



Global Halal Certification Research: Trends, Intellectual Structure, and Future Research Directions

Suja'i^{1*}, Ma'zumi², Amalia Salsabila³

¹Islamic Economics Department, Faculty of Economics and Business, Universitas Sultan Ageng Tirtayasa, Serang, Indonesia

²Accounting Department, Faculty of Economics and Business, Universitas Sultan Ageng Tirtayasa, Serang, Indonesia

³ Magister of Sharia Economics, Postgraduate Program, Islamic State Sultan Maulana Hasanuddin University, Serang, Indonesia

Article Info

Article history:

Received May 30, 2026
Revised June 12, 2026
Accepted June 30, 2026

Keywords:

Halal certification
Bibliometric analysis
Science mapping
Halal governance
Digital transformation.

ABSTRACT

The rapid growth of the global halal economy has increased scholarly interest in halal certification, yet its intellectual development and emerging research directions remain fragmented. This study aims to systematically map the evolution of global halal certification research by identifying publication trends, leading contributors, thematic development, and future research opportunities. A bibliometric approach was employed using 473 publications retrieved from the Scopus database through a structured document selection process. The data were analyzed using Bibliometrix and Biblioshiny in RStudio to examine scientific productivity, influential sources, authors, institutions, countries, and thematic evolution. The findings reveal a significant increase in research output, with Indonesia and Malaysia emerging as the leading contributors. The field has evolved from focusing on religious compliance and consumer assurance toward broader themes related to governance, supply chain management, digital transformation, sustainability, and business competitiveness. The originality of this study lies in proposing an evolutionary framework that explains the intellectual progression of halal certification research while identifying emerging research opportunities. These findings provide valuable insights for researchers, policymakers, certification authorities, and industry practitioners in strengthening a more transparent, innovative, and sustainable global halal ecosystem.

This is an open access article under the [CC-BY](#) 4.0. license.



Corresponding Author:

*Suja'i

Islamic Economics Department, Faculty of Islamic Economics and Business,
Universitas Sultan Ageng Tirtayasa

Jl. Raya Palka Km 3 Sindangsari, Pabuaran,
Kab. Serang Provinsi Banten, Indonesia

Email: sujaisaleh111@untirta.ac.id

1. INTRODUCTION

The global halal industry has evolved into one of the fastest-growing sectors of the international economy, driven by the increasing demand for products and services that comply with Islamic principles while meeting global standards of quality, safety, and sustainability. Initially associated primarily with food products, the halal industry has expanded substantially to encompass cosmetics, pharmaceuticals, healthcare, logistics, tourism, finance, fashion, and digital services (Al-Teinaz & Al-Mazeedi, 2020). This expansion reflects not only the growth of the global Muslim population but also increasing recognition among non-Muslim consumers who perceive halal-certified products as indicators of hygiene, ethical production, and quality assurance (Hassan et al., 2016; Mohd Salleh et al., 2026). Consequently, halal certification has evolved beyond its traditional religious function to become a strategic governance mechanism that enhances consumer confidence, facilitates international trade, and strengthens the competitiveness of halal products in global markets.

The strategic importance of halal certification has become increasingly evident as governments, international organizations, and industry stakeholders seek to strengthen the integrity of global halal value chains. Halal certification provides formal assurance that products, production processes, and supply chains comply with Shariah principles while simultaneously satisfying regulatory requirements and market expectations (Fauziah et al., 2026). Beyond ensuring religious compliance, certification functions as an institutional instrument for improving product traceability, reducing information asymmetry, protecting consumers, and promoting sustainable business practices (Razak et al., 2026)(Razak et al., 2026). These multiple functions have positioned halal certification at the intersection of Islamic economics, international trade, supply chain management, food science, marketing, public policy, and digital innovation, making it one of the most dynamic research areas within the broader halal ecosystem (Rejeb et al., 2025).

Despite its remarkable development, the global halal certification landscape remains fragmented due to differences in regulatory frameworks, certification authorities, and interpretations of Islamic jurisprudence across countries. More than sixty countries have established halal certification systems, yet the absence of universally recognized standards continues to create administrative complexity, duplicate certification procedures, and increase compliance costs for producers engaged in international trade

(Fauziah et al., 2026). Comparative studies demonstrate substantial differences between Malaysia's centralized certification model administered by JAKIM, Indonesia's decentralized framework under BPJPH, Singapore's MUIS system, and certification arrangements implemented across Gulf Cooperation Council (GCC) countries (Zhang et al., 2026). These regulatory differences frequently create uncertainty for businesses, complicate market access, and reduce the efficiency of cross-border halal trade, highlighting the need for greater harmonization through international initiatives such as ASEAN, SMIC, and ISO/IEC standards (Johan & Plana-Casado, 2023; Khan & Khan, 2019).

The rapid advancement of digital technologies has introduced new opportunities for improving halal certification systems while simultaneously creating new research challenges. Emerging technologies including blockchain, artificial intelligence (AI), the Internet of Things (IoT), digital twins, smart contracts, and near-field communication (NFC) have increasingly been adopted to enhance product traceability, automate certification processes, prevent fraudulent certification practices, and improve supply chain transparency (Ellahi et al., 2026; Matusin, 2026). Digital transformation has therefore shifted halal certification from a predominantly administrative process toward an integrated digital governance system capable of supporting real-time monitoring and verification across increasingly complex global supply chains (Heikal et al., 2024). Nevertheless, technological adoption remains uneven, particularly among small and medium-sized enterprises (SMEs), where financial constraints, limited digital literacy, inadequate technological infrastructure, and regulatory uncertainty continue to hinder the effective implementation of digital halal certification systems (Fathoni et al., 2025).

Consumer trust has become another fundamental dimension in halal certification research. Numerous empirical studies demonstrate that halal certification significantly influences consumers' purchase intentions by strengthening perceptions of product quality, safety, authenticity, and regulatory compliance (Fatmawati & Islam, 2025). Among Muslim consumers, certification serves as an important assurance that products conform to Islamic dietary and ethical principles, whereas non-Muslim consumers increasingly associate halal labels with hygiene, food safety, and ethical manufacturing practices (Abdou et al., 2024; Barrion et al., 2022). Moreover, religiosity consistently moderates the relationship between halal awareness and purchasing behavior by shaping consumer attitudes, subjective norms, and trust toward certified products (Koc et al., 2024). These findings demonstrate that halal certification has evolved beyond a religious symbol into a multidimensional quality assurance mechanism capable of enhancing market competitiveness across both Muslim-majority and non-Muslim-majority countries.

While halal certification offers considerable economic and social benefits, its implementation continues to face substantial institutional and operational challenges. Small and medium-sized enterprises (SMEs), which constitute the backbone of many halal industries, frequently encounter

financial constraints, complex certification procedures, limited technical expertise, and inadequate digital capabilities when applying for halal certification (Fathoni et al., 2025). In addition, weak inter-agency coordination, inconsistent regulatory enforcement, and limited technological infrastructure reduce the effectiveness and credibility of certification systems in several countries (Muhammad et al., 2020). The increasing incidence of counterfeit halal logos, expired certificates, and weak monitoring mechanisms further undermines consumer confidence and highlights the importance of integrating digital technologies into certification governance (Agung et al., 2024; Tieman et al., 2019). Consequently, strengthening institutional governance, simplifying certification procedures, and accelerating digital transformation have become strategic priorities for improving the effectiveness and global competitiveness of halal certification systems.

Recognizing these challenges, scholars have increasingly investigated halal certification from diverse disciplinary perspectives. Previous studies have explored regulatory harmonization among certification authorities (Johan & Plana-Casado, 2023), governance and standardization of halal certification frameworks (Fauziah et al., 2026), blockchain-enabled traceability and digital assurance systems (Heikal & Rachman, 2024), consumer trust and purchase intention (Koc et al., 2024), halal certification adoption among SMEs (Fianto et al., 2025), and technological innovations supporting halal supply chain integrity (Ellahi et al., 2026). Other studies have examined halal certification within specific sectors, including food, cosmetics, pharmaceuticals, logistics, and tourism, reflecting the increasingly interdisciplinary nature of halal certification research. Collectively, these studies have enriched scholarly understanding of halal certification from regulatory, technological, managerial, and consumer perspectives.

Despite these contributions, the existing literature remains fragmented in several respects. First, most studies concentrate on specific sectors—particularly halal food—while comparatively limited attention has been devoted to emerging industries such as cosmetics, pharmaceuticals, healthcare, tourism, media, and digital services, despite their rapidly growing market potential (Has-Yun Hashim et al., 2022; Nazaruddin et al., 2023). Second, research has largely examined isolated dimensions of halal certification, including consumer behavior, regulatory compliance, supply chain management, or technological adoption, with relatively few studies integrating these perspectives into a comprehensive understanding of the field. Third, although digital technologies such as blockchain, artificial intelligence, the Internet of Things, and digital twins are increasingly discussed as transformative tools for halal certification, empirical evidence regarding their intellectual development and research evolution remains limited (Rejeb et al., 2025). These limitations indicate that the current body of knowledge has yet to provide a holistic understanding of how halal certification research has evolved across disciplines, countries, institutions, and technological domains.

