THE EVOLUTION OF HALAL RESEARCH: A BIBLIOMETRIC FOR 1996 – 2020

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ABSTRACT

The purpose of this review was to examine the evolution of halal research across various sectors in the last two decades, identify research gaps, and explore future research directions. This study employed the Scopus database to identify articles with the term "halal" within the publication year of 1996 to 2020. Bibliometric and network analyses were performed on 1770 articles using VOSviewer software 1.6.13. Citation metrics were generated using Publish and Perish v7 software. Halal research themes encompassed different disciplines. Findings revealed that halal authentication was the largest cluster among a total of 10 clusters. Emerging research areas include halal cosmetics, halal food supply chains, and halal tourism. Islamic finance and banking were found to be relevant in the halal ecosystem. Untapped areas include modest fashion, halal media and recreation, halal curriculum, halal science, and interrelationship between halal practice and Islamic faith. Responding to the COVID-19 pandemic, technologies surrounding digitisation and the Internet of Things are foreseen to be re-emerging hot areas. This study covers comprehensive halal research topics, including banking and financial aspects. A summary of recent bibliometric studies on halal is included in the discussion. The study also accentuates the keyword analysis that has enabled the identification of mature, emerging, and untapped clusters of halal research. The evolution of halal research was mapped to the Islamic economic sectors of the Global Islamic Economy Report to provide cogent arguments on the halal research landscape.

Keywords: halal, emerging clusters, untapped areas, halal curriculum, halal science

1.   INTRODUCTION

Halal has become a universal concept with its inherent characteristics of cleanliness, hygiene, and wholesomeness imbued with elements of quality, safety, and sustainability. While the practical definitions have evolved to suit the modern-day

lifestyle, this faith-based overarching system is well-guarded and maintained, guided by the teachings of the Quran and Sunnah. In 2018, USD 254 billion worth of halal goods was traded. This figure is projected to reach USD 3.2 trillion by 2024 (Dinar Standard, 2019). This commensurate with the growing demand for halal products and services by both Muslims and non-Muslims. Halal-related research and scholarly publications have also seen an upward trend, signifying the effort to fuel the halal industry with new creative and innovative solutions to ensure its sustainability. Translational research and innovation in halal-related areas have also been suggested to contribute to the socioeconomic development of many countries. However, as halal encompasses a diverse area, there have been imbalances in research focusing on certain halal sub-sectors which lead to missing or untapped but important areas.

Therefore, the purpose of this review was to examine the evolution of halal research in the last two decades, identify research gaps, and explore potential future research directions. Among others, the review addressed the topics or themes of halal-related research, geographical atlas, authors, and articles that are influential in the field.

The authors adopted bibliometric methods and networks to examine 1770 peer-reviewed journal articles drawn from the Scopus database. Although there have been several bibliometric studies on halal, this study appears to be the first attempt to cover the comprehensive halal topics or themes, including the banking and financial aspects, of which the latter has thus far been excluded from the existing work. As this study seeks to identify research gaps while advancing the halal body of knowledge, a rigorous discussion on keyword analysis has been undertaken. The authors extended the literature critique by mapping the evolution of halal research to the Islamic economic sectors of the Global Islamic Economy Report to indicate opportunities and areas that require further research. The authors also included articles in Malay and Indonesian language in the analysis, taking advantage of the ability to comprehend the language as the mother tongue of the authors.

The remainder of this paper proceeds as follows. Section 2 reviews the literature with highlights of the recent bibliometric analysis on halal scopes; Section 3 describes the methods used; Section 4 presents the results and discussions of the bibliometric undertaken; finally, Section 5 concludes.

2.   LITERATURE REVIEW

The halal industry has gained tremendous momentum in growth in the last two decades. The halal industry started with the halal food sector but has now expanded to cover non-food and services. Figure 1 illustrates the non-exhaustive components of the contemporary halal industry which include food, pharmaceuticals, cosmetics, travel, media, and recreation. It is noteworthy that while Islamic finance and insurance

