio of 261.14, underscoring the profound impact of its articles, which garnered an average of 85.02 citations per cited paper. This journal typically explores the economic aspects of

production and supply chain systems, including cost-benefit analyses, economic modeling, and the integration of ESG factors into economic evaluations. Such a focus attracts substantial citations, indicating the relevance and applicability of the research to contemporary challenges in integrating economic efficiency with environmental and social governance. Sustainability (Switzerland) shows a unique pattern with ten publications but a very high C/P of 315.40, the highest in the table, albeit with a relatively low C/CP of 23.19. This indicates that while every publication garner significant attention, the citations are spread across many citing papers, which may suggest a broad but shallow influence on the field. This journal covers a wide range of topics under sustainability, reflecting its interdisciplinary approach to addressing ESG issues across different sectors and industries. Lastly, journals like Transportation Research Part D: Transport and Environment and Technological Forecasting and Social Change exhibit strong individual impacts with their focused thematic scope on transport-related environmental issues and the role of technology in shaping future societal changes, respectively. The high citations per publication and cited paper in these journals highlight the targeted but critical research they publish. They contribute specifically to discussions on how transportation and technological advancements can align with ESG goals to create sustainable and efficient supply chain systems. Even with fewer publications, these journals exemplify the role of specialized subfields as components of extensive ESG and supply chain discussions.

**Table 5. Most productive source title.**

| No  | Source Title                                                            | TP | NCA | NCP | TC    | C/P    | C/CP  | h  | g  |
|-----|-------------------------------------------------------------------------|----|-----|-----|-------|--------|-------|----|----|
| 1.  | Journal of Cleaner Production                                           | 49 | 581 | 149 | 10380 | 211.84 | 69.66 | 49 | 49 |
| 2.  | International Journal of Production Economics                           | 14 | 151 | 43  | 3656  | 261.14 | 85.02 | 14 | 14 |
| 3.  | Sustainability (Switzerland)                                            | 10 | 500 | 136 | 3154  | 315.40 | 23.19 | 10 | 10 |
| 4.  | Transportation Research Part D: Transport and Environment               | 6  | 39  | 14  | 1307  | 217.83 | 93.36 | 6  | 6  |
| 5.  | International Journal of Physical Distribution and Logistics Management | 5  | 49  | 16  | 1098  | 219.60 | 68.63 | 5  | 5  |
| 6.  | Transportation Research Part E: Logistics and Transportation Review     | 4  | 76  | 18  | 977   | 244.25 | 54.28 | 4  | 4  |
| 7.  | International Journal of Production Research                            | 4  | 117 | 30  | 1731  | 432.75 | 57.70 | 4  | 4  |
| 8.  | Technological Forecasting and Social Change                             | 4  | 38  | 10  | 953   | 238.25 | 95.30 | 4  | 4  |
| 9.  | Supply Chain Management                                                 | 2  | 52  | 16  | 651   | 325.50 | 40.69 | 2  | 2  |
| 10. | TQM Journal                                                             | 2  | 16  | 5   | 388   | 194.00 | 77.60 | 2  | 2  |

### Top authors

Table 6, offered in this article, contains the list of scholars who are currently most productive and active in the field of ESG factors in supply chain. Regarding the total publications, Sara F. Rushinek and Avi Rushinek, both from the University of Miami, are at the top with five publications each. Despite their productivity, the citation impact of their work is relatively low, with a total of only two citations for their publications, which translates to a C/P of 0.4 and a C/CP of 1. This would imply that while they might have published a lot in terms of quantity, their research could be in relatively newer areas of ESG in supply chains or could be based on limiting topics that have not yet gained much acceptance in academia. On the other hand, Choe Jong-Min's three papers in three different journals indicate a great level of impact, with a Citation of 171. This high citation rate, with a C/P of 57 and a C/CP of 57, indicates that Choe's work is not only frequently cited but also foundational, likely introducing new theories,

frameworks, or significant empirical findings that are highly relevant to the field of ESG and supply chain. In contrast, Gordon, Lawrence A., from the University of Kansas, has two publications with a remarkably high citation count of 284, the highest in the dataset, which gives him a C/P of 142 and a C/CP of 142. These citation indices indicate that Gordon's papers have set a tone in the literature and thus can be said to have a substantial impact on this line of research. This could be a sign that they picked up innovative work that probably incorporates new methods/techniques or exhaustive overviews frequently adopted and referred to within scholarly communities dedicated to ESG and SCM. In summary, the data shows a diverse picture of publication and citation profile that indicates considerable contributions to the advancement of knowledge in ESG and supply chain from numerous published works and papers. However, a variation in productivity and impact appears to be influenced by paper frequency. These top authors do not only contribute to the academic discourse but also to the actual applications and future developments and strategies of ESG in global supply chains.