Furthermore, existing review studies primarily emphasize the broader halal industry rather than halal certification itself. Hashim et al. (2022)

mapped the evolution of halal research between 1996 and 2020, while Nazaruddin et al. (2023) focused on halal food additives and ingredients from economic and business perspectives. Rejeb et al. (2025) applied topic modeling to halal food research, providing valuable insights into thematic development within the food sector. Although these studies contribute significantly to halal literature, none specifically examines the global intellectual structure, collaboration patterns, thematic evolution, and emerging research frontiers of halal certification as a distinct field of scientific inquiry. As halal certification increasingly functions as a global governance mechanism influencing trade, consumer protection, digital innovation, and sustainable development, a dedicated bibliometric investigation becomes both timely and necessary.

The limitations identified in previous studies reveal an important opportunity to advance halal certification research through a comprehensive bibliometric perspective. Bibliometric analysis enables researchers to systematically examine the evolution of scientific knowledge by identifying publication trends, influential authors, collaborative networks, thematic developments, and emerging research frontiers. Unlike narrative or systematic literature reviews, bibliometric approaches provide quantitative evidence regarding the intellectual structure of a research field and reveal hidden relationships among authors, institutions, countries, journals, and research themes (Donthu et al., 2021). Such evidence is particularly valuable for rapidly evolving multidisciplinary fields such as halal certification, where research has expanded across Islamic studies, food science, business management, digital technology, supply chain management, and public policy. Despite the growing body of literature, a comprehensive bibliometric investigation dedicated specifically to global halal certification research remains limited, leaving significant gaps in understanding the field's scientific evolution and future trajectory.

This study addresses these limitations by providing a comprehensive mapping of global halal certification research rather than examining isolated aspects of the halal industry. The novelty of this study lies in the integration of bibliometric performance analysis and science mapping techniques to simultaneously investigate publication growth, influential journals, leading authors, institutional and international collaborations, intellectual structure, thematic evolution, and emerging research opportunities within halal certification research. In contrast to previous bibliometric studies that focused on halal research in general or specific sectors such as halal food, this study positions halal certification as an independent and multidisciplinary research domain, thereby offering a more comprehensive understanding of its scientific development and identifying future research agendas that remain underexplored. This integrative perspective contributes to extending existing knowledge on halal governance, certification systems, digital transformation, and sustainable halal ecosystems.

The urgency of this study arises from the increasingly strategic role of halal certification in supporting global trade, consumer protection, regulatory harmonization, and digital transformation within the halal industry. As

research output continues to expand across multiple disciplines, a fragmented body of knowledge may hinder the identification of emerging themes, collaborative opportunities, and evidence-based policy directions. A comprehensive bibliometric assessment is therefore essential to consolidate existing knowledge, identify research priorities, and provide a clearer understanding of the intellectual landscape of halal certification research. The findings are expected to support researchers in developing future research agendas, assist policymakers and halal certification authorities in formulating evidence-based strategies, and help industry stakeholders anticipate emerging trends that will shape the future development of the global halal industry.

Therefore, this study aims to analyze the global development of halal certification research through a bibliometric approach using the Scopus database. Specifically, the study identifies publication trends, leading sources, influential authors, institutional and international collaboration networks, intellectual structures, thematic evolution, and emerging research topics. Furthermore, the study proposes future research directions to support the advancement of halal certification scholarship and contribute to strengthening sustainable, transparent, and globally competitive halal certification systems.

2. METHOD

This study employed a bibliometric approach to systematically investigate the scientific development of global halal certification research. Bibliometric analysis is widely recognized as a rigorous quantitative approach for evaluating scientific productivity, identifying influential publications, examining collaboration patterns, and mapping the intellectual structure of a research field through bibliographic metadata (Donthu et al., 2021). Compared with conventional literature reviews, bibliometric analysis provides a more objective, transparent, and reproducible assessment of scientific knowledge by integrating performance analysis with science mapping techniques (Zupic & Čater, 2015). This approach is particularly appropriate for halal certification research because the topic has developed into a multidisciplinary field encompassing Islamic economics, business and management, food science, supply chain management, public policy, and digital technology.

The bibliographic data were retrieved exclusively from the Scopus database, which is recognized as one of the largest multidisciplinary citation databases and is widely employed in bibliometric studies because of its standardized metadata, extensive journal coverage, and high indexing quality (Baas et al., 2020). Data collection was conducted in May 2026 using the following Boolean search query applied to the Title, Abstract, and Keywords fields:

TITLE-ABS-KEY ("halal certification" OR "halal certif" OR "halal assurance" OR "halal standard" OR "halal compliance" OR "halal accreditation" OR "halal logo" OR "halal label")

To ensure transparency and reproducibility, the document selection process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Page et al., 2021). As illustrated in Figure 1, the initial search identified 1,188 records from the Scopus database. No duplicate records were identified during the identification stage. The screening process subsequently applied predefined inclusion criteria by limiting the dataset to publications within the subject areas of Social Sciences; Business, Management and Accounting; and Economics, Econometrics and Finance, while restricting the document type to final published journal articles. These criteria reduced the dataset to 493 screened records, whereas 695 records were excluded because they did not satisfy the predefined inclusion criteria. During the eligibility assessment, publications classified as articles in press or non-English documents were excluded (n = 20). Following the complete PRISMA selection process, a final dataset of 473 publications was retained for subsequent bibliometric analysis.