have gained foothold long before the halal industry and is a sector on its own, it is an integral component of the halal industry (Dinar Standard, 2020).
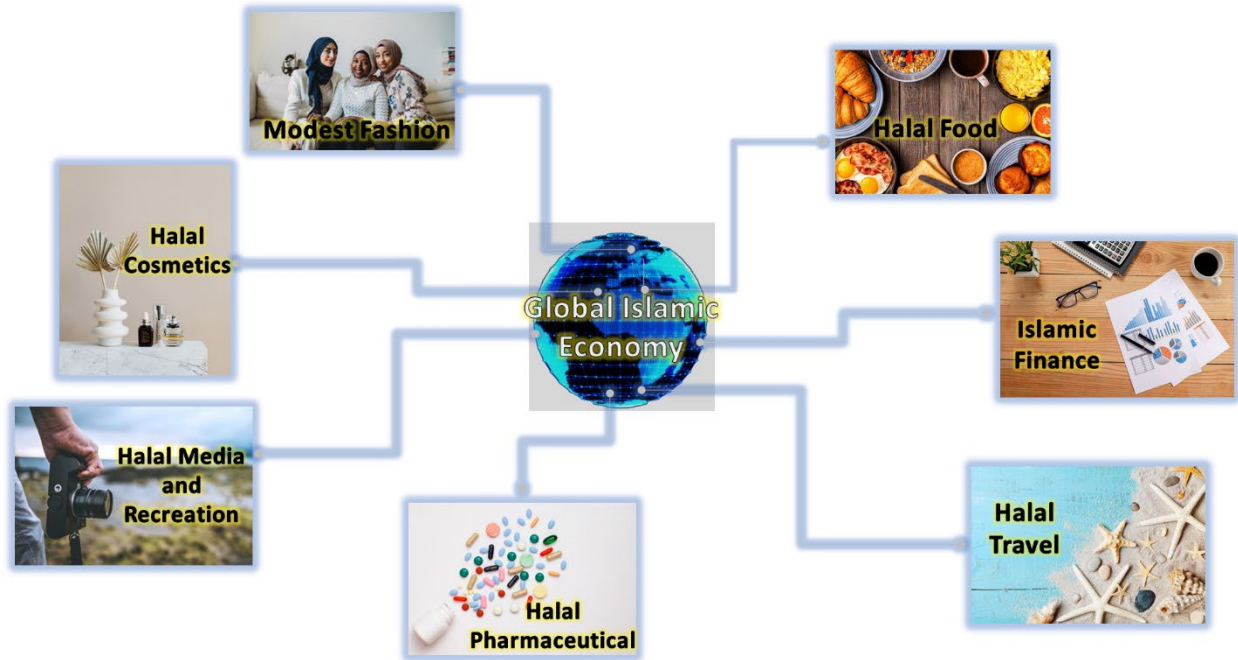

Figure 1: Sectors in Global Islamic Economy (adapted from Dinar Standard, 2020)

Halal has also been seen as an approach that is capable of transforming an industrial sector to become more viable as well as create economic spillover in various sectors. The growth in the halal industry has been supported by various stakeholders, from business entities to the government and consumers. Together, the network of stakeholders nestled in the environment surrounding them creates a halal ecosystem, "a network of components involved in the growth cycle and delivery of halal products or services" (HDC, 2018). Thus, the vastness of scope in the halal industry and the ecosystem translates into a comprehensive, economically viable, and lucrative industry. However, from the other end, the vastness of scope or theme in halal areas and its related fields seem to impede the growth of halal research, academic, and scholarly work. There have been concerns that while the halal industry is ballooning, there is a hollow in the field of halal research and academia (M. Ismail *et al.*, 2020). This imbalance is rather worrying, as academia is the cornerstone of any industry that nurtures and supports the development of human talent and spurs innovation in the field, which is then translated into the socio-economic development of a nation.

The root course of the above imbalance could be attributed to the elusiveness of the body of knowledge in the halal field. This could also be due to the keyword used, and the ubiquitous and underpinning yet overarching nature of the halal body of knowledge such that it could not simply fit into the traditional areas or sub-areas established in academia. Nevertheless, as shown in Table 1, the more recent scholarly work in halal areas conducted through systematic literature review and bibliometric

and content network analysis has provided more insights into the halal body of knowledge as well as identified gaps for future research.