**Table 6. Top 10 authors.**

| No  | Full Name           | Current Affiliation                | Country       | TP | NCP | TC  | C/P | C/CP | h | g |
|-----|---------------------|------------------------------------|---------------|----|-----|-----|-----|------|---|---|
| 1.  | Rushinek, Sara F.   | University of Miami                | United States | 5  | 2   | 2   | 0.4 | 1    | 1 | 1 |
| 2.  | Rushinek, Avi       | University of Miami                | United States | 5  | 2   | 2   | 0.4 | 1    | 1 | 1 |
| 3.  | Choe, Jong-Min      | Kyungpook National University      | South Korea   | 3  | 3   | 171 | 57  | 57   | 3 | 3 |
| 4.  | Gordon, Lawrence A. | University of Kansas               | United States | 2  | 2   | 284 | 142 | 142  | 2 | 2 |
| 5.  | Chen, Guangying     | Henan Coal Chemical Industry Group | China         | 2  | 2   | 3   | 1.5 | 1.5  | 1 | 1 |
| 6.  | He, Quanxiu         | Henan Polytechnic University       | China         | 2  | 2   | 3   | 1.5 | 1.5  | 1 | 1 |
| 7.  | Hunton, James E.    | Bentley University                 | United States | 2  | 2   | 38  | 19  | 19   | 2 | 2 |
| 8.  | Rasch, Ronald H.    | Auburn University                  | United States | 1  | 1   | 2   | 2   | 2    | 1 | 1 |
| 9.  | Liu, Xue Jing       | Bohai University                   | China         | 1  | 0   | 0   | 0   | 0    | 0 | 0 |
| 10. | Wu, Anne            | National Chengchi University       | Taiwan        | 1  | 1   | 49  | 49  | 49   | 1 | 1 |

### **Most influential institutions**

Table 7 outlines a valuable summary of institutions supporting ESG and supply chain research. Jadara University from Jordan is on the list of the top twenty universities with eight total publications and citation impact, evidenced by 82 total citations, a C/P of 10.25, and a C/CP of 16.40. This is a very high citation per publication, which shows that Jadara University is productive in research, and the output is highly cited and significant in Various fields of academic studies addressing profound areas of ESG in supply chains, which is in line with current global research interests and developments. The availability of h-index and g-index further supports its academic activity's standing and cognition, meaning that this institution contributes to the core knowledge and is often cited by other sources. In contrast, institutions like Universitas Padjadjaran and Bina Nusantara University in Indonesia show a lower impact with fewer total citations and a lower C/P and C/CP ratio. For instance, Universitas Padjadjaran has five publications, but only one cited publication and two citations, yielding a C/P of 0.40 and a C/CP of 2.00. This implies that although these institutions are actively conducting research within the ESG and supply chain-related fields, their research is not well received or cited in the academic circle. This could be because their field of

specialization is relatively young and, therefore, has not attracted much attention yet, or their work is based on a certain geographical area that has not been well explored at the international level. On the other hand, Universiti Malaysia Terengganu demonstrates remarkable citation efficiency with three publications, all of which are cited, accumulating 64 citations. This results in a high C/P and C/CP of 21.33, indicating that their research is highly impactful, possibly introducing innovative methodologies or new insights into sustainable practices within supply chains that are critical to the field. The number of citations that have been so far generated in three papers produced by this institution is still enormous. It shows the level of research quality that this institution is offering as being superior and of significant impact in the scientific fraternity given the very low h index and g index after only three papers have been published.

