

BIBLIOMETRIC ANALYSIS OF OPPORTUNITIES IN THE HALAL SUPPLY CHAIN: MAPPING TRENDS, INNOVATIONS AND INDUSTRY PROSPECTS

Nadiyah Abdul Lateb¹
Irwandi Jaswir²
Betania Kartika³

¹ International Halal Research and Institute (INHART), International Islamic University Malaysia (IIUM), (E-mail: nadiyahlateb@gmail.com)

² International Halal Research and Institute (INHART), International Islamic University Malaysia (IIUM), Malaysia, (Email: irwandi@iium.edu.my)

³ International Halal Research and Institute (INHART), International Islamic University Malaysia (IIUM), (E-mail: betania@iium.edu.my)

Article history

Received date : 15-6-2024
Revised date : 16-6-2024
Accepted date : 29-9-2024
Published date : 30-9-2024

To cite this document:

Abdul Lateb, N., Jaswir, I. & Kartika, B. (2024). Bibliometric analysis of opportunities in the halal supply chain: Mapping trends, innovations and industry prospects. *Journal of Islamic, Social, Economics and Development (JISED)*, 9 (66), 76 – 96.

Abstract: *In today's constantly evolving halal ecosystem, understanding the halal supply chain trends and patterns is critical. Despite the expanding significance of the halal supply chain, there is still a lack of comprehensive analysis of how this phenomenon has been accepted and evolved in scholarly study. This gap impedes the development of a comprehensive understanding of the field's trends, difficulties and future directions. Using a bibliometric analysis, this study investigated scholarly 222 articles on halal supply chains from 2000 to 2023, obtained from Scopus analytics. We utilised tools such as VOSviewer to visualise patterns in author productivity, co-authorship networks and keyword co-occurrence. The analysis is based on the number of publications, author contributions, multidisciplinary nature and worldwide collaboration trends in the subject. This study expects to identify key scholars and their impact on the area, trends in research subjects and the growth of the halal supply chain themes throughout time. This bibliometric analysis research seeks to offer a complete overview of the halal supply chain as an academic area, emphasising its multidisciplinary nature and worldwide impact. By tracing adoption trends and patterns, the study provides valuable insights into the growth of the halal supply chain and its role in influencing the halal economy, directing future research and practices in this vigorous domain.*

Keywords: *Bibliometric Analysis, Halal Supply Chain, Poultry Industry, Halal Integrity*

Introduction

The halal supply chain, a multifaceted ecosystem encompassing diverse industries, has witnessed a surge in global attention driven by factors such as increased consumer awareness, globalization, and advancements in technology (Firdiansyah et al., 2021; Muhammad et al., 2016; Sukati & Bawaain, 2019). In the wake of this growing interest, a complete understanding of the opportunities within the halal supply chain is crucial for stakeholders ranging from businesses to policymakers and researchers. This study aims to conduct a rigorous bibliometric analysis to map the trends, innovations, and industry prospects in the Halal supply chain, providing an evidence-based foundation for strategic decision-making and further research endeavours.

In recent years, the Halal market has expanded beyond its traditional confines, becoming a prominent player in global industries such as food, cosmetics, pharmaceuticals, and logistics. This diversification reflects not only the increasing purchasing power of the global Muslim population but also a broader demand for ethical and sustainable products. As a result, the opportunities within the halal supply chain are evolving, presenting a complex landscape that requires systematic exploration. This study seeks to navigate this landscape through the lens of bibliometrics, a powerful method for analyzing and visualizing scholarly literature, to unveil patterns, relationships, and key insights.

The globalization of markets has not only widened the reach of halal products but has also fostered cross-cultural exchanges that impact the Halal supply chain. As a consequence, researchers, industry practitioners, and policymakers face the challenge of staying abreast of the latest developments and emerging opportunities. Bibliometric analysis provides a unique advantage in this context, offering a quantitative and qualitative evaluation of the scholarly literature. By mapping trends, identifying innovations, and delineating industry prospects, this study aims to serve as a compass, guiding stakeholders through the complex terrain of the halal supply chain.

As the global community continues to grapple with issues of sustainability, ethical sourcing, and supply chain resilience, the halal supply chain stands at the intersection of these concerns. Through a bibliometric exploration, this study endeavours to not only shed light on existing opportunities but also to lay the foundation for future research directions and industry strategies that align with evolving market dynamics and societal expectations. In essence, the forthcoming analysis seeks to be a catalyst for informed decision-making in the dynamic landscape of the halal supply chain.

Literature Review

The halal supply chain, representing a nexus of commerce and cultural adherence to Islamic principles, has emerged as a dynamic sector in the global marketplace. The foundational underpinning of the halal supply chain is expounded through a corpus of literature that dissects its operative components. Studies by Iranmanesh et al. (2021) and Indarti & Lukito-budi (2020) underscore the criticality of certification processes, logistics, and market trends in shaping the contemporary halal supply chain landscape. The present discourse extends these insights by engaging in a bibliometric analysis, offering a methodological lens to discern emergent patterns and opportunities within this domain.

Innovation, a recurrent theme within the halal supply chain is expounded by authors such as Masudin et al. (2022) and Azmi et al. (2018). Technological advancements, production

processes, traceability, and quality assurance emerge as pivotal constituents of innovation within the halal supply chain. The present article contributes to this body of knowledge by synthesizing existing research and utilizing bibliometric analysis to discern the contours of innovative trajectories, providing a nuanced understanding of the transformative forces at play. A nuanced comprehension of the halal supply chain demands consideration of its geographical nuances. A study by Mohd Helmi Ali & Suleiman (2018) and Naeem et al. (2019) has laid the groundwork for understanding regional disparities and collaboration opportunities. Building upon this foundation, the article scrutinizes the global distribution of research activities through bibliometric lenses, offering insights into collaborative potentials and regional idiosyncrasies.

Collaboration, both institutional and interdisciplinary, emerges as a recurrent motif within the extant literature on the halal supply chain. Research clusters and influential authors, as identified through bibliometric analysis, become pivotal players in fostering collaborative networks and knowledge exchange. By accentuating these collaborative dynamics, the article not only contributes to the scholarly tapestry but also presents actionable insights for practitioners, policymakers, and researchers.

In conclusion, the literature review encapsulates the evolution of scholarly discourse surrounding the halal supply chain, situating the recent article on bibliometric analysis within the broader academic landscape. Through methodological rigour, thematic exploration, and a synthesis of diverse perspectives, the review elucidates the scholarly contributions of the article, offering a nuanced understanding of opportunities, trends, and innovations within the halal supply chain. This academic endeavour not only augments the current state of knowledge but also catalyzes future trajectories of inquiry within this burgeoning domain. A comprehensive review of the existing literature reveals a growing interest in understanding the dynamics of the halal supply chain. Several scholars have explored various aspects of halal supply chain management, ranging from certification processes to consumer behaviour. However, there is a noticeable gap in the literature concerning a systematic and bibliometric examination of the opportunities within the halal supply chain. This section presents an overview of relevant previous research.

Research Question

In this context, the research questions addressed in this study are as follows:

- i. What are the historical trends in research output in a particular field over the past decade?
- ii. Who writes the most productive authors' topic articles?
- iii. What are the documents by subject area?
- iv. What is the number of citations?
- v. What are the popular keywords related to the study?
- vi. What are co-authorship countries' collaboration?
- vii. What is co-citation by the cited author?

Methodology

Bibliometric refers to the combination, management and analysis of bibliographic information derived from scientific publications (Padrós-Cuxart et al., 2016). Along with general descriptive statistics, such as publishing journals, publication year and main author classification, it also comprises complex techniques, such as document co-citation analysis. A successful literature review necessitates an iterative process involving the identification of appropriate keywords, literature search, and thorough analysis to build a comprehensive

bibliography and yield dependable results. In light of this, the study sought to focus on top-tier publications, as they offer valuable insights into the theoretical perspectives shaping the evolution of the research domain. To ensure data reliability, the study relied on the SCOPUS database for data collection. Moreover, to ensure the inclusion of high-quality publications, only articles published in rigorously peer-reviewed academic journals were considered, with a deliberate exclusion of books and lecture notes. Notably, Elsevier’s Scopus, known for its extensive coverage, facilitated the collection of publications spanning from 2020 to December 2023 for subsequent analysis.