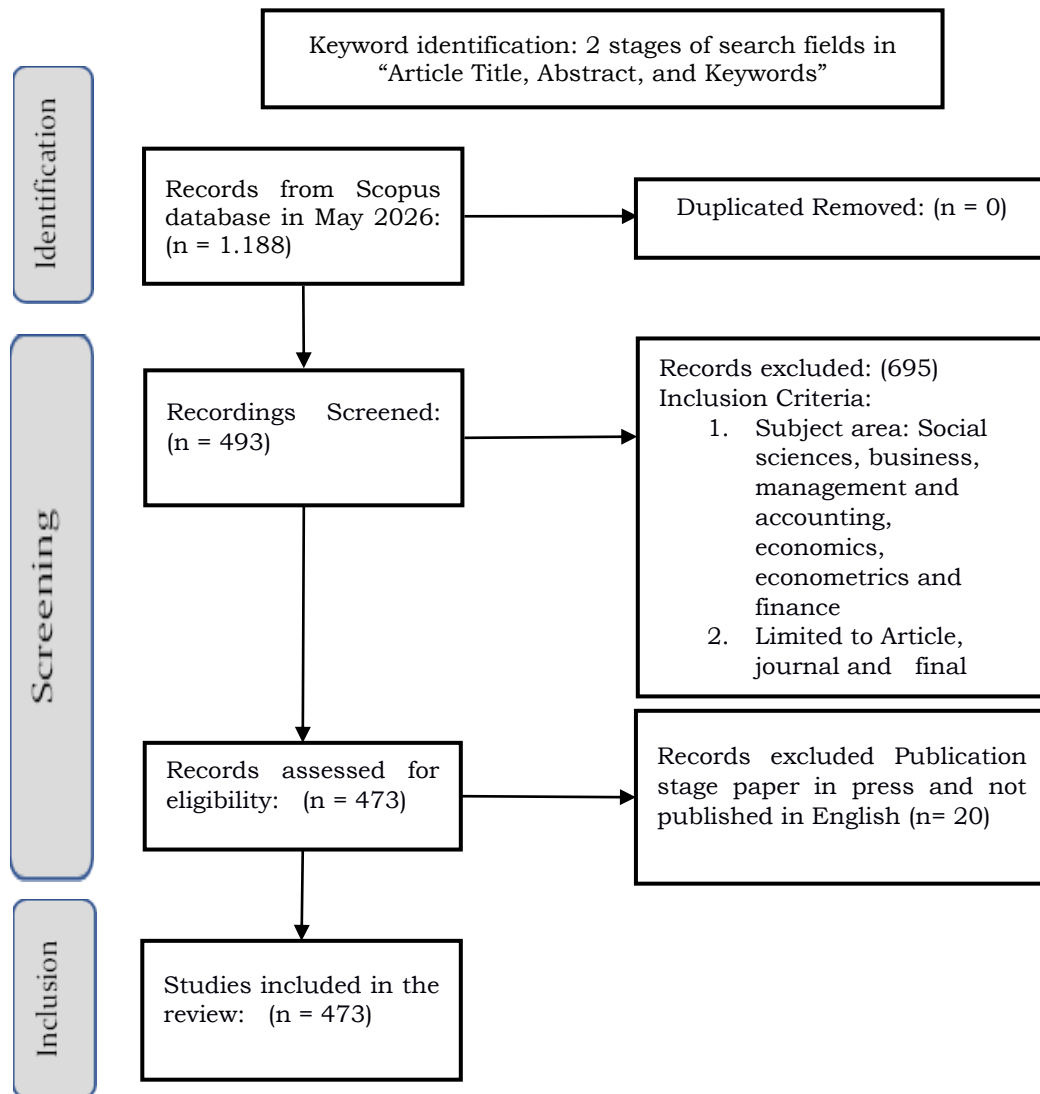


Figure 1. The PRISMA 2020 Flow Chart

The selected bibliographic records were exported in BibTeX format and analyzed using RStudio (Version 4.x) with the Bibliometrix package and its graphical web interface, Biblioshiny (Jain & Goyal, 2024). Bibliometrix provides an integrated computational environment for conducting descriptive bibliometric analysis, network visualization, and science mapping within a reproducible analytical workflow. Compared with stand-alone visualization software, Bibliometrix enables comprehensive data preprocessing, statistical analysis, thematic exploration, and graphical visualization within a single platform, thereby improving analytical consistency and reproducibility.

The bibliometric analysis was conducted in two complementary stages. The first stage consisted of performance analysis, which evaluated annual scientific production, source productivity, author productivity, institutional

productivity, country scientific production, citation performance, and collaboration patterns to describe the scientific development of halal certification research. The second stage employed science mapping analysis to investigate the intellectual and conceptual structure of the field through keyword co-occurrence analysis, trend topic analysis, thematic mapping, thematic evolution, conceptual structure analysis using Multiple Correspondence Analysis (MCA), collaboration network analysis, and historiographic mapping. These complementary analytical procedures enabled the identification of dominant research themes, influential contributors, emerging research topics, and evolving knowledge structures within the global halal certification literature.

To enhance analytical transparency, several bibliometric parameters were predefined before analysis. Annual scientific production was calculated based on publication year. Source, author, institution, and country productivity were ranked according to the total number of indexed documents. Citation analysis employed total citation counts extracted from the Scopus database. Science mapping analyses were conducted using author keywords with full counting, while thematic evolution and trend topic analyses were generated through Bibliometrix using minimum frequency thresholds to identify dominant and emerging research themes. Network visualizations were standardized to improve comparability across collaboration and conceptual analyses.

By integrating the PRISMA 2020 document selection framework with Bibliometrix-based performance analysis and science mapping, this study provides a comprehensive and transparent overview of the evolution of halal certification research from both quantitative and conceptual perspectives. This integrated methodological framework not only captures publication productivity and collaboration patterns but also reveals thematic evolution, intellectual development, and emerging research frontiers, thereby providing a robust evidence base for researchers, policymakers, certification authorities, and industry practitioners seeking to strengthen halal governance and support the sustainable development of the global halal ecosystem.

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1 Annual Scientific Production

Figure 1 illustrates the annual scientific production of global halal certification research from 2010 to 2026. The publication trend demonstrates a consistent upward trajectory, reflecting the increasing scholarly attention devoted to halal certification as an emerging multidisciplinary research domain. During the early period (2010–2016), publication output remained relatively low, indicating that halal certification was still a developing area of scientific inquiry. Research productivity increased steadily after 2017 and accelerated markedly from 2022 onward, coinciding with growing global

demand for halal-certified products, expanding regulatory frameworks, and the adoption of digital technologies to improve halal assurance and supply chain transparency. The highest publication output was recorded in 2025, suggesting that halal certification has become an increasingly important topic within Islamic economics, supply chain management, food science, digital governance, and international trade. The lower number of publications in 2026 should be interpreted cautiously, as the bibliographic data were collected before the completion of the publication year and therefore do not represent the final annual publication output.

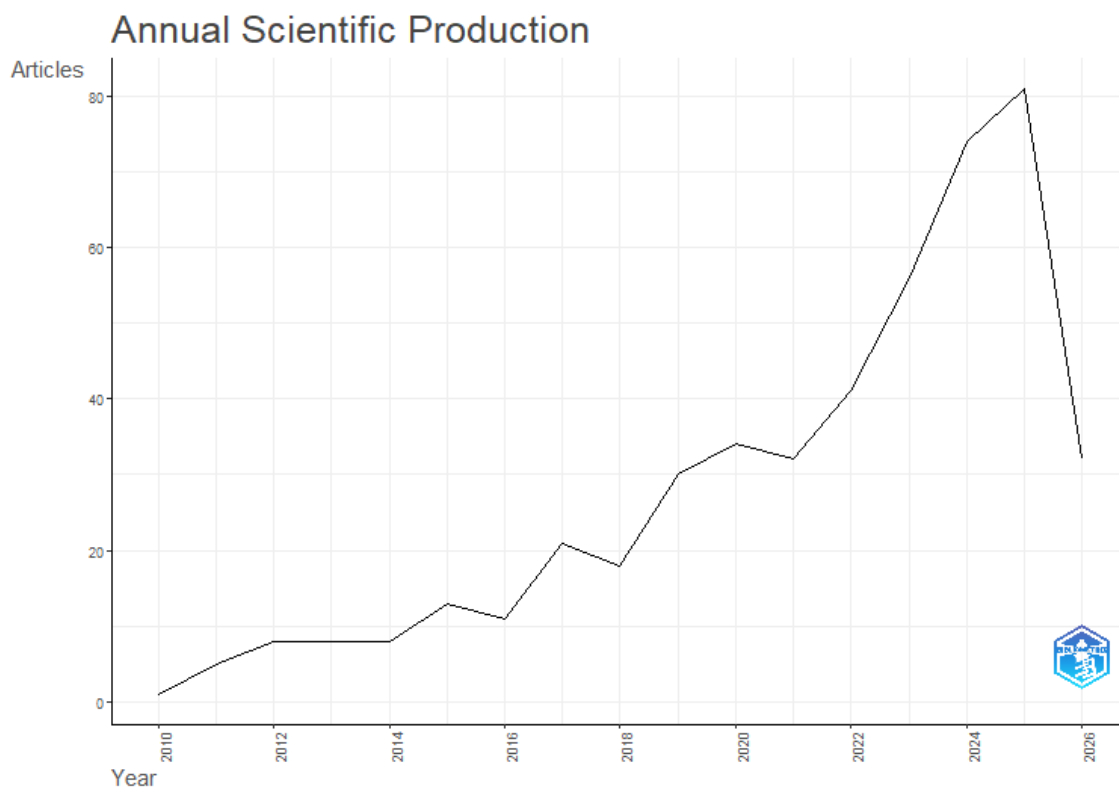


Figure 1. Annual Scientific Production of Global Halal Certification Research (2010–2026)

Source: Authors' analysis using the Bibliometrix package (Biblioshiny) in RStudio based on the Scopus database (2026).

This publication pattern indicates that halal certification has gradually shifted from a niche topic within Islamic jurisprudence toward a strategic multidisciplinary research domain. The acceleration after 2022 coincides with stronger governmental commitment to halal regulation, increasing international recognition of halal certification as a trade facilitation instrument, and the rapid integration of digital technologies into halal assurance systems. Rather than representing merely quantitative growth, this trend illustrates the institutionalization of halal certification research within

broader discussions of sustainability, governance, digital transformation, and global value chains.

3.1.2 Most Relevant Publication Sources

Figure 2 presents the ten most relevant publication sources contributing to global halal certification research. The *Journal of Islamic Marketing* is the most influential publication outlet, publishing 102 articles, far exceeding other journals. This finding highlights the journal's central role as the primary platform for disseminating research on halal certification, Islamic marketing, consumer behavior, and halal business management. The *International Journal of Supply Chain Management* ranks second with 26 articles, reflecting the growing importance of halal supply chain integrity, traceability, and logistics within halal certification studies. Other notable sources include the *Global Journal Al-Thaqafah* (16 articles), *Malaysian Journal of Consumer and Family Economics* (10 articles), and *Journal of Islamic Economic Laws* (9 articles), demonstrating that halal certification research spans multiple disciplines, including Islamic economics, law, consumer studies, and management. The diversity of publication outlets indicates that halal certification has evolved into an interdisciplinary research domain that integrates religious compliance, governance, business management, supply chain systems, and consumer protection. At the same time, the clear dominance of the *Journal of Islamic Marketing* suggests that marketing and consumer-oriented perspectives continue to shape the intellectual development of halal certification research.