**Table 7.** *Top 10 institutions.*

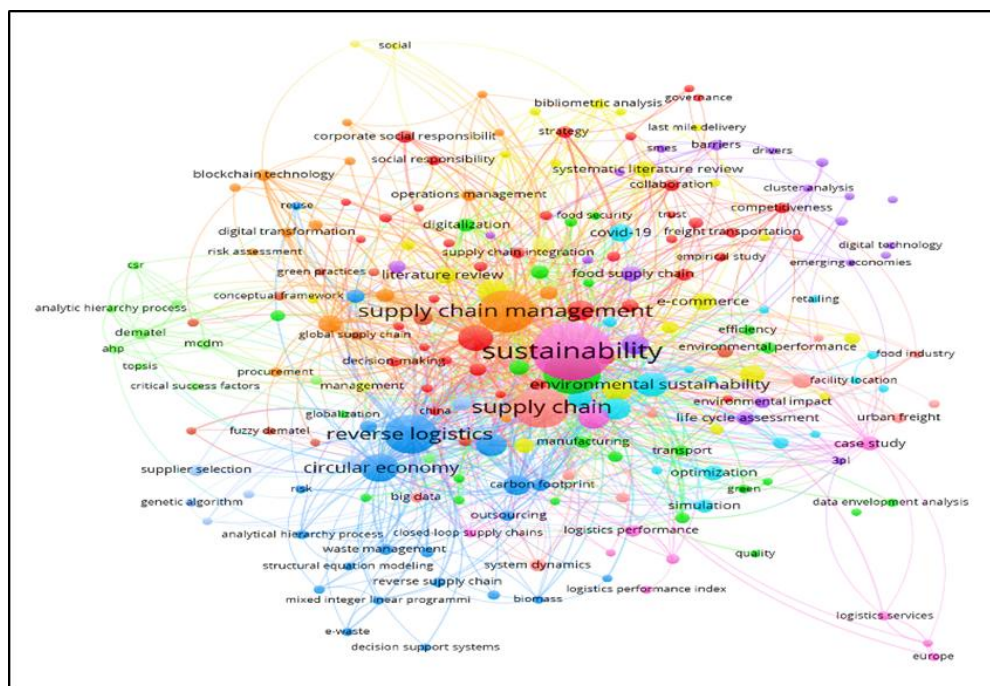
| No  | Institution Name                        | Country   | TP | NCP | TC | C/P   | C/CP  | h | g |
|-----|-----------------------------------------|-----------|----|-----|----|-------|-------|---|---|
| 1.  | Jadara University                       | Jordan    | 8  | 5   | 82 | 10.25 | 16.40 | 4 | 8 |
| 2.  | Universitas Padjadjaran                 | Indonesia | 5  | 1   | 2  | 0.40  | 2.00  | 1 | 1 |
| 3.  | Bina Nusantara University               | Indonesia | 4  | 0   | 0  | 0.00  | 0.00  | 0 | 0 |
| 4.  | Universiti Kebangsaan Malaysia          | Malaysia  | 3  | 3   | 15 | 5.00  | 5.00  | 2 | 3 |
| 5.  | University of Antwerp                   | Belgium   | 3  | 3   | 5  | 1.67  | 1.67  | 1 | 2 |
| 6.  | Universiti Malaysia Terengganu          | Malaysia  | 3  | 3   | 64 | 21.33 | 21.33 | 3 | 3 |
| 7.  | Macquarie University                    | Australia | 2  | 2   | 3  | 1.50  | 1.50  | 1 | 1 |
| 8.  | Amman Arab University                   | Jordan    | 2  | 1   | 9  | 4.50  | 9.00  | 1 | 2 |
| 9.  | Universitas Sumatera Utara              | Indonesia | 2  | 1   | 3  | 1.50  | 3.00  | 1 | 1 |
| 10. | University of Muhammadiyah<br>Tangerang | Indonesia | 2  | 0   | 0  | 0.00  | 0.00  | 0 | 0 |

These variations among institutions reveal the characteristics of the global academic community regarding research productivity and its impact on ESG and the supply chain. It reveals the overall level of research development at the studied institutions and their spheres of interest, which is crucial for understanding where the most important and innovative works are currently being conducted and outlines the institutions that can be considered as the leaders in the given sphere as well as new potential authors, whose works can be interesting for further investigation. The given account is essential to comprehend the current condition of international research initiatives and cooperation in the context of the rapidly growing and changing field of ESG in the supply chain.