Bibliometric analysis, as a methodological apparatus, has witnessed increased adoption in understanding trends and innovations across diverse disciplines. Scholars such as Afraz et al. (2022) and Bayu et al. (2022) have advanced the discourse surrounding bibliometrics, underscoring its utility in visualizing scholarly landscapes. In alignment with this scholarly trajectory, the article in focus employs bibliometric methodologies to unravel latent opportunities within the halal supply chain. This methodological synergy reflects a commitment to advancing empirical rigour in the exploration of industry prospects.

Data search strategy

The study employed a screening sequence to determine the search terms for article retrieval. The study was initiated by querying the Scopus database with TITLE-ABS-KEY (halal AND supply AND chain) thereby assembling 368 articles. The final search string TITLE-ABS-KEY (halal AND industry) AND PUBYEAR > 2008 AND PUBYEAR < 2023 AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (DOCTYPE , "ar")) refinement included 222 articles which were used for bibliometric analysis. As of December 2023, all articles from the Scopus database relating to the halal supply chain were incorporated into the study.

Table 1: The Search String

| |
|---|
| LE-ABS-KEY (halal AND supply AND chain) AND PUBYEAR > 2007 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) |
|---|

Table 2: The Selection Criterion is Searching

| Criterion | Inclusion | Exclusion |
|------------------|-------------------|--------------------------|
| Language | English | Non-English |
| Time line | 2008 – 2023 | < 2008 |
| Literature type | Journal (Article) | Conference, Book, Review |

Data analysis

In the ever-expanding realm of academic research, bibliometric analysis has become an essential tool for understanding research trends, collaboration networks, and thematic developments. The choice of software for such analysis is crucial, as it determines the accuracy, depth, and clarity of the insights gained. VOSviewer, a widely recognized tool for bibliometric mapping, offers unique advantages that make it an ideal choice for analyzing the halal supply chain literature.

VOSviewer is renowned for its robust visualization capabilities, allowing researchers to create detailed maps of research landscapes. It excels in producing network visualizations that are easy to interpret, which is particularly useful for exploring complex relationships between authors, keywords, and countries. The software’s ability to generate clear and intuitive visualizations

enables researchers to identify patterns and trends at a glance, facilitating an enhanced understanding of the research area. The software is specifically designed to handle large bibliometric data sets, making it ideal for comprehensive analyses of extensive literature. VOSviewer efficiently processes and visualizes large volumes of bibliometric data from sources like Scopus and Web of Science, providing researchers with the ability to explore detailed citation and co-authorship networks. VOSviewer offers a user-friendly interface that simplifies the bibliometric analysis process. Its intuitive design allows researchers, including those with limited technical expertise, to navigate the software with ease. This accessibility is critical for enabling scholars from various disciplines to conduct bibliometric analyses without requiring extensive training (Donthu et al., 2021).

The software provides a huge range of bibliometric analyses, including co-authorship, co-occurrence, citation, bibliographic coupling, and co-citation analyses. Researchers can customize visualizations to focus on specific aspects of the literature, tailoring the analysis to their research questions. This versatility allows for a comprehensive exploration of the halal supply chain field, accommodating various analytical needs. VOSviewer integrates seamlessly with other bibliometric tools and data sources, enhancing its analytical capabilities. Researchers can combine VOSviewer with other software to conduct more sophisticated analyses, benefiting from the strengths of multiple tools. This integration facilitates a holistic approach to bibliometric research.

Recent studies have demonstrated the effectiveness of VOSviewer in bibliometric analyses across various fields. For example, a study by Eck & Waltman (2019) highlighted the software's utility in mapping scientific fields and exploring research trends. Another study applied VOSviewer to analyze global research on sustainable development, showcasing its ability to visualize complex research networks. These examples illustrate VOSviewer's adaptability and effectiveness in uncovering valuable insights from diverse academic domains.

VOSviewer stands out as a premier tool for bibliometric analysis due to its powerful visualization capabilities, ability to handle large data sets, user-friendly interface, and versatility. These features make it an ideal choice for analyzing the halal supply chain literature, enabling researchers to explore collaboration networks, thematic developments, and research trends comprehensively. By leveraging VOSviewer's strengths, researchers can gain valuable insights into the evolving landscape of halal supply chain research, contributing to the advancement of knowledge and practice in this important field (Moral-muñoz et al., 2020).

Findings and Discussion

What are the historical trends in research output in a particular field over the past decade?

The graph in Figure 1 indicates From 2010 to 2023, research on the halal supply chain has experienced significant growth, as evidenced by the increase in the number of publications. In the early 2010s, scholarly output was modest, with the field still emerging as a distinct area of academic inquiry. These foundational years involved establishing frameworks and methodologies to better understand the unique aspects of the halal supply chain, including compliance with religious standards, traceability, and consumer trust. As the decade progressed, particularly from 2015 onwards, there was a noticeable increase in publications, signalling growing interest and investment in this area. By 2018, research output had gained momentum, reflecting the increasing recognition of the halal supply chain's economic and cultural

importance. This period saw the integration of new technologies and methodologies aimed at enhancing efficiency and transparency, including blockchain for traceability and advanced logistics management systems. Overall, the statistic represents the rapid and ever-growing scholarly study on the halal supply chain, highlighting its crucial significance and pivotal influence on current conversations about the future merging of the halal supply chain field.

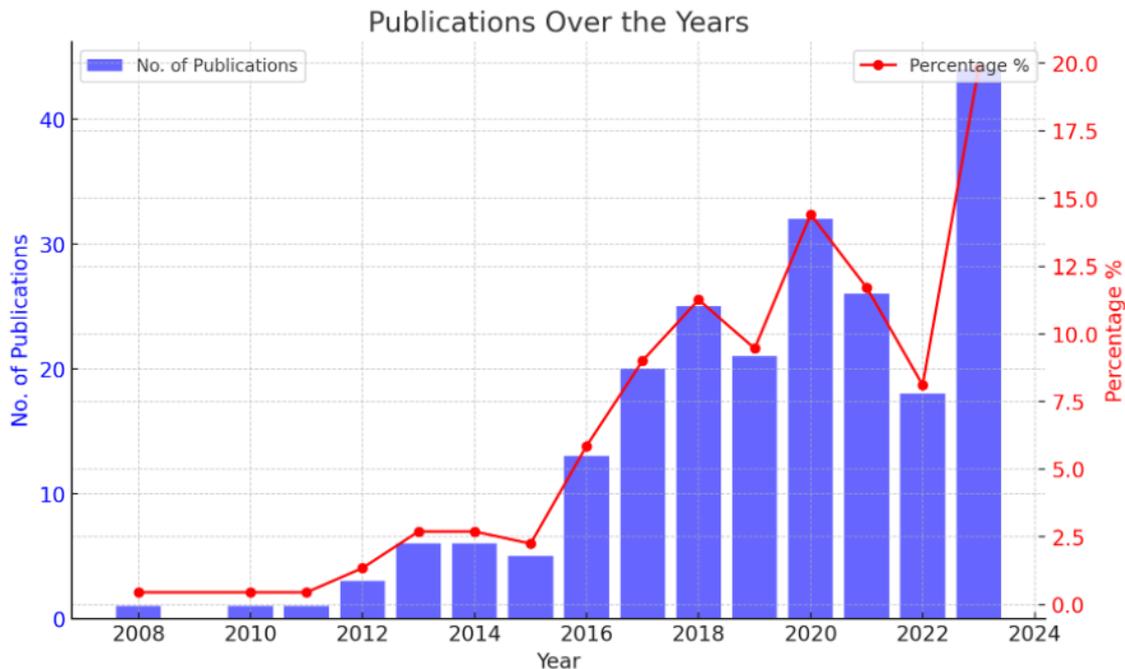


Figure 1: The Growth Number of Papers Published on the Subject of the Halal Supply Chain Between 2008 and 2023

The data obtained from Scopus analytics displays a notable increase in the number of papers published on the topic of halal supply chains between 2008 and 2023 (Table 3). This can be seen as a clear indication of the growing interest and scholarly engagement in this sector.