Table 1: Research Theme/Focus Area Explicated from Systematic Literature Review, Content Analysis and Bibliometric Studies from Recent Publication

	Article title	Methodology/number of articles, database/year/keywords search	Findings: Research theme/Focus Area	Reference
1	Integrating the Internet of Things in the halal food supply chain: A systematic literature review and research agenda	Systematic Literature Review and bibliometric study /509/Scopus, Science Direct, Springer Link, Taylor and Francis, Emerald Insight, IEEE Explorer, Google Scholar/no starting point-present/specific string of keywords	Internet of things (IOT) in halal food supply chain	Rejeb, Rejeb, Zailani, *et al.* (2021)
2	*Are halal food supply chain sustainable: a review and bibliometric analysis*	Systematic Literature Review and bibliometric study /208 /Scopus and Web of Science/no starting point-present/specific string of keywords	Sustainable aspects of halal food supply chain	Rejeb, Rejeb, & Zailani (2021)
3	A bibliometric analysis on halal cosmetics over twenty years	Bibliometric study/82/2000-2020/Scopus/halal, cosmetics	Halal cosmetics – purchase intention, Islamic marketing	Azmi *et al.* (2021)
4	A literature review and classification of the studies on 'halal' in Islamic business journals (2010-2018)	Content analysis/56/2010-2018/Clarivate Analytics and Scopus/business, finance, management and Islam	Halal food, cosmetic, consumer products	Baran (2020)
5	Trend analysis on 13 years of halal research; investigation	Bibliometric study/444 (Scopus). <100 (Web of Science)/2005-2019/Scopus and WOS/halal, toyyib, halalan toyyiban	Halal product and halal food (consumer behaviour and outlook, halal slaughter, halal meat, food production)	M. Ismail *et al.* (2020)

	Article title	Methodology/number of articles, database/year/keywords search	Findings: Research theme/Focus Area	Reference
	on halal food research			
6	A knowledge domain visualization review of thirty years of halal food research: themes, trends and knowledge structure	Bibliometric study/290/1990-2019/Web of Science/halal	Slaughtering, slaughtered meat, perception, market, Islamic tourism	Mostafa (2020)
7	Halal food: structured literature review and research agenda	Systematic Literature Review and bibliometric study/221/1997-2020/Scopus/halal and food	Halal food and i) halal certification ii) halal awareness iii) product and quality iv) tourism management v) halal supply chain	Secinaro & Calandra (2020)
8	Visualising research literature in halal supply chain: a bibliometric analysis	Bibliometric study/104/2008-2018/Scopus/halal supply chain	Halal supply chain	Omar *et al*. (2020)
9	Halal food chain management: a systematic review of literature and future research directions	Systematic Literature Review/134/2003-2013/EBSCO host, Emerald Insight, Science Direct, Scopus, Springer Link, IEEE Explore/halal, halal food	Halal concept, halal certification, halal product attributes, consumer awareness of halal, halal marketing, information technology adoption in halal, halal integrity, halal food supply chain management	Omar *et al*. (2015)
10	Research status in halal: a	Systematic Review and bibliometric study/946/Scopus/2006-	Cluster i) halal supply chain and halal branding	Haleem *et al*. (2020)

	Article title	Methodology/number of articles, database/year/keywords search	Findings: Research theme/Focus Area	Reference
	review and bibliometric analysis	2019/halal, halal supply chain, halal authentication, halal and halal supply chain	ii) slaughtering and stunning iii) additives in halal food iv) food chemistry and associated sciences	
11	Halal tourism research bibliometric analysis in Scopus, ProQuest and Ebscohost	Bibliometric/383/Scopus, ProQuest, Ebscohost/1987-2019, halal tourism	Cluster of halal tourism in i) Scopus: research context, halal tourism context, halal industry, religious research ii) ProQuest: business, marketing halal, research element, tourism and halal iii) Ebsco: halal, muslim tourism, halal tourism,halal	M. N. Ismail *et al.* (2019)
12	Halal topic journal content analysis in Journal of Islamic Marketing, British Food Journal and Meat Science	Bibliometric and journal content analysis with crosschecking/JIM 280, BFJ 1361, MS 1852/Scopus/2010-2019/not applicable	Halal topics in i) JIM: marketing of halal products/services, Islamic knowledge element, research works, halal food industry ii) BFJ: human, Malaysia, article, certification, halal iii) MS: meat, abattoir, slaughterhouse, halal	M. Ismail *et al.* (2020)

The studies (Table 1) undertaken between 2019 and the present showed that many different halal themes and sectors are being researched. Some work also provided further insights into the sub-sectors and topics, while others attempted to categorise the areas into clusters. Bibliometric analysis has been reported to be able to capture the required information systematically and elegantly from published literature using statistical analysis and visualisation tools that help researchers to deduce the

evolution of certain research areas and forecast future trends (Ahmi and Mohammad, 2019).