### **Keyword analysis**

The network diagram that is shown in *Figure 3* presents the author's keywords in the sphere of ESG in supply chain management as a dense web of interconnected terms. The circles of keywords distinguish different topics, which are painted in different colors and demonstrate the connections between the aspect's researchers pay attention to in this sphere. These clusters do let us not only identify the focal areas of the current research being done but also evaluate dynamics and development of the topics over time and the field's response to the new trends and global challenges. The cluster that supplies the concept in the center of the visual represents the keywords related to the area of study, such as supply chain, SCM, and sustainability. This, characterized by greater node sizes and connection density, identifies the cluster as placing an active focus on the incorporation of sustainability into the mechanisms of the supply chain. This cluster reveals that academic interest in this area is still committed to investigating the measures to improve supply chain resilience and decrease its negative effects on the environment through the so-called environmental sustainability and reverse logistics. Besides this core, there is the visualization of the cluster that includes technological

aspects like “blockchain technology,” “digital transformation,” and “Industry 4.0.” This means a great tendency to use advanced technologies to solve the problems of transparency, efficiency, and compliance in a sustainable supply chain. Presumably, research in this area studies how, for instance, blockchain can offer indisputable and non-alterable information to improve the effectiveness of the environmental rules and ESG criteria and encourage the actors to share reports on their outcomes. Another unique group represents the phrases ‘social responsibility,’ primarily ‘corporate social responsibility’ (CSR), pointing to social aspects of supply chain management. It shows today’s awareness of the social dimension of sustainability, like labour relations, community effects, and stakeholders. Stakeholder research related to these keywords investigates how CSR management strategies apply best practices and regulatory standards while aiming to impact society, thus increasing their social acceptance positively.



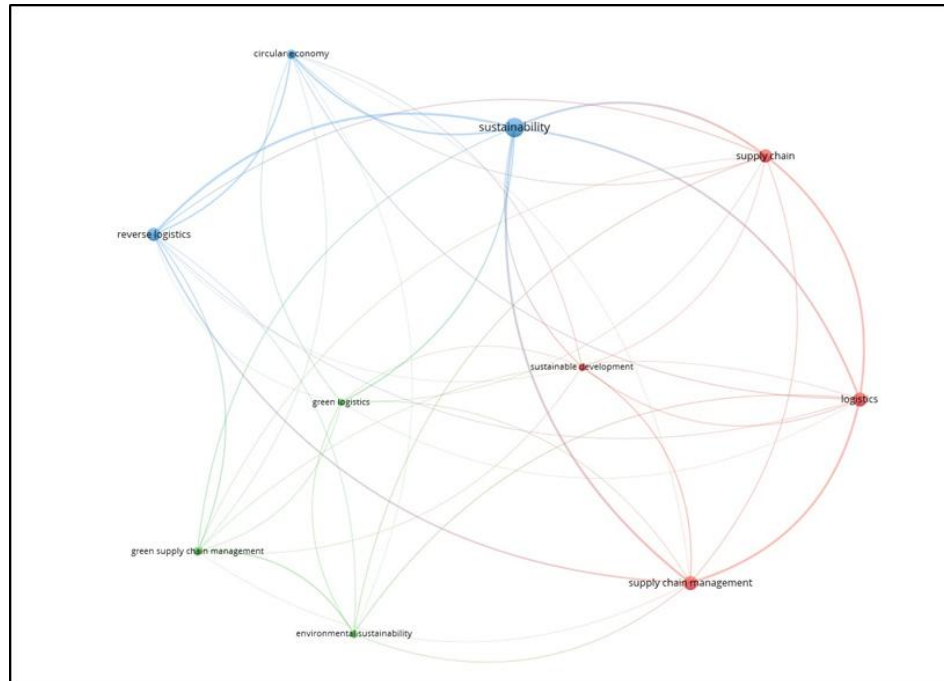
**Figure 3.** Network visualization map of the author keywords.

Finally, the grey area includes keywords such as ‘circular economy,’ ‘carbon footprint,’ and ‘e-waste,’ indicating the highly specialized studies of the appropriate supply chain initiatives to minimize waste and emissions. These areas are emerging more for the global supply chain to mitigate the effects of their products on the environment while developing circular economy systems. Altogether, the visualization provided by VOSViewer provides a valuable bird’s eye view of the current state of research in the field, as well as the scope and depth of investigation being conducted on ESG within SCM.

### ***Prevalent themes of ESG and supply chain research***

By expanding on co-citation and bibliographic coupling groundwork, we use co-occurrence analysis to investigate these trends in the ESG and supply chain research domain. *Figure 4* depicts the utilization of authors' keywords for conducting a co-

occurrence analysis. The keywords are subjected to a sequential filter to examine the development of ESG and supply chain studies covered in a minimum of five research papers in our review. In co-occurrence analysis, VOSviewer groups keywords according to similar themes (shown in different cluster colors) and comprehensively understands the field's current landscape and future potential. The results are grouped into three clusters, underscoring the significance of tailoring ESG and supply chains challenges.