Table 3: The Percentage of Papers Published on The Subject of Halal Supply Chain Between 2008 and 2023

| Year | No. of Publications | Percentage % |
|--------------|---------------------|----------------|
| 2023 | 44 | 19.82% |
| 2022 | 18 | 8.11% |
| 2021 | 26 | 11.71% |
| 2020 | 32 | 14.41% |
| 2019 | 21 | 9.46% |
| 2018 | 25 | 11.26% |
| 2017 | 20 | 9.01% |
| 2016 | 13 | 5.86% |
| 2015 | 5 | 2.25% |
| 2014 | 6 | 2.70% |
| 2013 | 6 | 2.70% |
| 2012 | 3 | 1.35% |
| 2011 | 1 | 0.45% |
| 2010 | 1 | 0.45% |
| 2008 | 1 | 0.45% |
| Total | 222 | 100.00% |

Table 3 shows the percentage of papers published on the subject of halal supply chains between 2008 and 2023. The publication count shows a general increasing trend over the years, with significant growth in recent years. This indicates rising interest and research activity in the halal supply chain domain.

The data on research output in the halal supply chain from 2010 to 2023 reveals a significant upward trend, reflecting the growing importance and complexity of the field. In the early years, research was sparse, with only one publication each in 2010, 2011, and 2008, indicating that the field was still in its formative stages. During this period, foundational studies focused on defining the halal supply chain, understanding its unique characteristics, and establishing the baseline knowledge necessary for future exploration.

The turning point came in the mid-2010s, as scholarly interest began to grow. From 2015 to 2018, the number of publications increased steadily, with research output nearly doubling each year. This surge can be attributed to several factors, including the globalization of the halal market, increased consumer awareness, and the recognition of halal certification as a critical aspect of global trade. By 2018, the annual output reached 25 publications, representing 11.26% of the total research conducted over the period.

The most notable peaks in research output occurred in 2020 and 2023, with 32 and 44 publications, respectively. These peaks highlight periods of intense academic activity and innovation within the halal supply chain. The peak in 2020 coincides with the global COVID-19 pandemic, which disrupted supply chains worldwide and underscored the need for resilience and adaptability. Researchers likely focused on how halal supply chains could withstand such challenges, exploring innovations in logistics, technology, and compliance to ensure continuity and trust.

The subsequent peak in 2023 suggests a sustained and growing interest in optimizing the halal supply chain. This period may have been influenced by advancements in digital technologies, such as blockchain for enhanced traceability and transparency, as well as artificial intelligence for optimizing logistics and forecasting demand. These innovations are critical for maintaining consumer trust and ensuring that halal products meet rigorous standards.

Despite the overall growth, the data also reveals periodic fluctuations, with a noticeable dip in publications in 2022. Such variations could be attributed to shifts in research priorities, changes in funding landscapes, or broader economic and political factors influencing academic productivity. Understanding these fluctuations is essential for identifying the drivers and barriers to research activity within the halal supply chain.

The analysis of research trends over the past decade highlights the halal supply chain as a field characterized by continuous innovation and adaptation. The integration of technology, particularly digital solutions like blockchain and AI, represents a significant area of innovation, enhancing traceability, compliance, and efficiency. These advancements are crucial for navigating the complexities of the halal supply chain and addressing the challenges posed by globalization and increased consumer demand.

Looking forward, the halal supply chain presents numerous opportunities for growth and diversification. As consumer awareness and demand for halal products continue to rise, there is a growing need for research on sustainable practices, integration with circular economy principles, and the role of policy in shaping supply chain dynamics. Future research should also

focus on exploring the intersections between halal certification and other emerging trends, such as ethical sourcing, environmental impact, and social responsibility.

In conclusion, the past decade has witnessed significant growth and transformation in the halal supply chain, driven by a combination of technological advancements and increasing global demand. The bibliometric analysis highlights key trends and innovations that have shaped the field, offering insights into potential areas for future exploration and development. As the halal supply chain continues to evolve, it remains a vital area of research and industry focus, poised to make substantial contributions to global trade and consumer markets. Using the insights acquired from this analysis, stakeholders may better navigate the challenges and chances that lie ahead, guaranteeing the halal supply chain stays safe, sustainable, and competitive globally.

Who writes the most productive authors' topic articles?

Documents by author

Compare the document counts for up to 15 authors.

Scopus

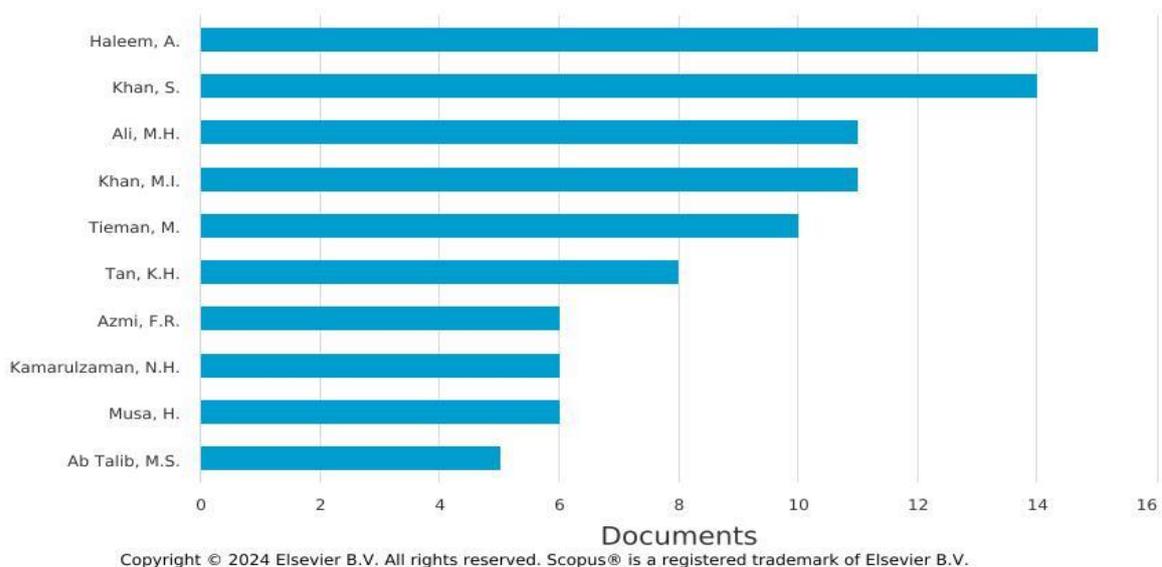


Figure 2: Analysis of Most Productive Authors in the Halal Supply Chain

Table 4: The Most Productive Author Percentage in the Halal Supply Chain

| Author Name | No. of Publications | Percentage % |
|--------------------|---------------------|--------------|
| Haleem, A. | 15 | 16.30% |
| Khan, S. | 14 | 15.22% |
| Ali, M.H. | 11 | 11.96% |
| Khan, M.I. | 11 | 11.96% |
| Tieman, M. | 10 | 10.87% |
| Tan, K.H. | 8 | 8.70% |
| Azmi, F.R. | 6 | 6.52% |
| Kamarulzaman, N.H. | 6 | 6.52% |
| Musa, H. | 6 | 6.52% |
| Ab Talib, M.S. | 5 | 5.43% |
| Total | 92 | 100.00% |

This part focuses on the most productive authors in the halal supply chain, exploring their contributions and the impact of their work on the field as shown in Figure 2 and Table 4. By examining the data on author productivity, we aim to highlight the key individuals whose research has significantly influenced the development and understanding of the halal supply chain.