Although bibliometric studies provide some ideas about the areas of interest, careful interpretation of the findings is always required as researchers use different approaches or search strategies. For instance, Ismail *et al*. (2020) limited their search based on title only, but used data citation rather than frequency of paper as a bibliometric indicator. Other researchers put limitations using different exclusion criteria, and some zoom into only specific journals. For example, Haleem *et al*. (2020) examine a wide scope of halal but exclude the banking and financial aspects of halal. Meanwhile, Ismail *et al*. (2020) examined halal topics in only three selected journals. There are also differences in the coverage periods of the published papers examined. The work undertaken in Table 1 spans the years 1990 to 2021. Nevertheless, bibliometric analysis has been the focus of many researchers. Omar *et al*. (2020) listed three reasons for choosing bibliometric analysis in their work: i) the ability bibliometric analysis to efficiently handle large amounts of articles, ii) the ability to capture comprehensive information, and iii) the visualisation of information that enables more effective interpretation of findings.

Based on Table 1, the halal food sector, including slaughtering and meat, seems to have been the most researched throughout the years. Researchers then began to investigate more specific areas using bibliometric analysis such as cosmetics (Azmi *et al*., 2021), halal supply chain (Omar *et al*., 2015) and tourism (M. N. Ismail *et al*., 2019). It is interesting to see further clustering of sub-sectors within the main sector, which could lead to more impactful research in untapped but highly important areas. However, it was also observed that the majority of these bibliometric research works cut across different components of halal in the areas of business and management, social science, and humanities, but less is focused on the scientific and technological aspects.

3. METHODOLOGY

This study involved data extraction from records in Scopus in the halal area. As the ultimate aim of the study was to identify the research gaps and potential future directions in halal-related research, we did not limit the search within a specific scope of halal. To aid a systematic literature search, we adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The selected records were then analysed using bibliometric and network analysis.

3.1 Data Sources

Considering that the halal area cuts across science and social science, this study employed the Scopus database as a source of data. Scopus is one of the largest scholarly databases, comprising both science and social science (Falagas *et al*., 2008; Mongeon and Paul-Hus, 2016; Vieira and Gomes, 2009). This database supplies among others publication details that include access type, year, author name, subject area, document type, source title, keyword, affiliation, country, source type and language.

In October 2020, the authors searched the Scopus database to identify articles with the term "halal" This exercise searched for articles that contain the term "halal" in their title, abstract, keyword and whole manuscript. The search was limited to publications from 1996 to 2020. The specific duration is chosen given the large scope of this article that attempts to comprehensively examine the evolution of halal research across various sectors.

The PRISMA guidelines were used to systematically analyse the data (Moher *et al*., 2010). PRISMA specifies four steps to follow and report when identifying and extracting information for a bibliometric review. Figure 2 shows the PRISMA flow diagram of this study.

Two researchers (MHAL and NSM) independently performed the initial analyses. In total, 1961 items were extracted from Scopus after keyword selection. After removing duplicates, the records were screened. Records in foreign languages (other than English, Malay, and Indonesian) as well as records with incomplete titles and technical errors were excluded. Three authors, YZH-YH, ANA, and NS, assessed the eligibility of the records. Finally, 1770 records were found to be relevant to the halal scope and were thus included in the study.
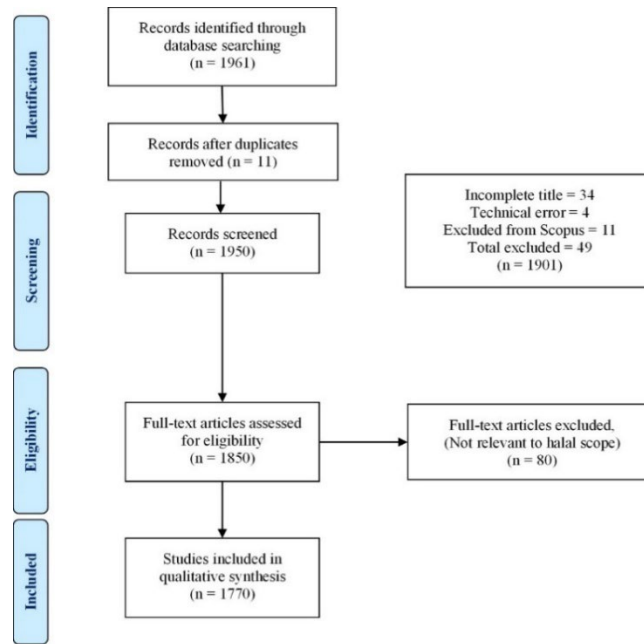
Identification