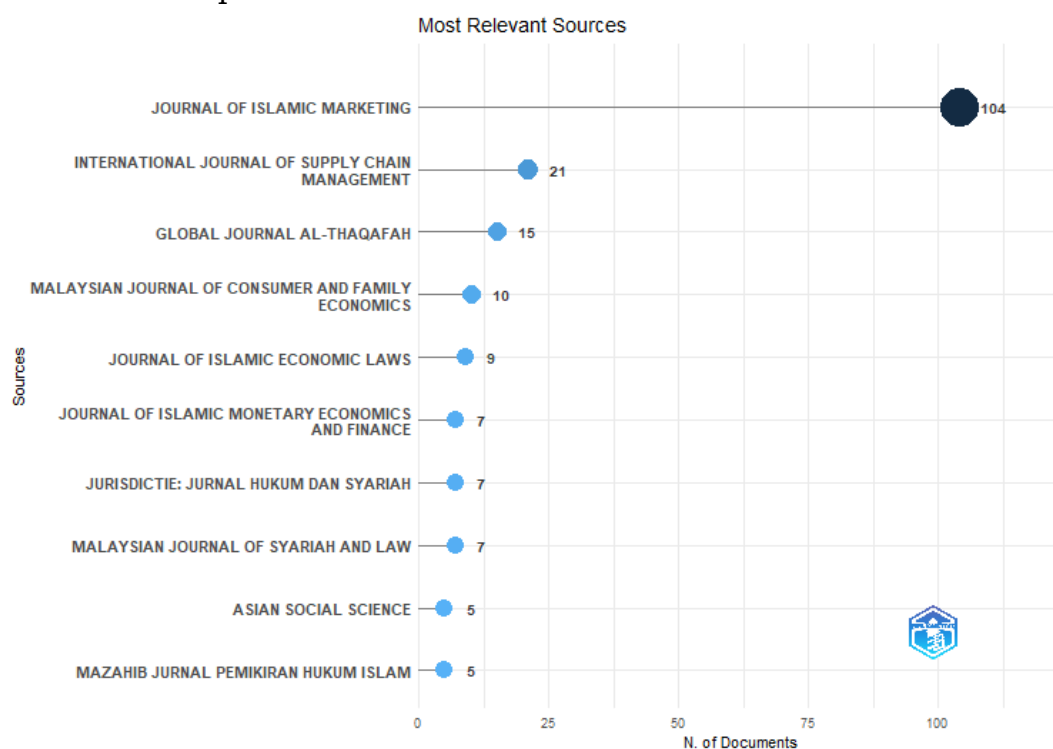


Figure 2. Most Relevant Sources in Global Halal Certification Research
Source: Authors' analysis using the Bibliometrix package (Biblioshiny)
in RStudio based on the Scopus database (2026).

The dominance of the Journal of Islamic Marketing also suggests that scholarly attention increasingly approaches halal certification from market-oriented and strategic management perspectives rather than purely theological discussions. This shift reflects the commercialization of the halal ecosystem, where certification functions as a mechanism for competitive advantage, consumer trust, and international market access.

3.1.3 Most Productive Authors

Figure 3 presents the ten most productive authors in global halal certification research based on the number of publications. Ab Talib, M. S. and Islam, M. M. emerged as the most prolific contributors, each publishing six documents, indicating their sustained scholarly engagement and leadership in advancing halal certification research. They are followed by Azizah, S. N., Rachmania, Tieman, M., and Zakaria, Z., each contributing five publications, while Alam, A., Halim, M. A., Ismail, R. M., and Khan, M. T. each produced four publications. The distribution of publication productivity suggests that halal certification research is driven by a relatively small group of highly active scholars who have consistently contributed to the development of knowledge in this field. These leading authors have explored diverse research themes, including halal supply chain management, certification governance, consumer trust, regulatory harmonization, digital traceability, and sustainable halal ecosystems. Their continuous scholarly contributions have played a significant role in shaping the intellectual development of halal certification research and fostering interdisciplinary collaboration across business, Islamic economics, food science, and supply chain management. The concentration of publications among a limited number of productive researchers also indicates the presence of a developing core research community that continues to expand the scientific foundation of global halal certification studies.

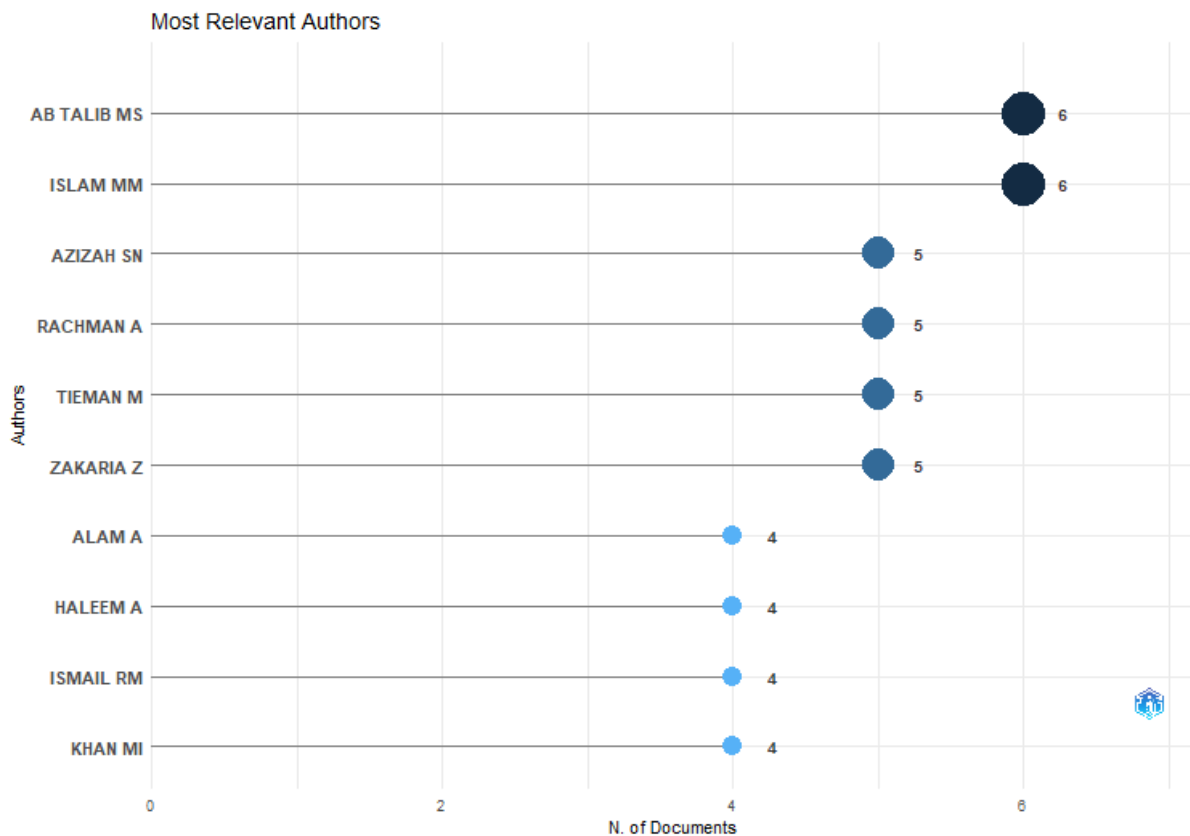


Figure 3. Most Productive Authors in Global Halal Certification Research

Source: Authors' analysis using the Bibliometrix package (Biblioshiny) in RStudio based on the Scopus database (2026).

3.1.4 Most Productive Universities

Figure 4 presents the ten most productive universities contributing to global halal certification research. Universiti Teknologi MARA (UiTM), Malaysia, ranks first with 30 publications, followed by Universiti Utara Malaysia (27 publications), while Universiti Kebangsaan Malaysia and Universiti Putra Malaysia each contributed 20 publications. Other prominent institutions include Universitas Airlangga and Universiti Sains Islam Malaysia (17 publications each), International Islamic University Malaysia (14 publications), Universiti Teknologi Malaysia (13 publications), IPB University (11 publications), and Universiti Sultan Zainal Abidin (10 publications). The dominance of Malaysian universities highlights Malaysia's leadership in halal certification research, reflecting its well-established halal governance system, internationally recognized certification framework led by the Department of Islamic Development Malaysia (JAKIM), and strong institutional commitment to halal science and industry development. Meanwhile, the presence of leading Indonesian universities, particularly Universitas Airlangga and IPB

University, demonstrates Indonesia's increasing research capacity in halal certification following regulatory reforms and the expansion of the national halal ecosystem. Overall, the distribution of productive universities indicates that halal certification research is concentrated in institutions located within countries possessing mature halal industries, comprehensive regulatory frameworks, and active collaboration among academia, government, and industry. These universities have become important knowledge hubs that drive scientific innovation and contribute to the advancement of global halal certification research.