The data reveals a total of 92 publications attributed to ten leading authors, indicating a concentrated body of work within the halal supply chain field. Among these scholars, Haleem, A. stands out as the most prolific author, contributing 15 publications, which account for 16.30% of the total output. Haleem's work likely encompasses a broad range of topics within the halal supply chain, from foundational studies to cutting-edge innovations, positioning them as a central figure in the field.

Following closely is Khan, S., with 14 publications representing 15.22% of the total. Khan's research may focus on key challenges and opportunities within the halal supply chain, contributing valuable insights and frameworks that have advanced the field's understanding. Together, Haleem and Khan have contributed a significant portion of the research output, underscoring their roles as thought leaders and influencers in the academic community.

Ali, M.H. and Khan, M.I. each have 11 publications, accounting for 11.96% of the total output. Their contributions likely cover various aspects of the halal supply chain, such as logistics, compliance, and consumer behaviour. These authors have helped to expand the field's knowledge base, providing a foundation for future research and innovation.

Tieman, M. is another notable contributor, with 10 publications (10.87%). Tieman's research might explore the integration of traditional halal principles with modern supply chain practices, offering insights into how these systems can coexist and thrive in a globalized world. Similarly, Tan, K.H. has contributed 8 publications (8.70%), likely focusing on the intersection of technology and the Halal supply chain, highlighting opportunities for efficiency and transparency through digital solutions.

The remaining authors, Azmi, F.R., Kamarulzaman, N.H., and Musa, H., each have 6 publications, representing 6.52% of the total output. These scholars have likely contributed niche studies or specialized research that addresses specific challenges within the Halal supply chain. Ab Talib, M.S. rounds out the list with 5 publications (5.43%), adding further depth and diversity to the field's body of knowledge.

The productivity of these authors highlights their significant contributions to advancing the halal supply chain's academic and practical understanding. Their research has likely addressed critical issues such as compliance with halal standards, the integration of technology, and the impact of globalization on halal supply chains. By exploring these areas, these authors have provided valuable insights that have informed policy decisions, industry practices, and future research directions. Moreover, the concentration of publications among a small group of authors suggests a collaborative and interconnected research community. These scholars may engage in joint projects, cross-institutional collaborations, and interdisciplinary research, further enriching the field and fostering innovation.

In conclusion, the analysis of the most productive authors in the halal supply chain reveals a dynamic and influential group of scholars who have played a pivotal role in shaping the field.

Their contributions have advanced the academic discourse, informed industry practices, and highlighted the opportunities and challenges facing the halal supply chain. As the field continues to evolve, these authors will likely remain at the forefront of research and innovation, driving the halal supply chain toward a more sustainable, efficient, and globally integrated future. Recognizing and building upon their work will be crucial for the continued growth and development of this vital area of study.

What are the documents by subject area?

Documents by subject area

Scopus

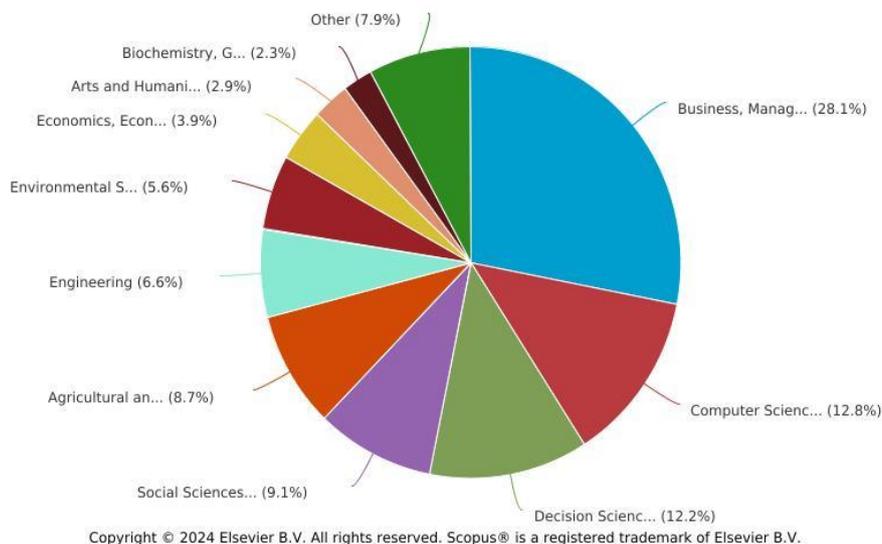


Figure 3: The Distribution of Documents According to the Subject Area in the Halal Supply Chain

Table 5: The Distribution Percentage of Documents According to Subject Area in the Halal Supply Chain

| Subject Area | No. of Publications | Percentage % |
|--|---------------------|----------------|
| Business, Management and Accounting | 136 | 30.49% |
| Computer Science | 62 | 13.90% |
| Decision Sciences | 59 | 13.23% |
| Social Sciences | 44 | 9.87% |
| Agricultural and Biological Sciences | 42 | 9.42% |
| Engineering | 32 | 7.17% |
| Environmental Science | 27 | 6.05% |
| Economics, Econometrics and Finance | 19 | 4.26% |
| Arts and Humanities | 14 | 3.14% |
| Biochemistry, Genetics and Molecular Biology | 11 | 2.47% |
| Total | 446 | 100.00% |

The halal supply chain represents a multifaceted area of study that intersects with various disciplines, reflecting its complex and dynamic nature. As global demand for halal products grows, research in this field has expanded across multiple subject areas, each contributing unique insights and perspectives. This analysis examines the distribution of research publications in the halal supply chain according to subject areas, providing a comprehensive overview of how different disciplines contribute to understanding and advancing this vital field as shown in Figure 3 and Table 5.

The data reveals a total of 446 publications, distributed across ten subject areas. This distribution highlights the interdisciplinary nature of halal supply chain research, with each field offering distinct contributions to the body of knowledge.

With 136 publications, the business, management, and accounting (30.49%) area holds the largest share, reflecting the critical role of business strategies, management practices, and accounting standards in optimizing halal supply chains. Research in this area likely explores supply chain management, logistics, strategic planning, and financial considerations essential for maintaining compliance and efficiency in the halal industry.

Computer science (13.90%) contributes 62 publications, underscoring the importance of digital technologies in transforming the halal supply chain. Innovations in information technology, data analytics, and cybersecurity are crucial for enhancing traceability, transparency, and efficiency. This area also explores how technologies like blockchain and AI can address challenges related to compliance and consumer trust.

With 59 publications, decision sciences (13.23%) emphasize the analytical and strategic aspects of the halal supply chain. Research in this field focuses on optimizing decision-making processes, risk management, and predictive modelling to enhance supply chain performance and resilience.

Social sciences (9.87%) contribute 44 publications, providing insights into the cultural, societal, and ethical dimensions of the Halal supply chain. This area explores consumer behaviour, cultural influences, and the social impact of Halal certification, emphasizing the importance of understanding diverse consumer preferences and values.

With 42 publications, agricultural and biological sciences (9.42%) highlight the significance of agricultural practices and biological considerations in the halal supply chain. Research focuses on sustainable farming, animal welfare, and the biological processes involved in producing halal-compliant products, ensuring alignment with religious and ethical standards.

Engineering (7.17%) contributes 32 publications, reflecting the role of technological innovations and infrastructure development in the halal supply chain. This field explores advancements in process engineering, logistics systems, and packaging technologies that enhance supply chain efficiency and sustainability.

With 27 publications, environmental science (6.05%) addresses the ecological and sustainability aspects of the halal supply chain. Research focuses on reducing environmental impact, promoting sustainable practices, and integrating green technologies to ensure the long-term viability of Halal supply chains.