Records identified through database searching
(n = 1961)

Records after duplicates removed (n = 11)

Screening

Records screened
(n = 1950)

Incomplete title = 34
Technical error = 4
Excluded from Scopus = 11
Total excluded = 49
(n = 1901)

Eligibility

Full-text articles assessed for eligibility
(n = 1850)

Full-text articles excluded,
(Not relevant to halal scope)
(n = 80)

Included

Studies included in qualitative synthesis
(n = 1770)

Figure 2: PRISMA flow diagram for identifying Scopus publication within the halal scope between 1996 to 2020

3.2   Data Extraction

The search results in terms of graphical bibliometric data were readily visualised by accessing the imbued result analyser in the Scopus database. Subsequently, the search results containing 1770 manuscripts were exported in the Research Information System (RIS) format. Further analyses were performed to graphically map bibliographic data.

3.3   Bibliometric and Network Analysis

The search results were analysed using bibliometric and network analysis. Bibliometric analysis coupled with network analysis has been shown to be very useful for the measurement and assessment of a large number of articles to understand the emerging and established trends of topics of interest (S. Ismail *et al*., 2012; Mishra *et al*., 2018). VOSviewer software 1.6.13 and Publish and Perish v7 were used in this study. The evolution of halal research in multiple Islamic economic sectors (food, pharmaceutical, media and recreation, Islamic finance, cosmetics, halal travel) is further explored and mapped, mainly guided by the classification in the Global Islamic Economy Report (Dinar Standard, 2020) (Figure 1).

4.   RESULTS AND DISCUSSIONS

The results and discussions of bibliometric are presented in this section.

4.1   Document Types

Table 2 shows that the documents published on halal in the Scopus database were spread into nine document types. Almost three-quarters of the total publications are in the form of articles (72.32%), followed by conference papers (11.41%), reviews (6.78%), and book chapters (5.31%). Other types of documents represented less than 5% of all publications. The majority of conference papers were published by the IOP Conference Series and IAP Conference Proceedings.

Review papers were recorded as early as 2000 in various halal themes, suggesting that researchers have been engaged in building a halal body of knowledge and finding gaps. However, the low percentage (less than 10%) of review papers shows the paucity of scholarly contributions to halal. This is somewhat worrying considering that the halal industry has taken off tremendously in the last two decades, while the halal body of knowledge based on scholarly contributions seems to be not at par with the industry. Similarly, the cumulative percentage of book chapters and books was only 6.04%. More effort must be put in to publish these types of publications in the quest to uphold halal as a research theme that can be translated to industry or practice to benefit society.

Nevertheless, the halal theme has surfaced in the industry setting as captured in Food Manufacture, a free newsletter published by a media company dedicated to informing business growth. Scopus categorised this document type as a note. In 2002, one document of this type (on a halal theme) was published in Nature.

Table 2. Document By Type

Document Type	Frequency	% (N=1770)
Article	1280	72.32
Conference Paper	202	11.41
Review	120	6.78
Book Chapter	94	5.31
Note	41	2.32
Book	13	0.73
Short Survey	11	0.62
Editorial	6	0.34
Letter	3	0.17
		1770
Grand Total	**1770**	

4.1.1   Documents by Author

Table 3 lists the top 20 authors based on the number of publications. The authors represented various themes of halal. Looking into at least the top ten of the lists, the majority are working in the areas of science, technology, and applied science, except for Fischer, J. Zailani, S. and Ali, M.H.