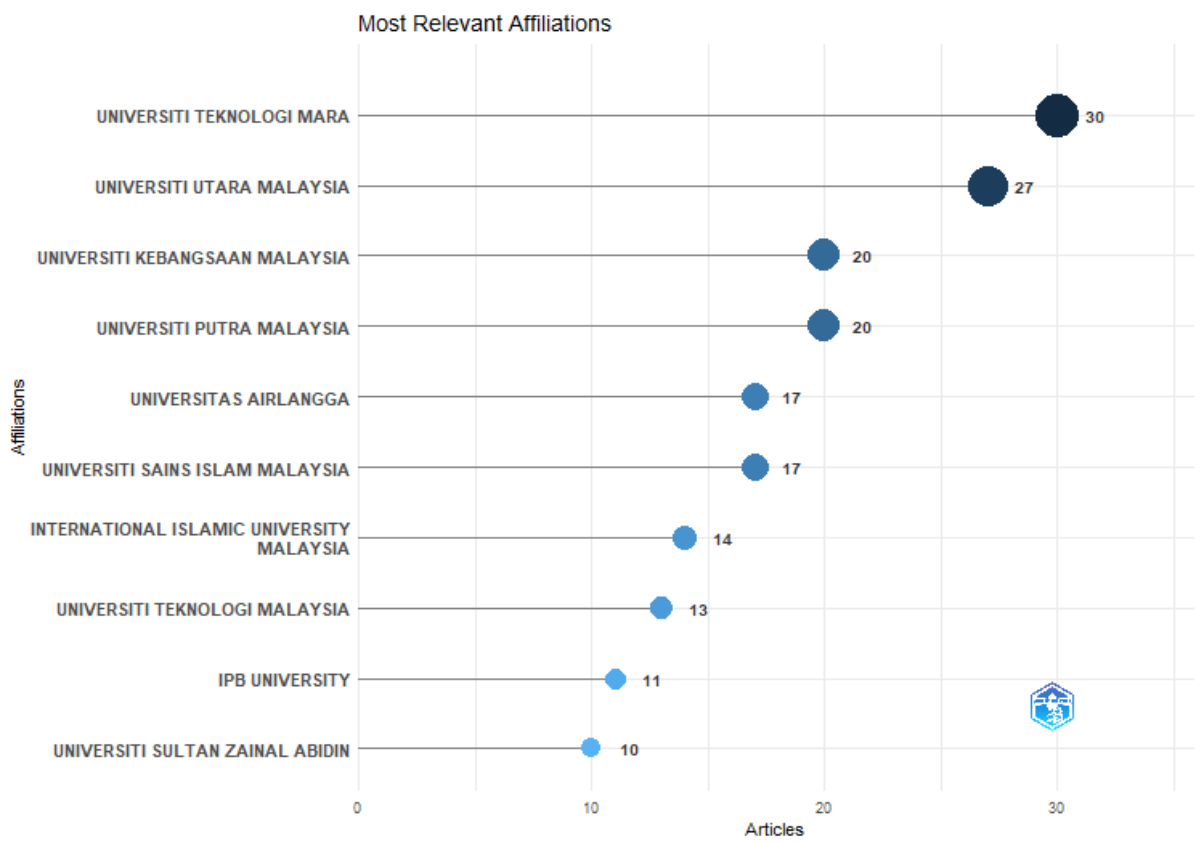


Figure 4. Most Productive Universities in Global Halal Certification Research

Source: Authors' analysis using the Bibliometrix package (Biblioshiny) in RStudio based on the Scopus database (2026).

3.1.5 Country Scientific Production

Table 1 presents the ten most productive countries in global halal certification research, highlighting the clear dominance of Indonesia and Malaysia, which contributed 429 and 317 publications, respectively. This finding indicates that Southeast Asia has become the global center of halal certification scholarship, supported by comprehensive halal governance systems, well-established certification institutions, expanding halal industries, and strong governmental commitment to halal ecosystem

development. Indonesia's leading position reflects the rapid growth of research following the implementation of the Halal Product Assurance Law and the establishment of the Halal Product Assurance Organizing Agency (BPJPH), while Malaysia's productivity is reinforced by its internationally recognized halal certification framework under the Department of Islamic Development Malaysia (JAKIM). In contrast, other countries, including India (22 publications), China (19), Thailand (18), the United Kingdom (18), Turkey (15), Japan (14), South Korea (13), and Australia (12), contribute at a considerably lower level, suggesting that halal certification research remains concentrated in countries with mature halal industries and regulatory infrastructures. Nevertheless, the participation of both Muslim-majority and non-Muslim-majority countries demonstrates that halal certification has evolved into a globally relevant and multidisciplinary research field, extending beyond religious compliance to encompass international trade, supply chain management, consumer protection, and sustainable economic development.

Table 1. Top Ten Countries Contributing to Global Halal Certification Research

Rank	Country	Number of Publications
1	Indonesia	429
2	Malaysia	317
3	India	22
4	China	19
5	Thailand	18
6	United Kingdom	18
7	Turkey	15
8	Japan	14
9	South Korea	13
10	Australia	12

Source: Authors' analysis using the Bibliometrix package (Biblioshiny) in RStudio based on the Scopus database (2026).

The geographical concentration of scientific production in Southeast Asia reflects the strategic positioning of Indonesia and Malaysia as global leaders in Islamic business development. Their regulatory innovations have transformed halal certification from a domestic compliance mechanism into an internationally recognized governance instrument supporting halal trade, investment, and sustainable industrial development. Consequently, scientific productivity appears closely associated with the maturity of national halal ecosystems and institutional support for Islamic economic development.

3.2.6 Trend Topics

Figure 5 illustrates the thematic evolution of global halal certification research by identifying the emergence and temporal development of frequently discussed topics. During the early period (2012–2016), research primarily focused on foundational themes such as restaurant, Islam, JAKIM, Muslim consumers, consumer behaviour, religion, and halal logistics, reflecting initial scholarly attention to religious compliance, consumer perceptions, and institutional aspects of halal certification. Between 2018 and 2022, the research landscape expanded considerably with the emergence of topics including halal standard, halal market, Malaysia, awareness, halal logo, Islamic marketing, certification, halal food, halal industry, and halal supply chain, indicating a shift toward governance, branding, consumer trust, and supply chain management. More recently, from 2023 to 2025, new themes such as purchase intention, religiosity, financial performance, Islamic law, and MSMEs have gained increasing prominence, suggesting that halal certification research is evolving beyond regulatory compliance toward broader discussions on business performance, legal frameworks, organizational sustainability, and consumer decision-making. The continued prominence of halal certification throughout the observation period confirms its role as the central research theme, while the emergence of more diverse topics demonstrates the growing interdisciplinarity of the field and highlights promising opportunities for future research integrating digital transformation, sustainability, governance, and innovation within the global halal ecosystem.