Economics and finance (4.26%) contribute 19 publications, exploring the economic implications and financial dynamics of the halal supply chain. This area examines market trends, financial performance, and economic policies that influence the growth and competitiveness of the halal industry.

With 14 publications, arts and humanities (3.14%) offer unique perspectives on the cultural and historical contexts of the Halal supply chain. Research explores the cultural narratives, ethical considerations, and historical evolution of Halal practices, enriching the understanding of this field's socio-cultural dimensions.

Biochemistry, genetics, and molecular biology (2.47%) with 11 publications, highlight the scientific and technical aspects of halal product development. Research focuses on genetic analysis, molecular biology, and biochemical processes that ensure the safety, quality, and compliance of halal products.

The diverse distribution of research across subject areas underscores the interdisciplinary nature of the halal supply chain, highlighting the need for collaboration and integration among various disciplines. Each field contributes unique insights that are crucial for addressing the complexities and challenges of halal supply chain management. As the field continues to evolve, fostering interdisciplinary research and collaboration will be essential for driving innovation, enhancing sustainability, and meeting the growing global demand for halal products.

In conclusion, the distribution of research publications across subject areas reflects the multifaceted nature of the halal supply chain, with each discipline offering valuable contributions to understanding and advancing this field. By leveraging insights from diverse subject areas, stakeholders can develop comprehensive strategies that address the challenges and opportunities within the halal supply chain. As research continues to expand, fostering interdisciplinary collaboration will be key to ensuring the halal supply chain remains resilient, efficient, and aligned with the evolving needs of consumers and markets worldwide.

What is the number of citations?

Table 6: The Top Ten Authors Of Citation In Halal Supply Chain

| Author | Title | Publication Year | Source Title | Cited By |
|-------------------------|---|------------------|---|----------|
| (Tieman, 2011) | The application of Halal in supply chain management: In-depth interviews | 2011 | Journal of Islamic Marketing | 206 |
| (Bonne & Verbeke, 2008) | Religious values informing halal meat production and the control and delivery of halal credence quality | 2008 | Agriculture and Human Values | 199 |
| (Tieman et al., 2012) | Principles in Halal supply chain Management | 2012 | Journal of Islamic Marketing | 167 |
| (Ab Talib et al., 2015) | Halal supply chain critical success factors: A literature review | 2015 | Journal of Islamic Marketing | 112 |
| (Soon et al., 2017) | Halal integrity in the food supply chain | 2017 | British Food Journal | 106 |
| (M.H. Ali et al., 2021) | A sustainable Blockchain framework for the halal food supply chain: Lessons from Malaysia | 2021 | Technological Forecasting and Social Change | 102 |

| | | | | | |
|-------------------------------|---|------|------------------------------|---------|----|
| (Hew et al., 2020) | The blockchain-based Halal traceability systems: a hype or reality? | 2020 | Supply Management | Chain | 92 |
| (Zailani et al., 2017) | Halal logistics opportunities and challenges | 2017 | Journal of Marketing | Islamic | 84 |
| (Khan et al., 2018) | Implementing traceability systems in specific supply chain management (SCM) through critical success factors (CSFs) | 2018 | Sustainability (Switzerland) | | 82 |
| (Mohd Helmi Ali et al., 2017) | A supply chain integrity framework for halal food | 2017 | British Food Journal | | 82 |

Citations are a key metric for gauging the influence and impact of academic work within a field. In the context of the halal supply chain, analyzing the most-cited authors provides insights into the foundational studies and influential contributions that have shaped the discourse. This part examines the top ten authors based on citation counts, highlighting their key works and the significance of their research in advancing the understanding of the halal supply chain as shown in Table 6.'

With 206 citations, Tieman, M. (2011) "The Application of Halal in Supply Chain Management: In-depth Interviews" is the most cited among the top ten, emphasizing its foundational role in understanding the integration of halal principles in supply chain management. Tieman's research focuses on qualitative insights gathered through in-depth interviews, exploring how halal values can be operationalized within supply chains to ensure compliance and integrity.

Bonne & Verbeke (2008) "Religious Values Informing Halal Meat Production and The Control and Delivery of Halal Credence Quality" are cited 199 times. This study investigates the intersection of religious values and quality assurance in halal meat production. The authors provide a comprehensive analysis of how religious beliefs shape consumer expectations and the mechanisms necessary to deliver halal quality credence, influencing both production and consumption patterns.

With 167 citations, Tieman et al. (2012) "Principles in Halal Supply Chain Management" further establishes Tieman's influence in the field by delineating key principles guiding halal supply chain management. The study provides a structured framework that identifies critical areas such as logistics, compliance, and consumer trust, contributing significantly to the theoretical development of halal supply chain management.

Ab Talib et al. (2015) "Halal Supply Chain Critical Success Factors: A Literature Review" cited 112 times, identifies and analyzes the critical success factors essential for effective Halal supply chain management. The authors synthesize findings from various studies, highlighting themes such as stakeholder collaboration, regulatory compliance, and consumer perception, offering a roadmap for both scholars and practitioners.

With 106 citations, Soon et al. (2017) "Halal Integrity in the Food Supply Chain" explores the concept of halal integrity within the food supply chain, addressing challenges related to authenticity, traceability, and fraud prevention. Their research emphasizes the importance of maintaining trust and transparency in halal food supply chains, a theme increasingly relevant in today's globalized markets.

Cited 102 times, M.H. Ali et al. (2021) “A Sustainable Blockchain Framework for the Halal Food Supply Chain: Lessons from Malaysia” focuses on leveraging blockchain technology to enhance sustainability and transparency in the halal food supply chain. Ali and his co-authors draw on case studies from Malaysia, illustrating how digital innovations can address critical challenges and improve supply chain efficiency.

Hew et al. (2020) “The Blockchain-based Halal Traceability Systems: a Hype or Reality?” cited 92 times. this study critically examines the feasibility and effectiveness of blockchain-based traceability systems in the halal supply chain. Hew and colleagues evaluate the potential benefits and limitations of these systems, providing insights into their practical applications and the hype surrounding emerging technologies.

Cited 84 times, Zailani et al. (2017) “Halal Logistics Opportunities and Challenges” explores the logistics dimensions of the halal supply chain, identifying opportunities and challenges that shape the industry's landscape. The authors discuss strategies for optimizing logistics processes while ensuring compliance with halal standards, a crucial aspect of supply chain management.

Khan et al. (2018) “Implementing Traceability Systems in Specific Supply Chain Management (SCM) through Critical Success Factors (CSFs)” cited with 82 citations, delve into the implementation of traceability systems in supply chain management, emphasizing the role of critical success factors. Khan and colleagues highlight the importance of technology, stakeholder collaboration, and regulatory frameworks in achieving effective traceability and enhancing supply chain transparency.

Cited 82 times, Mohd Helmi Ali et al. (2017) “A Supply Chain Integrity Framework for Halal Food” presents a comprehensive framework for ensuring integrity within Halal food supply chains. The authors focus on elements such as authentication, traceability, and consumer trust, providing a holistic approach to managing the complexities of halal supply chains.

The high citation counts of these works underscore their significant impact on the halal supply chain field. These studies have laid the groundwork for understanding critical concepts such as compliance, traceability, and consumer trust. By addressing key challenges and exploring innovative solutions, these authors have contributed to the theoretical and practical advancement of the halal supply chain.

In conclusion, the top-cited authors in the halal supply chain field have made substantial contributions that have shaped the discourse and advanced the industry's understanding. Their research has provided valuable frameworks, insights, and innovations that continue to inform both academic and industry practices. As the field evolves, these works will remain foundational, guiding future research and development in the halal supply chain. By building on the insights of these influential authors, stakeholders can better address the challenges and opportunities within this dynamic and growing sector.

What are the popular keywords related to the study?