Table 3: Document by author

Author	Documents
Rohman, A.	43
Ali, M.E.	20
Fischer, J.	19
Mustafa, S.	19
Sazili, A.Q.	18
Zailani, S.	17
Ali, M.H.	16
Che Man, Y.B.	16
Regenstein, J.M.	16
Jaswir, I.	15
Khan, M.I.	15
Haleem, A.	12
Tieman, M.	12
Fuseini, A.	11
Goh, Y.M.	11
Khan, S.	11
Zulkifli, I.	11
Erwanto, Y.	10
Gregory, N.G.	10
Hashim, U.	10

i)   Year of Publications - Evolution Of Published Studies

Table 4 summarises the data for annual publications of halal-themed items from 1996 to 2020. As per Scopus records, the first halal-themed item published in 1996 was by Willocks *et al*. (1996). The article reported that halal chicken was associated with infection of *Salmonella virchow* PT 26 in a subset of the national case control study conducted in England and Wales in 1994. The growth of related publications was slow during the first ten years with less than 10 publications per year. However, an exponential trend was observed in later decades. The highest number of publications was observed in 2019, with 295 documents (16.67%).

Table 4: Year of Publications

Year	Frequency	% (N=1770)
2020	225	12.71%
2019	295	16.67%
2018	250	14.12%
2017	212	11.98%
2016	171	9.66%
2015	130	7.34%
2014	107	6.05%
2013	94	5.31%
2012	97	5.48%
2011	67	3.79%
2010	24	1.36%
2009	27	1.53%
2008	18	1.02%
2007	10	0.56%
2006	9	0.51%
2005	3	0.17%
2004	7	0.40%
2003	7	0.40%
2002	5	0.28%
2001	3	0.17%
2000	3	0.17%
1999	2	0.11%
1998	1	0.06%
1997	2	0.11%
1996	1	0.06%
Grand Total	1770	100.00%

ii)   Languages of Documents

Table 5 shows the frequency of all the languages of publication. At this stage, we did not filter the publications based on language as we aimed to investigate the overall picture of publication of halal related area including in Muslim minority countries, by looking at the languages they are published in, based on the single keyword search of 'halal', which yielded a total of 1901 articles. For further study, we screen out articles that are not linked to halal scope and only analyse the articles that can be understood, which includes a total of 1770 articles written in English, Malay, and Indonesian.

While most of the publications in this research domain have been published in English (1803; 94.84% of total publications), it is interesting to see that the next language by frequency is Hungarian, followed by German, French, and Italian. Apparently, the system detected the word 'halal' which translates to 'death' in the title and abstract of

publication in Hungarian hence not related to this review. However, some publications in German were related to halal, with several being published as early as 2009. Further, some articles on halal were also found to be published in Korean, Japanese, Serbian, and Russian languages. Despite being a Muslim majority country, only six articles were published in Malay and the Indonesian language. The topics in these articles include gelatine, cultured meat, blood plasma, and pcr-rflp authentication techniques. However, it is argued that the small number of articles in these languages does not portray the actual scenario of publication in a halal scope, considering that local publications are often not indexed in Scopus.

Table 5: Languages used for publications

Language	Frequency	% (N=1901)
English	1803	94.84%
Hungarian	24	1.26%
German	14	0.74%
French	11	0.58%
Italian	6	0.32%
Spanish	5	0.26%
Turkish	5	0.26%
Chinese	5	0.26%
Malay	4	0.21%
Japanese	3	0.16%
English; German	3	0.16%
Polish	3	0.16%
Portuguese	2	0.11%
Russian	2	0.11%
Indonesian	2	0.11%
Swedish	1	0.05%
Serbian	1	0.05%
English; French	1	0.05%
Persian	1	0.05%
English; Dutch	1	0.05%
Croatian	1	0.05%
Korean	1	0.05%
English; Indonesian	1	0.05%
English; Spanish	1	0.05%
Grand Total*	1901	100.00%

Grand total is 1901 includes

iii)   Subject Area

Table 6 summarises the frequency of published documents based on the subject area, as categorised by Scopus. The distribution is diverse, indicating the various scopes of halal research. The top three subjects were business, management, and

accounting (19.2%), followed by agricultural and biological sciences (15.3%), and social sciences (11.5%). While there have been challenges in defining the term 'halal science, it is intriguing to see that the ratio between publication in applied science and technology to social science, art, and humanities is about 1:1(excluding other subject areas). It is also noteworthy that this current work includes the subject areas of economics, econometrics, and finance that have mostly been excluded by previous bibliometric studies. Although this subject area is a mature area and often stands on its own, its underpinning role in halal practices and industry warrants further work from a more holistic perspective. It is also argued that publications related to religion and, more specifically, shariah (Islamic law), were not substantially captured despite halal being a faith-based topic.