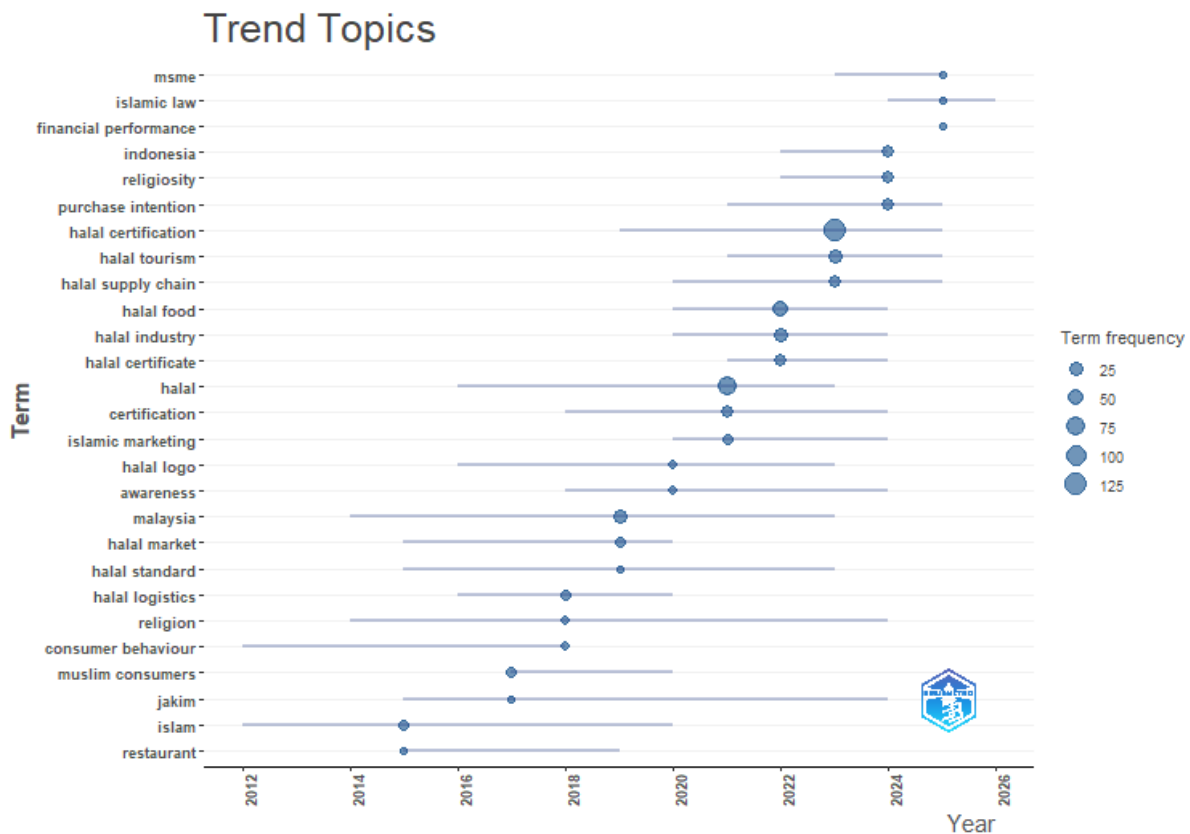


Figure 5. Trend Topics in Global Halal Certification Research (2012–2025)
Source: Authors' analysis using the Bibliometrix package (Biblioshiny) in RStudio based on the Scopus database (2026).

3.2 Discussions

The findings of this study demonstrate that halal certification research has experienced substantial growth over the past decade, reflecting the increasing strategic importance of halal certification within the global halal ecosystem. The upward trajectory of scientific publications indicates that halal certification is no longer perceived solely as a mechanism for ensuring compliance with Islamic dietary laws but has evolved into a multidisciplinary research field encompassing governance, international trade, consumer behavior, digital innovation, sustainability, and supply chain management. This evolution corresponds with the rapid expansion of the global halal economy, which has transformed halal certification into a strategic instrument for enhancing market competitiveness, strengthening consumer confidence, and facilitating international trade (Fauziah et al., 2026; Mohd Salleh et al., 2026; Rejeb et al., 2025). Similar observations have been reported by Razak et al. (2026), who argue that halal certification increasingly functions as a comprehensive quality assurance system that integrates religious values with contemporary business and regulatory practices.

The steady increase in publication output also reflects the growing complexity of issues surrounding halal certification. Earlier studies predominantly focused on consumer awareness, halal logos, religious

observance, and institutional legitimacy, whereas contemporary research increasingly investigates certification governance, regulatory harmonization, halal supply chain management, digital traceability, and sustainable industrial development. This transition illustrates a broader paradigm shift in which halal certification is viewed as an institutional governance mechanism rather than merely an administrative certification procedure. According to Johan and Plana-Casado (2023), differences in certification standards and regulatory frameworks among countries remain one of the principal barriers to international halal trade, reinforcing the importance of harmonized certification systems. Likewise, Tieman (2017) emphasized that effective halal assurance requires integrated governance involving certification agencies, governments, industries, and consumers to ensure transparency and credibility throughout the halal supply chain.

Another important finding concerns the concentration of scientific publications within the *Journal of Islamic Marketing*, which emerged as the leading publication outlet in this study. This dominance reflects the gradual transformation of halal certification research from a predominantly legal and religious discourse toward a broader business and marketing perspective. Previous studies have consistently demonstrated that halal certification significantly influences brand trust, perceived product quality, purchase intention, and customer loyalty across diverse consumer segments (Abdou et al., 2024; Koc et al., 2024). Consequently, halal certification is increasingly positioned as a strategic marketing resource capable of reducing information asymmetry and strengthening competitive advantage in global markets. The prominence of marketing-oriented journals therefore indicates that researchers increasingly recognize halal certification as an integral component of value creation, branding strategies, and relationship marketing within the expanding halal economy.

The bibliometric results also reveal the emergence of a relatively small but highly productive community of scholars who have continuously contributed to the advancement of halal certification research. Such a pattern is characteristic of developing scientific domains, where a limited number of influential researchers initially establish conceptual foundations before attracting broader international participation (Donthu et al., 2021). The leading authors identified in this study have consistently explored interconnected topics, including halal supply chain management, certification governance, consumer trust, institutional harmonization, and digital transformation. Their sustained scholarly contributions have facilitated the integration of perspectives from Islamic economics, business management, food science, logistics, and information systems, thereby accelerating the interdisciplinary development of halal certification research. As highlighted by Zupic and Čater (2015), the emergence of core research communities plays an essential role in shaping the intellectual structure and long-term evolution of scientific disciplines.

The institutional distribution of publications further demonstrates that scientific leadership in halal certification research is concentrated within Southeast Asia, particularly Malaysia and Indonesia. Malaysian universities

dominate scientific production, reflecting the country's long-standing commitment to developing a comprehensive halal ecosystem supported by robust public policies, internationally recognized certification standards, and extensive investment in halal research and innovation. The global reputation of the Department of Islamic Development Malaysia (JAKIM) has positioned Malaysia as a benchmark for halal governance, encouraging universities to strengthen research on certification systems, halal supply chains, Islamic marketing, and industrial competitiveness (Azam & Abdullah, 2020). Meanwhile, the increasing contribution of Indonesian universities reflects the significant impact of regulatory reforms following the enactment of the Halal Product Assurance Law and the establishment of the Halal Product Assurance Organizing Agency (BPJPH). These institutional developments have stimulated growing academic interest in halal governance, certification management, and the expansion of Indonesia's halal industry, thereby reinforcing the country's position as an emerging global center for halal research.

The geographical distribution of scientific production confirms this regional leadership. Indonesia and Malaysia account for the overwhelming majority of publications, substantially exceeding contributions from India, China, Thailand, the United Kingdom, Turkey, Japan, South Korea, and Australia. Although demographic characteristics contribute to this dominance, the findings suggest that research productivity is more strongly associated with institutional maturity, regulatory commitment, government investment, and collaboration between academia and industry. Countries with comprehensive halal certification systems appear to provide more favorable environments for scientific development, innovation, and knowledge dissemination. Nevertheless, the increasing participation of non-Muslim-majority countries demonstrates that halal certification has become an internationally relevant research topic extending beyond religious studies to include international trade, consumer protection, food safety, sustainability, and digital governance. This observation supports the argument of Bonne and Verbeke (2008) that halal certification increasingly serves as a global quality assurance mechanism capable of enhancing market access and strengthening consumer confidence across diverse cultural contexts.

The thematic evolution identified in this study demonstrates that halal certification research has undergone a clear intellectual transition from a predominantly religion-oriented perspective toward a broader multidisciplinary research agenda. During the early stage of its development, scholarly attention was largely directed toward issues of religious compliance, consumer awareness, restaurant management, halal logos, and institutional actors such as the Department of Islamic Development Malaysia (JAKIM). This emphasis reflected the primary concern of ensuring that halal-certified products complied with Islamic principles while simultaneously strengthening consumer confidence in halal assurance systems. Early empirical studies similarly emphasized that consumers perceived halal certification primarily as an indicator of religious legitimacy and product authenticity, particularly within Muslim-majority countries (Bonne &

Verbeke, 2008; Wilson & Liu, 2010). Consequently, research during this period was dominated by discussions concerning certification procedures, religious obligations, and the role of certification bodies in maintaining the integrity of halal products.

As the global halal economy expanded, the intellectual orientation of halal certification research gradually shifted toward governance and industrial development. The emergence of themes such as halal standards, halal supply chains, halal markets, certification, Islamic marketing, and halal industry reflects increasing recognition that halal certification has become an essential component of industrial competitiveness rather than merely a religious requirement. This transition corresponds with the rapid internationalization of halal markets, where certification serves as a prerequisite for market access, export competitiveness, and consumer protection across international supply chains (Tieman, 2017; Khan et al., 2019). The growing complexity of global production networks has also encouraged researchers to investigate institutional harmonization, regulatory consistency, and certification governance, particularly in response to differences among national halal standards that continue to challenge international trade (Johan & Plana-Casado, 2023). Consequently, halal certification has increasingly been examined through the perspectives of strategic management, logistics, governance, and international business, illustrating its evolution into a comprehensive quality assurance system.