**Figure 4.** Network visualization map of the author keywords.

#### **Cluster 1: Blue-Circular economy, sustainability and reverse logistics**

The emphasis on circular economy, sustainability, and reverse logistics in Cluster 1 highlights the growing importance of resource efficiency and waste reduction within supply chains. Circular economy principles focus on reusing, recycling, and reducing waste, aligning with sustainability goals by optimizing resource utilization and minimizing environmental impact. In supply chain management, adopting these practices can lower costs, reduce dependency on raw materials, and enhance resilience against resource scarcity. Reverse logistics, a crucial component of circular economy strategies, enables companies to reclaim products and materials, creating value from waste streams and supporting product life extension. Past studies, such as those by Govindan et al. (2014), emphasize that reverse logistics enhances sustainability by integrating environmentally friendly practices into product return processes. By fostering resource cycles and reducing landfill waste, circular economy and reverse logistics contribute to sustainability and fulfill the rising demand for responsible corporate practices in the ESG context, positively impacting brand reputation and regulatory compliance.

#### **Cluster 2: Green-Green logistics, GSCM, environmental sustainability**

The significance of green logistics, green supply chain management (GSCM), and environmental sustainability in Cluster 2 reflects a strategic shift toward minimizing

environmental impact within supply chains. Green logistics focuses on reducing emissions, energy consumption, and waste in transportation and warehousing, directly addressing environmental concerns. GSCM practices help companies integrate environmentally friendly processes across supply chain activities, including sourcing, production, and distribution. This integration is essential for reducing carbon footprints and achieving sustainability targets, especially as regulatory bodies and consumers demand greener practices. GSCM can increase operational efficiency by promoting waste reduction, resource conservation, and energy efficiency, thus creating cost savings. Environmental sustainability initiatives in supply chains also enhance a company's reputation and meet stakeholder expectations for ESG compliance. By embracing green logistics and GSCM, companies are better positioned to address environmental challenges, improve sustainability performance, and align with global standards for responsible operations.

### ***Cluster 3: Red-Supply chain, logistics, SCM & sustainable development***

The prominence of supply chain, logistics, supply chain management (SCM), and sustainable development in Cluster 3 highlights the strategic integration of environmental and social goals within core supply chain functions. Efficient SCM enables firms to streamline operations and align their logistics processes with sustainable development principles, supporting environmental responsibility while enhancing operational resilience. However, sustainable SCM incorporates economic, environmental, and social aspects to reduce resource use and waste across the supply chain. Sustainable development in supply chain practices also addresses stakeholder demands for ethical sourcing and reduced carbon emissions, positively impacting brand reputation and regulatory compliance. Embracing these principles helps companies anticipate and mitigate risks linked to resource scarcity, thus ensuring long-term profitability. By embedding sustainability in logistics and SCM, companies align with ESG requirements and gain competitive advantage through operational efficiency and improved stakeholder relationships, as observed in studies on sustainable SCM's impact on performance outcomes.

More specifically, the intersection of ESG standards and SCM has become a subject of research that reflects academics' growing awareness of the shift towards integrating sustainability into organizational management. The collective knowledge has increased substantially over the last decade as the world develops sustainable development and corporate responsibility strategies. The primary purpose of the research is to understand the integration of ESG concepts into the supply chain to enhance its performance and sustainability. As demonstrated using various samples, including the one by Friede et al. (2015), there is a positive relationship between ESG scores and financial performance. Thus, more would be written on the theme of ESG factors and how they could be tactically implemented. Moreover, global outreach initiatives like the United Nation's Sustainable Development Goals and the Paris Agreement have encouraged research activities, advocating innovative approaches of integrating ESG concerns in the supply chain or other supply chain management structures. The novelty of the ESG and SCM research is based on the methodological orientation that combines the analysis of ESG corporate development strategies with the development of innovative technologies. The latest studies (Asif et al., 2023; Chauhan et al., 2022) have adopted new technologies, such as blockchain, AI, and IoT, to enhance the availability of supply chain visibility and guarantee ESG compliance. This application could be considered a change in the

industry and offers new opportunities to bring profit with sustainable measures and solve operational challenges. Moreover, setting up the procedure of checklists and frameworks for ESG factors in supply chains leads to an emerging process showing increased industry responsibility and the ability to benchmark performance (Eskant et al., 2024). The above-discussed evolution underscores the necessity of employing sound scientific procedures to ensure that the established ESG programs lead to distinguishable and measurable improvements in sustainable performance levels.