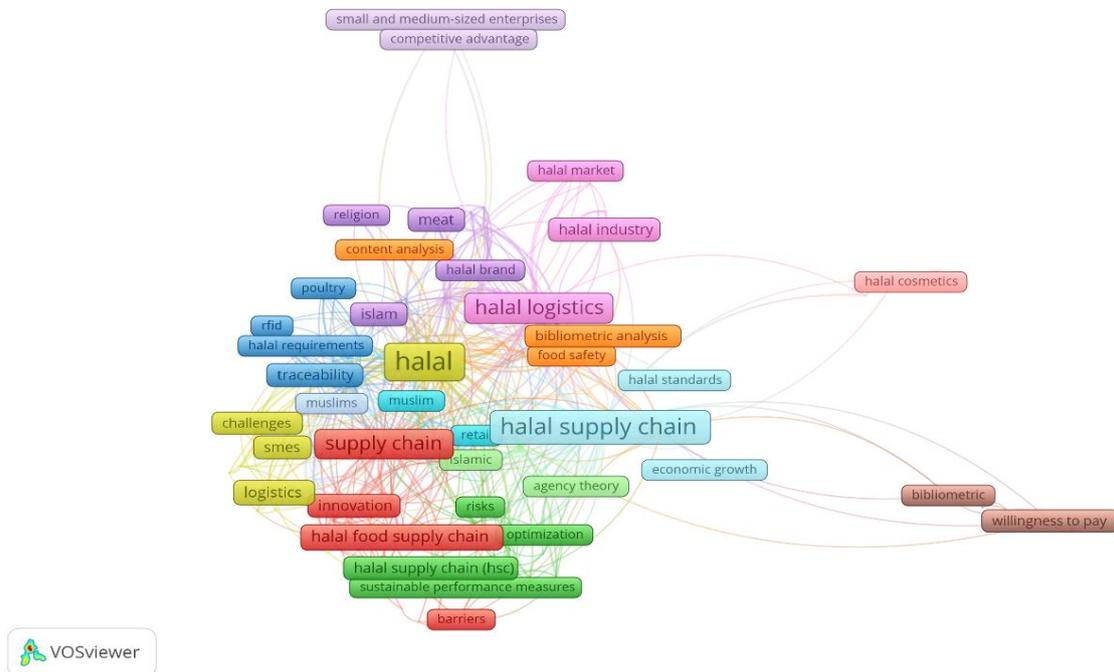


Figure 4: The Popular Keywords Related to the Halal Supply Chain

Figure 4 provides a bibliometric network visualization generated using VOSviewer, illustrating the co-occurrence of keywords related to the halal supply chain. The nodes represent various keywords, and the links indicate the frequency and strength of co-occurrence in academic literature. The size of each node reflects the prominence of the keyword, while the colour coding denotes clusters of related terms. By examining a bibliometric network visualization of keyword co-occurrence, we can gain valuable insights into the prominent topics, relationships, and future directions within the halal supply chain domain. This part explores the central themes and emerging areas of interest providing a comprehensive overview of the evolving landscape of the halal supply chain.

The bibliometric visualization reveals that the halal supply chain is the central theme around which other keywords are clustered. This prominence underscores the importance of supply chain management in ensuring the integrity, efficiency, and compliance of halal products. The keyword halal logistics is closely linked to the supply chain, highlighting logistics as a critical component in managing the complex processes involved in halal certification and distribution. The general term supply chain also appears prominently, indicating the integration of halal principles within broader supply chain management frameworks. This integration reflects the multifaceted nature of halal supply chains, which must navigate religious, regulatory, and market considerations to deliver products that meet consumer expectations and legal requirements.

Several clusters of related terms emerge from the visualization, each representing distinct areas of focus within halal supply chain research. Technology and Innovation cluster includes keywords such as traceability, RFID, innovation, and logistics, highlighting the role of technological advancements in enhancing supply chain operations. The focus on traceability reflects the growing demand for transparency and accountability in halal products, as consumers and regulators seek assurance of compliance with religious and quality standards.

Innovation in logistics and the adoption of technologies like RFID are critical in improving efficiency and ensuring the authenticity of halal products throughout the supply chain.

Keywords like halal requirements, halal standards, and Islam form a cluster centred around compliance with religious and regulatory standards. This cluster underscores the necessity of adhering to specific guidelines to maintain the integrity of halal products. As halal markets expand globally, ensuring consistent compliance across different regions poses significant challenges, making this area a critical focus for researchers and practitioners.

Market and Consumer Dynamics cluster is represented by keywords such as halal market, halal industry, willingness to pay and halal cosmetics, indicating a focus on market trends and consumer preferences. Understanding consumer behaviour and market dynamics is crucial for developing strategies that align with evolving demands. The presence of terms related to willingness to pay highlights the economic aspects of consumer decision-making and the value placed on halal certification in different product categories, including cosmetics.

The visualization also reveals emerging areas of interest within the halal supply chain literature. The inclusion of blockchain-related terms suggests an emerging interest in using blockchain technology to enhance traceability and transparency. This area holds promise for addressing challenges related to authenticity, fraud prevention, and consumer trust, making it a fertile ground for future research.

Keywords like sustainable performance measures and optimization indicate a growing emphasis on sustainability and efficiency. As sustainability becomes increasingly important in global supply chains, research can explore how halal supply chains can balance religious compliance with environmental responsibility, adopting practices that minimize waste and reduce environmental impact.

Terms such as economic growth and competitive advantage highlight the economic implications and competitive strategies associated with halal supply chains. Researchers can investigate how halal certification and compliance contribute to competitive differentiation and market access, offering insights into the economic benefits of investing in halal supply chains.

In conclusion, by analyzing the co-occurrence of keywords, we can identify the central areas of focus and potential directions for future research. As the halal supply chain continues to evolve, addressing technological, market, and sustainability challenges will be critical to ensuring its growth and success. This analysis highlights the interdisciplinary nature of halal supply chain research and the importance of collaboration across fields to address complex and dynamic challenges. By building on the insights gained from this analysis, researchers and practitioners can contribute to the advancement of knowledge and practice in the halal supply chain domain.

What are co-authorship countries' collaborations?

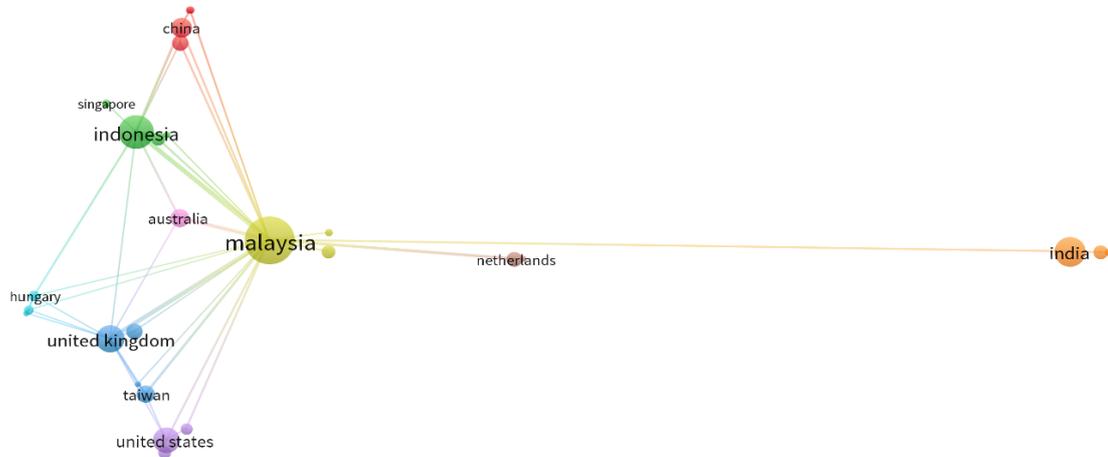


Figure 5: The Interconnectedness of Countries in the Sphere of the Halal Supply Chain Through Co-Authorship Ties

The provided VOSviewer figure illustrates the network of international collaborations based on co-authorship in the context of halal supply chain research. Each node represents a country, and the links between them indicate co-authorship relationships. The size of the nodes and the thickness of the links reflect the volume and strength of these collaborations, respectively.