More recent research themes reveal another significant transformation characterized by the integration of business performance, organizational capability, and consumer behavior into halal certification studies. The increasing prominence of topics such as purchase intention, religiosity, financial performance, Islamic law, and micro, small, and medium enterprises (MSMEs) suggests that scholars are no longer concerned solely with the implementation of certification procedures but also with understanding their broader organizational and economic implications. Recent studies consistently demonstrate that halal certification contributes positively to firm competitiveness, brand reputation, export performance, and consumer loyalty while simultaneously strengthening organizational legitimacy in increasingly competitive global markets (Abdou et al., 2024; Koc et al., 2024). Likewise, growing attention to MSMEs reflects recognition that small businesses represent the backbone of the halal industry yet continue to face significant barriers in obtaining certification, including financial constraints, administrative complexity, limited technical expertise, and inadequate digital capabilities (Fianto et al., 2025). These findings indicate that future research should increasingly address mechanisms for improving certification accessibility and institutional support for small enterprises operating within the halal economy.

Another important observation emerging from this study is the gradual convergence between halal certification and digital transformation. Although digital technologies do not yet dominate the keyword landscape, recent publications increasingly discuss blockchain, artificial intelligence, Internet of Things (IoT), digital traceability, and smart certification systems as

emerging research directions. This trend reflects the growing recognition that conventional certification systems are no longer sufficient to address the complexity of global halal supply chains, where transparency, traceability, and real-time verification have become essential requirements for maintaining consumer trust and regulatory compliance (Heikal et al., 2024; Ellahi et al., 2026). Blockchain technology, for example, has been widely recognized as a promising solution for enhancing the transparency and security of halal supply chains by enabling immutable digital records throughout production and distribution processes. Similarly, artificial intelligence and IoT technologies are increasingly employed to automate inspection procedures, monitor supply chain activities, and strengthen the efficiency of halal assurance systems (Matusin et al., 2026). These developments indicate that halal certification research is entering a new stage characterized by the convergence of Islamic governance principles with digital innovation and Industry 4.0 technologies.

Taken together, these thematic developments suggest that global halal certification research has evolved through three interconnected phases. The first phase focused on religious compliance and consumer assurance, emphasizing halal legitimacy, certification procedures, and consumer awareness. The second phase expanded toward institutional governance and industrial integration, where research increasingly examined regulatory harmonization, supply chain management, certification governance, and international competitiveness. The third and current phase is characterized by digital transformation and sustainable halal ecosystems, in which halal certification is increasingly viewed as a strategic governance mechanism integrating technological innovation, sustainability, organizational resilience, and global value chain management. This conceptual evolution demonstrates that halal certification has matured from a specialized religious issue into a multidisciplinary scientific field capable of contributing to broader discussions concerning governance, digital innovation, sustainable development, and international business. Accordingly, future scholarship should move beyond sector-specific investigations toward more integrative studies that examine the interaction among regulatory frameworks, digital technologies, organizational capabilities, consumer trust, and sustainability within the evolving global halal ecosystem.

3.3 Future Research Directions: Toward Digital, Sustainable, and Globally Harmonized Halal Certification

The bibliometric findings indicate that halal certification research is entering a new stage characterized by increasing interdisciplinarity and technological integration. Although existing studies have substantially contributed to understanding consumer behavior, halal food, certification governance, and supply chain management, several emerging research areas remain underexplored. Future research should therefore move beyond conventional discussions of certification compliance toward more comprehensive investigations of how digital technologies, sustainability principles, and global governance interact to reshape halal certification

systems. In particular, the growing interest in blockchain, artificial intelligence (AI), the Internet of Things (IoT), big data analytics, and digital traceability suggests that digital transformation will become one of the most influential drivers of future halal certification research. These technologies offer significant opportunities to improve transparency, automate certification processes, enhance real-time monitoring, reduce fraudulent practices, and strengthen consumer confidence through more secure and efficient halal assurance systems (Ellahi et al., 2026; Heikal et al., 2024).

Another promising research direction concerns the integration of halal certification with sustainability and Environmental, Social, and Governance (ESG) principles. While previous studies have predominantly examined halal certification from religious, legal, and commercial perspectives, relatively limited attention has been devoted to its contribution to sustainable production, circular economy practices, green supply chain management, climate resilience, and responsible consumption. As global markets increasingly demand products that are not only halal but also environmentally and socially responsible, future studies should investigate how halal certification can support broader sustainability agendas, including the Sustainable Development Goals (SDGs). Integrating halal governance with sustainability frameworks would provide a more holistic understanding of halal certification as both a religious obligation and a mechanism for promoting ethical, inclusive, and sustainable economic development.

The findings also reveal significant opportunities for comparative and cross-country research. The dominance of Indonesia and Malaysia demonstrates the maturity of halal research ecosystems in Southeast Asia; however, scientific contributions from Africa, the Middle East, Europe, and the Americas remain comparatively limited. Future studies should therefore undertake comparative analyses of halal certification policies, regulatory governance, institutional effectiveness, and mutual recognition systems across different legal, cultural, and economic contexts. Such comparative research would contribute to identifying best practices, reducing regulatory fragmentation, and supporting the harmonization of international halal certification standards. Greater collaboration among universities, certification bodies, governments, and international organizations will also be essential for strengthening the global knowledge base and facilitating evidence-based policy development.

Another area requiring greater scholarly attention is the role of halal certification in supporting innovation and business competitiveness among micro, small, and medium-sized enterprises (MSMEs). Although MSMEs constitute a substantial proportion of halal industry actors, many continue to face barriers related to certification costs, administrative complexity, limited technical capacity, and digital readiness. Future research should therefore explore institutional support mechanisms, digital certification platforms, financial incentives, and capacity-building programs that improve certification accessibility while enhancing business resilience and export competitiveness. Furthermore, longitudinal studies examining the long-term economic impact of halal certification on organizational performance,

innovation capability, international market expansion, and consumer trust would provide stronger empirical evidence for policymakers and industry practitioners.

Finally, future halal certification research should adopt more diverse methodological approaches. Existing studies are largely dominated by quantitative surveys and descriptive analyses, whereas mixed-methods research, longitudinal investigations, comparative case studies, social network analysis, machine learning, text mining, and predictive analytics remain relatively underutilized. Combining bibliometric analysis with systematic literature reviews, meta-analysis, or qualitative comparative approaches would enable researchers to generate deeper theoretical insights while improving methodological rigor. Such interdisciplinary and methodologically diverse research will not only enrich the intellectual development of halal certification studies but also strengthen their practical relevance in addressing the increasingly complex challenges of global halal governance, digital transformation, and sustainable industrial development.

4. CONCLUSION

This study systematically examined the development of global halal certification research through a bibliometric approach, revealing the evolution of the field from a narrowly focused discussion on religious compliance toward a broader multidisciplinary domain encompassing governance, supply chain management, consumer behavior, digital transformation, and sustainable development. By mapping publication trends, leading scientific contributors, institutional productivity, geographical distribution, and thematic evolution, the study provides a comprehensive understanding of the intellectual structure of halal certification research. The findings demonstrate that halal certification has become an increasingly strategic area of scientific inquiry, reflecting its expanding role in supporting global trade, strengthening consumer confidence, and enhancing institutional governance within the global halal ecosystem. Furthermore, the proposed evolutionary framework contributes to a deeper conceptual understanding of how halal certification research has progressed from religious compliance and consumer assurance to institutional governance and industrial integration, and more recently toward digital transformation and sustainable halal ecosystems.

This study contributes theoretically by extending the existing halal certification literature through a comprehensive bibliometric mapping that integrates performance analysis and science mapping to reveal the intellectual development and emerging research frontiers of the field. Methodologically, the study demonstrates the value of bibliometric analysis as a systematic approach for synthesizing multidisciplinary knowledge and identifying future research trajectories. Practically, the findings provide valuable insights for researchers, certification authorities, industry practitioners, and policymakers in strengthening research collaboration, improving halal certification governance, promoting regulatory harmonization, and accelerating the adoption of digital technologies to

develop more transparent, efficient, and internationally recognized halal certification systems.

Despite these contributions, this study has several limitations. First, the analysis was based exclusively on publications indexed in the Scopus database, which may not fully capture relevant studies published in other international databases or regional indexing systems. Second, the findings are limited by the search strategy and selected keywords, which may have excluded studies discussing halal certification using different terminologies. Third, as a bibliometric study, the analysis primarily emphasizes publication metadata and scientific relationships rather than evaluating the substantive quality or empirical findings of individual studies. These limitations should be considered when interpreting the scope and generalizability of the results.