Analyzing the given types of research publications and distinguishing between them helps to understand that the academic world is vast and continuously developing. Articles dominate the subject publication outlets, accounting for over 72% of the publications. This implies a relatively firm reliance on the research articles for disseminating new findings and theoretical advancement. Symposia papers, which constitute 10.42%, represent the engagement of the authors in the academic forum since their presentation provides the possibility for the exchange of information, as well as the fostering of working relationships. Thanks to the development of digital and open-access approaches, everyone can play an active role in not only consuming but also contributing to the results of the ESG and supply chain research efforts. It is still significant to note the variety of document kinds, which shows a versatile academic community that employs numerous media to amplify their message and outcomes, in this case, within the context of the financial area. The analysis of the available research articles on ESG issues and SCM in international journals reveals that many countries have actively contributed to the literature, which is quite beneficial for gaining varied perspectives and enriched insights. Thus, Indonesia and the United States represent the most significant contributors to the topic, as Indonesia has the largest number of published articles. At the same time, the United States appears to be the leader concerning the impact of citations. Indonesia cares more about local materiality while the US produces internationally relevant research of good quality. Integrating cultural, economic, and regulatory variation in the research activities contributes to regional differentiation, increasing knowledge stock. The global network of delivery services provides a more robust understanding of how the ESG principles need to be adapted and implemented depending on the scenario in the supply chain. This stresses cooperation with other global universities to enhance the research capacity to address worldwide sustainable challenges.

Despite this, the study has some limitations, which are majorly attributed to the procedure and logistics of tracking and implementing ESG standards in complex global and multi-tiered supply chains. One major issue that most organizations face is the lack of visibility beyond the first tier of their supply chains, which poses challenges in ascertaining compliance on matters concerning ESG. Also, since there are no standard ESG indices, some criticisms of the existing ESG rating models reveal the issue of comparing the ESG effectiveness of companies across sectors and industries. This is also a struggle with the study of greenwashing, whereby many organizations potentially overemphasize environmental or social responsibilities to gain investors. Secondly, methodology prioritizes bibliometric analysis, which might not reveal the qualitative data, or the practical issues related to applying ESG strategies while referring to a gap between theoretical and practical contexts. Future research on ESG and supply chain can be expected to analyze the application of more progressive technologies like Artificial Intelligence and Blockchain in improving the supply chain's transparency and efficacy. Also, there is a trend in the need for research to improve the reliability and

comparability of ESG metrics to reduce the issue of greenwashing. Another area of research could focus on ESG implementation issues unique to specific industries and countries since ESG initiatives rely on economic, cultural, and legislative differences. Furthermore, the subsequent research could focus on collaboration with scholars from other countries and investigate the opportunities to contribute to ESG debates and promote the use of ESG in solving worldwide sustainability issues. It also entails an analysis of the extent to which companies have incorporated the concept of digital transformation in the execution of their ESG frameworks and ways through which firms can ensure that their supply chain strategies are sustainable and responsive to the social and environmental bottom line.

## Conclusion

This bibliographic analysis of ESG factors in SCM provides valuable information on the ongoing pattern of sustainability management from the organization's perspective. The research also indicates a decade-on increase in related scholarly publications, caused by international endeavours towards sustainable development and corporate accountability. The PPE approach of adopting ESG criteria in SCM is not only a shift towards sustainability and protecting the company's financial future but also is an effectiveness of the UN SDGs and the Paris Agreement. This paper portrays how ESG and SCM involve multiple fields and disciplines and how state-of-the-art technologies like Blockchain, AI, and IoT are critical in promoting ESG compliance. By setting such metrics and frameworks, the research calls for more responsibility and comparability of ESG performance, which underlines the need for research-based evidence in sustainable performance. The study also shows a vibrant, complex academic system. It indicates that articles are the most published output type, thus revealing that researchers rely on the published literature to spread new knowledge and theories. The research also shows that countries like Indonesia and the United States of America have unique input and resource endowments, which enriched the global debate on ESG and SCM. The variety of research papers presented by authors from different countries and organizations proves the possibility of the effectiveness of cooperation in constructing a sustainable environment. However, the study also admits several boundaries in the current literature, such as the difficulty in supervising ESG standards when organizations have extensive supply chains with multiple echelons and the possibility of greenwashing. To avoid these events, supply chain research in the coming years should embrace novel technologies to provide additional transparency to supply chains and work on the creation of sound ESG measures. In this respect, similar efforts will entrench sustainability in the best practices in the supply chain, contributing to the achievement of environmental and social objectives in the supply chain and the overall economy.