The visualization prominently highlights Malaysia as the central hub for co-authorship collaborations in halal supply chain research as shown in Figure 5. Malaysia's prominence is unsurprising given its leadership role in the global halal industry and its commitment to advancing halal standards and practices. The country's strategic position in Southeast Asia and its active involvement in halal research make it an attractive partner for international collaboration.

Other key collaboration hubs include Indonesia and India, each demonstrating significant connections with Malaysia. These countries' strong collaborations reflect shared cultural and religious affinities and their mutual interest in advancing halal supply chain practices. The visualization suggests that Malaysia, Indonesia, and India form a triad of collaboration, highlighting the regional emphasis on halal research.

The network visualization reveals several interesting collaborative patterns and connections. The line connecting Malaysia and India is notably long, indicating a strong and perhaps specialized collaborative relationship between researchers in these countries. This collaboration likely focuses on areas of shared interest and expertise, such as enhancing halal certification processes, addressing supply chain challenges, and exploring innovative solutions for halal product distribution.

Malaysia's connections with Indonesia and Singapore suggest active collaboration within the Southeast Asian region. These collaborations reflect shared interests in halal logistics,

regulatory compliance, and market development. The proximity of these countries facilitates collaboration, enabling researchers to address regional challenges and opportunities effectively. The visualization also highlights Malaysia's collaborations with countries outside Southeast Asia, including the United Kingdom, the United States, Australia, and the Netherlands. These connections suggest a broader interest in leveraging international expertise to address complex issues in halal supply chains. Collaborations with Western countries may focus on integrating advanced technologies, enhancing traceability, and exploring global market trends.

The analysis of co-authorship countries' collaborations in halal supply chain research reveals a dynamic and interconnected network of partnerships that transcend geographical boundaries. Malaysia's central role as a hub for collaboration reflects its leadership in the halal industry and its commitment to advancing research and innovation. The diverse range of collaborations underscores the importance of international cooperation in addressing complex challenges and opportunities within the halal supply chain domain. As the field continues to evolve, fostering and expanding these collaborative networks will be essential for driving progress and ensuring the sustainable growth of halal supply chains worldwide.

What is co-citation by the cited author?

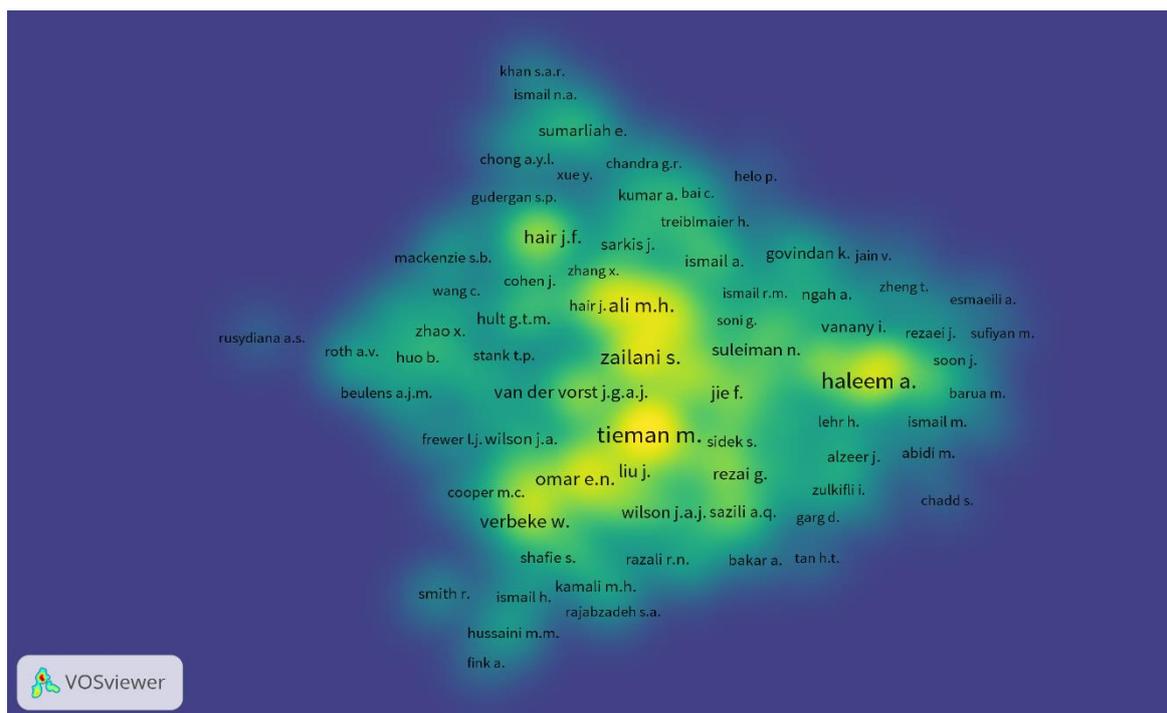


Figure 6: The Co-Citation Trends Among Writers in the Domain of the Halal Supply Chain

Figure 6 above illustrates a co-citation network by VOSviewer, which maps the relationships between authors based on how frequently they are cited together in academic literature. The nodes represent authors, and the links indicate the frequency of co-citation, with larger nodes and thicker links denoting higher co-citation frequencies. The colour gradient from blue to yellow represents the density of co-citations, with yellow areas indicating higher concentrations.

Prominent authors like Tieman, M. is a highly cited author, reflecting a central role in halal supply chain research. Zailani, S. also frequently cited, highlighting influential work in this domain. Haleem, A. noteworthy for frequent citations, indicating impactful research contributions. Ali, M.H. also significantly cited, pointing to substantial influence on the field. Hair, J.F. and Hair, J.F. also showed highly prominent nodes, indicating frequent co-citation and suggesting their significant contributions to the field.

Authors are grouped into clusters based on co-citation patterns, indicating thematic or methodological similarities in their research. Cluster 1 (Yellow/Green) includes central figures like Hair, J.F., Tieman, M., Zailani, S., and Haleem, A., suggesting their works are often cited together and form a core body of literature. Cluster 2 (Green/Blue) contains authors like Wilson, A.J.A., and Verbeke, W., indicating another prominent cluster of co-citation, possibly focusing on different but related aspects of the halal supply chain. Cluster 3 (Blue) comprises less frequently cited authors, forming peripheral but interconnected research contributions.

Core Contributors or the central cluster, including Hair, J.F., Tieman, M., and Zailani, S., suggest a core group of researchers whose works are foundational and frequently referenced together. This indicates that their research addresses key concepts, methodologies, or findings that are integral to the field of halal supply chains.

The presence of multiple clusters indicates diverse research interests and specializations within halal supply chain studies. Each cluster may represent different research themes, such as logistics, food safety, religious compliance, or economic impact. The network demonstrates a well-connected knowledge base, with frequent cross-referencing among authors. This interconnectedness facilitates the development of a cohesive understanding of halal supply chain dynamics and challenges. Authors like Haleem, A., and Ali, M.H. being frequently co-cited with core contributors suggests that their research is influential and often builds upon or complements the foundational work of others in the field.

The co-citation analysis by the cited author provides valuable insights into the intellectual structure of halal supply chain research. It highlights the central role of key contributors and the thematic clusters that shape the field. Understanding these co-citation patterns helps identify influential works, discern research trends, and guide future studies towards addressing existing gaps and building upon established knowledge. This interconnected network of authors fosters a collaborative and comprehensive approach to advancing the halal supply chain.