Future research is encouraged to expand the bibliographic coverage by incorporating multiple databases such as Web of Science and Dimensions, while employing more comprehensive search strategies to capture the evolving landscape of halal certification research. Combining bibliometric techniques with systematic literature reviews, meta-analysis, or qualitative evidence synthesis may provide richer theoretical insights and a deeper understanding of emerging issues. Future studies should also explore underrepresented themes, including digital halal certification, blockchain-enabled traceability, artificial intelligence, sustainability, ESG integration, and comparative analyses of halal governance across different countries. Such efforts will further advance the theoretical development and practical implementation of halal certification in response to the growing complexity of the global halal economy.

ACKNOWLEDGEMENTS

The authors would like to express their sincere appreciation to all institutions and scholars whose published works have contributed to the development of this bibliometric study. The authors also acknowledge the support provided by the Scopus database, which served as the primary source of bibliographic data, and the Bibliometrix package in RStudio, which facilitated the bibliometric and science mapping analyses. Finally, the authors are grateful to the anonymous reviewers and editors for their valuable comments and constructive suggestions, which have significantly improved the quality of this manuscript.

REFERENCES

- Abdou, A. H., Chan, M. P., Rehman, S. U., Albakhit, A. I. A., & Almakhayitah, M. Y. (2024). Islamic food laws: customer satisfaction effect halal purchase intention in China. Moderating role of religiosity. *British Food Journal*, 126(8), 3088–3112. <https://doi.org/10.1108/BFJ-10-2023-0875>
- Agung, A. A. G., Yuniar, I., & Hendriyanto, R. (2024). Smart Contract and IPFS Decentralized Storage for Halal Certification Process. *International Journal on Informatics Visualization*, 8(1), 79–87.

- <https://doi.org/10.62527/joiv.8.1.1497>
- Al-Teinaz, Y. R., & Al-Mazeedi, H. M. M. (2020). Halal certification and international halal standards. In *The Halal Food Handbook* (pp. 227–251). Wiley Blackwell. <https://doi.org/10.1002/9781118823026.ch15>
- Barrion, A. S. A., Orillo, A. T. O., Nguyen-Orca, M. F. R., & Tandang, N. A. (2022). Knowledge and attitude of selected non-Muslim college students towards Halal-certified food products. *Food Research*, 6(6), 306–315. [https://doi.org/10.26656/fr.2017.6\(6\).869](https://doi.org/10.26656/fr.2017.6(6).869)
- 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>
- Ellahi, R. M., Wood, L. C., & Bekhit, A. E.-D. A. (2026). A multi-layer Industry 4.0 framework for ensuring halal integrity in NZ meat supply chains. *Food Control*, 182. <https://doi.org/10.1016/j.foodcont.2025.111880>
- Fathoni, M. A., Priyatno, P. D., Faizi, Wiryanto, F. S., Rachbini, W., & Suryani. (2025). Unlocking barriers and strategies of halal certification for micro and small enterprises in Indonesia: Analytic network process approach. *Problems and Perspectives in Management*, 23(1), 169–180. [https://doi.org/10.21511/ppm.23\(1\).2025.13](https://doi.org/10.21511/ppm.23(1).2025.13)
- Fatmawati, I., & Islam, M. M. (2025). Does Religiosity Moderate Halal Purchase Decisions? Examining the Role of Awareness, Certification, Marketing Mix Strategies, Social and Innovation. In *Implementing Halal Principles and Regulations in Business Governance* (pp. 263–292). IGI Global. <https://doi.org/10.4018/9798337339177.ch010>
- Fauziah, L., Windriya, A., & Mege, S. R. (2026). Harmonizing Global Standards for Halal Materials, Products, and Laboratory Certification. In *Governance of Halal Logistics and Supply Chains: Policies, Challenges and Best Practices* (pp. 52–66). Taylor and Francis. <https://doi.org/10.4324/9781003662761-5>
- Fianto, B. A., Fauzi, F. P., Suprayogi, N., Filianti, D., Gan, C., & Anisha, A. I. I. N. (2025). Factors influencing behavior intention to obtain halal certificate: study on MSMEs in Indonesia and Malaysia. *Journal of Islamic Marketing*. <https://doi.org/10.1108/JIMA-09-2024-0446>
- Has-Yun Hashim, Y. Z., Ahmad, A. N., Samsudin, N., Abd Lateef, M. H., & Majlan, N. S. (2022). THE EVOLUTION OF HALAL RESEARCH: A BIBLIOMETRIC FOR 1996 – 2020. *Journal of Fatwa Management and Research*, 27(3), 1–38. <https://doi.org/10.33102/jfatwa.vol27no3.443>
- Hassan, S. H., Dann, S., Kamal, K. A. M., & de Run, E. C. (2016). Influence of the halal certification mark in food product advertisements in Malaysia. In *New Cultures of Food Marketing Opportunities from Ethnic Religious and Cultural Diversity*.
- Heikal, M., & Rachman, A. (2024). Digitalization of Halal Food Supply Chain Management Based on Blockchain Technology. In F. J., P. M., K. T., T. H., B. M., & A. S. B. (Eds.), *Springer Proceedings in Business and Economics* (pp. 103–121). Springer Nature. https://doi.org/10.1007/978-981-97-5400-7_7

- Jain, M. A., & Goyal, N. (2024). Behavioural Finance: a Bibliometric Analysis Using Scopus Database. *Sachetas*, 3(1), 26–33. <https://doi.org/10.55955/310004>
- Johan, E., & Plana-Casado, M. J. (2023). Harmonizing Halal in ASEAN: Analysis of Halal Food Guidelines under the ASEAN Way Approach. *Journal of ASEAN Studies*, 11(1), 43–67. <https://doi.org/10.21512/jas.v11i1.9682>
- Khan, G., & Khan, F. (2019). Ascertaining the “Halalness” of restaurants – scale development and validation. *Journal of Islamic Marketing*, 10(2), 426–439. <https://doi.org/10.1108/JIMA-04-2018-0067>
- Koc, F., Ozkan, B., Komodromos, M., Efendioglu, I. H., & Baran, T. (2024). The effects of trust and religiosity on halal products purchase intention: indirect effect of attitude. *Euromed Journal of Business*, 20(5), 141–165. <https://doi.org/10.1108/EMJB-01-2024-0004>
- Matusin, S. N. I. (2026). Blockchain technology and halal supply chain transparency. In *Beyond Halal Exploring Dietary Preferences Novel Ingredients and Techniques*. <https://doi.org/10.1016/B978-0-443-30058-5.00007-9>
- Mohd Salleh, H., Azmi, N. A. N., & Mohd Noor, N. (2026). Halal certification and global market access. In *Beyond Halal: Exploring Dietary Preferences, Novel Ingredients and Techniques* (pp. 503–526). Elsevier. <https://doi.org/10.1016/B978-0-443-30058-5.00006-7>
- Muhammad, M. A., Elistina, A. B., & Ahmad, S. (2020). The challenges faced by halal certification authorities in managing the halal certification process in Malaysia. *Food Research*, 4, 170–178. [https://doi.org/10.26656/fr.2017.4\(S1\).S17](https://doi.org/10.26656/fr.2017.4(S1).S17)
- Nazaruddin, L. O., Gyenge, B., Fekete-Farkas, M., & Lakner, Z. (2023). The Future Direction of Halal Food Additive and Ingredient Research in Economics and Business: A Bibliometric Analysis. *Sustainability (Switzerland)*, 15(7). <https://doi.org/10.3390/su15075680>
- Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., Mcdonald, S., ... Mckenzie, J. E. (2021). PRISMA 2020 explanation and elaboration: Updated guidance and exemplars for reporting systematic reviews. *The BMJ*, 372. <https://doi.org/10.1136/bmj.n160>
- Razak, S., Syahabuddin, S., & Raking, J. (2026). Assessing social impact in halal business practices: a maslahah-oriented framework for sustainable development. *Journal of Islamic Marketing*, 17(3), 898–922. <https://doi.org/10.1108/JIMA-10-2024-0450>
- Rejeb, A., Rejeb, K., & Zrelli, I. (2025). Exploring the state-of-the-art of halal food research using latent Dirichlet allocation. *Discover Food*, 5(1). <https://doi.org/10.1007/s44187-025-00298-6>
- Tieman, M., Darun, M. R., Fernando, Y., & Ngah, A. B. (2019). Utilizing blockchain technology to enhance halal integrity: The perspectives of halal certification bodies. In X. Y. & Z. L.-J. (Eds.), *Lecture Notes in*

Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics): Vol. 11517 LNCS (pp. 119–128). Springer Verlag. https://doi.org/10.1007/978-3-030-23381-5_9

Zhang, B.-Z., Moon, J.-W., & Park, J.-M. (2026). Comparative Review of Halal Certification Frameworks for Poultry Meat in Malaysia, Singapore, and Indonesia. *Foods*, 15(4). <https://doi.org/10.3390/foods15040659>