## Acknowledgement

This research was independently financed. I would like to express my sincere gratitude to Universiti Tunku Abdul Rahman (UTAR) for equipping me with the research knowledge and academic guidance essential for completing this study.

## Conflict of interest

The authors confirm no conflict of interest involving any party in this research study.

## REFERENCES

- [1] Ahmi, A. (2021): Bibliometric Analysis for Beginners: A starter guide to begin with a bibliometric study using Scopus dataset and tools such as Microsoft Excel, Harzing's Publish or Perish and VOSviewer software. – UUM Press 193p.
- [2] Alsayegh, M.F., Abdul Rahman, R., Homayoun, S. (2020): Corporate economic, environmental, and social sustainability performance transformation through ESG disclosure. – Sustainability 12(9): 20p.
- [3] Asif, M., Searcy, C., Castka, P. (2023): ESG and Industry 5.0: The role of technologies in enhancing ESG disclosure. – Technological Forecasting and Social Change 195: 12p.
- [4] Bag, S., Telukdarie, A., Pretorius, J.C., Gupta, S. (2021): Industry 4.0 and supply chain sustainability: framework and future research directions. – Benchmarking: An International Journal 28(5): 1410-1450.
- [5] Benzidia, S., Makaoui, N., Bentahar, O. (2021): The impact of big data analytics and artificial intelligence on green supply chain process integration and hospital environmental performance. – Technological Forecasting and Social Change 165: 13p.
- [6] Burnham, J.F. (2006): Scopus database: a review. – Biomedical Digital Libraries 3: 1-8.
- [7] Chauhan, S., Singh, R., Gehlot, A., Akram, S.V., Twala, B., Priyadarshi, N. (2022): Digitalization of supply chain management with industry 4.0 enabling technologies: a sustainable perspective. – Processes 11(1): 22p.
- [8] Chit, I., Vasudevan, R. (2024): Navigating Compliance: Strategic Approaches Across Industries An Examination of Organizational Structures and Responses to Regulatory Changes. – Chalmers University of Technology 86p.
- [9] Coelho, R., Jayantilal, S., Ferreira, J.J. (2023): The impact of social responsibility on corporate financial performance: A systematic literature review. – Corporate Social Responsibility and Environmental Management 30(4): 1535-1560.
- [10] Dangelico, R.M., Vocalelli, D. (2017): "Green Marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature. – Journal of Cleaner Production 165: 1263-1279.
- [11] El-Hage, J. (2021): Fixing ESG: Are Mandatory ESG Disclosures the Solution to Misleading ESG Ratings? – Fordham Journal of Corporate & Financial Law 26(2): 359-390.
- [12] Eskantar, M., Zopounidis, C., Doumpos, M., Galaritis, E., Guesmi, K. (2024): Navigating ESG complexity: An in-depth analysis of sustainability criteria, frameworks, and impact assessment. – International Review of Financial Analysis 95: 11p.
- [13] Falagas, M.E., Pitsouni, E.I., Malietzis, G.A., Pappas, G. (2008): Comparison of PubMed, Scopus, web of science, and Google scholar: strengths and weaknesses. – The FASEB Journal 22(2): 338-342.
- [14] Farahani, R.Z., Rezapour, S., Drezner, T., Fallah, S. (2014): Competitive supply chain network design: An overview of classifications, models, solution techniques and applications. – Omega 45: 92-118.
- [15] Friede, G., Busch, T., Bassen, A. (2015): ESG and financial performance: aggregated evidence from more than 2000 empirical studies. – Journal of Sustainable Finance & Investment 5(4): 210-233.
- [16] Ghadimi, P., Wang, C., Lim, M.K. (2019): Sustainable supply chain modeling and analysis: Past debate, present problems and future challenges. – Resources, Conservation and Recycling 140: 72-84.