Conclusions

The extensive Scopus analytics data on the halal supply chain from 2008 to 2023 highlights a significant academic interest, indicating the substantial expansion and development of the industry in the actual world. The surge in scholarly focus, characterized by substantial growth in publications, underscores the dynamic and diverse nature of the discipline. The presence of various authors, including prominent personalities such as Marco Tieman, Abid Haleem and Suhaiza Zailani indicates a diverse and multi-faceted discussion. Furthermore, the pie chart demonstrates the complex combination of knowledge domains necessary for comprehending the halal supply chain, spanning business management, computer science disciplines and decision sciences. The VOSviewer visualizations provide additional insights into the worldwide collaboration and influence of this research, highlighting the numerous multinational collaborations involved. The subject of halal supply chain research is constantly changing in reaction to technological improvements and more demand in the halal industry globally. This

demonstrates the importance and influential role of this field in determining future halal strategies and regulations.

Marco Tieman's 2011 paper "The Application of Halal in Supply Chain Management: In-depth Interviews" received the most worldwide and local citations, with 206. The co-citation study shows that Marco Tieman's 2011 and 2013 research has a network nearly connected to all nodes in co-citation clusters, demonstrating strong influence and relevance in the field.

These bibliometric findings indicate a significant divide in the literature concerning the role of technology in Halal supply chains. While some scholars advocate for traditional methods, others emphasize the need for technological advancements like blockchain. This study contributes to resolving this theoretical controversy by demonstrating, through bibliometric trends, how digital innovations are increasingly being recognized as essential for maintaining supply chain integrity. Additionally, it contributes to the study of halal supply chain management in practice and can help researchers as well as practitioners comprehend the current state of HSCM research and propose new areas for future research.

References

- Ab Talib, M. S., Hamid, A. B. A., & Zulfakar, M. H. (2015). Halal Supply Chain Critical Success Factors: A Literature Review. *Journal of Islamic Marketing*, 6(1), 44–71. <https://doi.org/10.1108/JIMA-07-2013-0049>
- Afraz, S. M., Gillani, H., Bin, A., Senin, A., & Bode, J. (2022). Bibliometric Analysis of Digital Entrepreneurial Education and Student Intention ; Reviewed and Analyzed by VOSViewer from Google Scholar. *International Journals of Interactive Mobile Technologies*, 16(13), 48–65.
- Ali, M.H., Chung, L., Kumar, A., Zailani, S., & Tan, K. H. (2021). A Sustainable Blockchain Framework for the Halal Food Supply Chain: Lessons from Malaysia. *Technological Forecasting and Social Change*, 170. <https://doi.org/10.1016/j.techfore.2021.120870>
- Ali, Mohd Helmi, & Suleiman, N. (2018). Eleven Shades Of Food Integrity: A Halal Supply Chain Perspective. *Trends in Food Science and Technology*, 71(April 2017), 216–224. <https://doi.org/10.1016/j.tifs.2017.11.016>
- Ali, Mohd Helmi, Tan, K. H., & Ismail, M. D. (2017). A Supply Chain Integrity Framework for Halal Food. *British Food Journal*, 119(1), 20–38. <https://doi.org/10.1108/BFJ-07-2016-0345>
- Azmi, F. R., Abdullah, A., Bakri, M. H., Musa, H., & Jayakrishnan, M. (2018). The Adoption of Halal Food Supply Chain Towards the Performance of Food Manufacturing in Malaysia. *Management Science Letters*, 8(7), 755–766. <https://doi.org/10.5267/j.msl.2018.5.010>
- Bayu, A., Nandiyanto, D., Fitria, D. W. I., & Husaeni, A. L. (2022). *Bibliometric Analysis Of Engineering Research Using Vosviewer Indexed By Google Scholar*. 17(2), 883–894.
- Bonne, K., & Verbeke, W. (2008). Religious values Inform Halal Meat Production and The Control and Delivery Of Halal Credence Quality. *Agriculture and Human Values*, 25(1), 35–47. <https://doi.org/10.1007/s10460-007-9076-y>
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct A Bibliometric Analysis: An Overview and Guidelines. *Journal of Business Research*, 133(April), 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- Eck, N. J. Van, & Waltman, L. (2019). *VOSviewer Manual* (Issue September).
- Firdiansyah, F. A., Rosidi, A., & Nur Iman, A. K. (2021). Implementation of Green Halal Supply Chain Management in Halal Supply Chain Management- A Conceptual Model. *ISLAMICONOMIC: Jurnal Ekonomi Islam*, 12(1), 1–22.

- <https://doi.org/10.32678/ijeiv12i1.257>
- Hew, J.-J., Wong, L.-W., Tan, G. W.-H., Ooi, K.-B., & Lin, B. (2020). The blockchain-based Halal Traceability Systems: A Hype Or Reality? *Supply Chain Management*, 25(6), 863–879. <https://doi.org/10.1108/SCM-01-2020-0044>
- Indarti, N., & Lukito-budi, A. S. (2020). *A systematic review of halal supply chain research : to where shall we go ?* <https://doi.org/10.1108/JIMA-05-2020-0161>
- Iranmanesh, M., Senali, M. G., Ghobakhloo, M., Nikbin, D., & Abbasi, G. A. (2021). *Customer behaviour towards halal food : A systematic review and agenda for future research.*
- Khan, S., Haleem, A., Khan, M. I., Abidi, M. H., & Al-Ahmari, A. (2018). Implementing traceability systems in specific supply chain management (SCM) through critical success factors (CSFs). *Sustainability (Switzerland)*, 10(1). <https://doi.org/10.3390/su10010204>
- Masudin, I., Rahmatullah, B. B., Agung, M. A., Dewanti, I. A., & Restuputri, D. P. (2022). Traceability System in Halal Procurement: A Bibliometric Review. *Logistics*, 6(4). <https://doi.org/10.3390/logistics6040067>
- Moral-muñoz, J. A., Herrera-viedma, E., Santisteban-espejo, A., Cobo, M. J., Herrera-viedma, E., Santisteban-espejo, A., & Cobo, M. J. (2020). *Software tools for conducting bibliometric analysis in science : An up-to-date review.* 1–20.
- Muhammad, A., Zainuddin, A., & Suzana, H. (2016). Issues and Challenges in Retail Food Supply Chain from the Perspective of Halal Logistics: A Literature Review. *J. Appl. Environ. Biol. Sci*, 6(9S), 8–13. www.textroad.com
- Naeem, S., Ayyub, R. M., Ishaq, I., Sadiq, S., & Mahmood, T. (2019). Systematic literature review of halal food consumption-qualitative research era 1990-2017. *Journal of Islamic Marketing, ahead-of-p*(ahead-of-print). <https://doi.org/10.1108/JIMA-09-2018-0163>
- Padrós-Cuxart, R., Riera-Quintero, C., & March-Mir, F. (2016). Bibliometrics: A publication analysis tool. *CEUR Workshop Proceedings*, 1567, 44–53.
- Soon, J. M., Chandia, M., & Regenstein, J. Mac. (2017). Halal integrity in the food supply chain. *British Food Journal*, 119(1), 39–51. <https://doi.org/10.1108/BFJ-04-2016-0150>
- Sukati, I., & Bawaain, A. (2019). The Practices of Halal Foods and Beverages Supply Chain on Marketing Performance: A Conceptual Framework. *International Journal of Business and Social Science*, 10(8), 110–117. <https://doi.org/10.30845/ijbss.v10n8p13>
- Tieman, M. (2011). The application of Halal in supply chain management: In-depth interviews. *Journal of Islamic Marketing*, 2(2), 186–195. <https://doi.org/10.1108/17590831111139893>
- Tieman, M., van der Vorst, J. G. A. J., & Ghazali, M. C. (2012). Principles in halal supply chain management. *Journal of Islamic Marketing*, 3(3), 217–243. <https://doi.org/10.1108/17590831211259727>
- Zailani, S., Iranmanesh, M., Aziz, A. A., & Kanapathy, K. (2017). Halal logistics opportunities and challenges. *Journal of Islamic Marketing*, 8(1), 127–139. <https://doi.org/10.1108/JIMA-04-2015-0028>