- [17] Govindan, K., Azevedo, S.G., Carvalho, H., Cruz-Machado, V. (2014): Impact of supply chain management practices on sustainability. – *Journal of Cleaner Production* 85: 212-225.
- [18] Hazen, B.T., Russo, I., Confente, I., Pellathy, D. (2021): Supply chain management for circular economy: conceptual framework and research agenda. – *The International Journal of Logistics Management* 32(2): 510-537.
- [19] Kouhizadeh, M., Saberi, S., Sarkis, J. (2021): Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers. – *International Journal of Production Economics* 231: 21p.
- [20] Meixell, M.J., Luoma, P. (2015): Stakeholder pressure in sustainable supply chain management: A systematic review. – *International Journal of Physical Distribution & Logistics Management* 45(1/2): 69-89.
- [21] Mitra, S., Datta, P.P. (2014): Adoption of green supply chain management practices and their impact on performance: an exploratory study of Indian manufacturing firms. – *International Journal of Production Research* 52(7): 2085-2107.
- [22] Mohsen, B.M. (2023): Developments of digital technologies related to supply chain management. – *Procedia Computer Science* 220: 788-795.
- [23] Nascimento, D.L.M., Alencastro, V., Quelhas, O.L.G., Caiado, R.G.G., Garza-Reyes, J.A., Rocha-Lona, L., Tortorella, G. (2019): Exploring Industry 4.0 technologies to enable circular economy practices in a manufacturing context: A business model proposal. – *Journal of Manufacturing Technology Management* 30(3): 607-627.
- [24] Nugroho, D.P., Hsu, Y., Hartauer, C., Hartauer, A. (2024): Investigating the Interconnection between Environmental, Social, and Governance (ESG), and Corporate Social Responsibility (CSR) Strategies: An Examination of the Influence on Consumer Behavior. – *Sustainability* 16(2): 22p.
- [25] Nwagwu, W.E. (2007): A Comparative Study of the Productivity of HIV/AIDS Literature on Nigeria and South Africa in Medline and Science Citation Index. – *African Journal of Library, Archives & Information Science* 17(1): 1-13.
- [26] Olanrewaju, O.I.K., Daramola, G.O., Babayeju, O.A. (2024): Transforming business models with ESG integration: A strategic framework for financial professionals. – *World Journal of Advanced Research and Reviews* 22(3): 554-563.
- [27] Pizzetti, M., Gatti, L., Seele, P. (2021): Firms talk, suppliers walk: Analyzing the locus of greenwashing in the blame game and introducing ‘vicarious greenwashing’. – *Journal of Business Ethics* 170(1): 21-38.
- [28] Qian, C., Gao, Y., Chen, L. (2023): Green supply chain circular economy evaluation system based on industrial internet of things and blockchain technology under ESG concept. – *Processes* 11(7): 22p.
- [29] Sardanelli, D., Bittucci, L., Mirone, F., Marzioni, S. (2022): An integrative framework for supply chain rating: from financial-based to ESG-based rating models. – *Total Quality Management & Business Excellence* 20p.
- [30] Sreedevi, R., Saranga, H. (2017): Uncertainty and supply chain risk: The moderating role of supply chain flexibility in risk mitigation. – *International Journal of Production Economics* 193: 332-342.
- [31] Tarigan, Z.J.H., Siagian, H., Jie, F. (2021): Impact of internal integration, supply chain partnership, supply chain agility, and supply chain resilience on sustainable advantage. – *Sustainability* 13(10): 18p.
- [32] Vezér, M., Sengupta, P., Mitra, S., Richter, H., Yuryeva, A., Sridharan, V., Rosi, V. (2022): An ESG Lens on Blockchain and Public Equities. In *Morningstar Sustainability Report*. – *Sustainalytics* 61p.
- [33] Vidrova, Z. (2020): Supply chain management in the aspect of globalization. – In *SHS Web of Conferences, EDP Sciences* 74: 10p.
- [34] Wieland, A. (2021): Dancing the supply chain: Toward transformative supply chain management. – *Journal of Supply Chain Management* 57(1): 58-73.

- [35] Zavala-Alcívar, A., Verdecho, M.J., Alfaro-Saiz, J.J. (2020): A conceptual framework to manage resilience and increase sustainability in the supply chain. – Sustainability 12(16): 38p.
- [36] Zumente, I., Lāce, N. (2021): ESG Rating-Necessity for the Investor or the Company? – Sustainability 13(16): 14p.