Table 6: Subject Area

Subject area	Frequency	% (N=1770)
Business, Management and Accounting	341	19.2
Agricultural and Biological Sciences	271	15.3
Social Sciences	205	11.5
Engineering	159	9.0
Computer Science	122	6.9
Economics, Econometrics and Finance	101	5.7
Arts and Humanities	89	5.0
Environmental Science	58	3.3
Medicine	55	3.1
Biochemistry, Genetics and Molecular Biology	53	3.0
Others	316	17.8
Total	1770	100

4.1.2 Documents by Affiliation

As shown in Table 7, the top ten affiliations by frequency are dominated by institutions in Malaysia. Many of these universities have dedicated halal institutes or centres, with specific academic programmes in halal areas being offered at the undergraduate and postgraduate levels. Academic research work, particularly at the postgraduate level, helps develop the body of knowledge while nurturing talent, honing skills, and producing publication as the major output. Universiti Putra Malaysia established its Halal Products Research Institute (HPRI) in 2006, and Universiti Teknologi MARA had its Academy of Contemporary Islamic Studies (ACIS) (2013), and the International Islamic University Malaysia established its International Institute for Halal Research and Training (INHART) in 2011. Nonetheless, the development of these entities began much earlier under various roles and capacities.

Table 7: Documents by affiliation

Affiliation	Document
Universiti Putra Malaysia	137
Universiti Teknologi MARA	122
International Islamic University Malaysia	113
Universiti Kebangsaan Malaysia	93
University of Malaya	89
Universiti Teknologi Malaysia	67
Universiti Sains Malaysia	66
Universiti Utara Malaysia	57
Universitas Gadjah Mada	51
Universiti Sains Islam Malaysia	43
Total	838

i)   Most Active Source Titles

Table 8 shows that the Journal of Islamic Marketing was the most active source title, dominating almost 10% of the total publications in the query. The second in the list, the International Journal of Supply Chain Management was quite far behind, with only 3.20%. The remaining publications were between 0.67% and 2.24%. It is noticeable that food is the top theme, although the scope could lie either in science, technology, applied science, social science, art, and humanities. It is also interesting to see that conference proceedings are some of the most active titles that have helped put halal research in the radar of high-quality documents indexed in Scopus.

Table 8: Most Active Source Title

Source Title	No of Documents	%
Journal of Islamic Marketing	176	9.88
International Journal of Supply Chain Management	57	3.20
Meat Science	40	2.24
International Food Research Journal	38	2.13
Food Manufacture	36	2.02
British Food Journal	34	1.91
Advanced Science Letters	24	1.35
IOP Conference Series: Earth and Environmental Science	21	1.18
IOP Conference Series: Materials Science and Engineering	20	1.12
Pertanika Journal of Social Sciences and Humanities	19	1.07
Food Research	19	1.07
Malaysian Journal of Consumer and Family Economics	17	0.95
AIP Conference Proceedings	17	0.95
International Journal of Innovation, Creativity and Change	16	0.90
Journal of Food Products Marketing	14	0.79

Trends in Food Science and Technology	14	0.79
Asian Social Science	14	0.79
International Journal on Advanced Science, Engineering and Information Technology	13	0.73
Tourism Management Perspectives	12	0.67
Food Control	12	0.67

ii) Keywords Analysis

Author keywords portray the concepts that the authors wish to communicate and, thus, are used to identify the research topics or focus areas (Zhong *et al.*, 2016). After excluding generic keywords – halal, Islam, and countries (e.g. China, Malaysia, Indonesia, Pakistan, Turkey), ten different colours reflecting ten clusters emerged. These clusters focus on 10 diverse research themes or focus areas generated from 184 keywords (of 4185) (Table 9).

**Table 9**: Halal research clusters based on author keywords.

| Cluster	No. of keywords	Keywords	Research/ Focus Area	Discipline
1 Red	24	adulteration, authentication, authenticity, chemometrics, collagen, extraction, fish, food products, FTIR, FTIR spectroscopy, gelatin, gelatine, halal authentication, halal standards, halal supply chain (HSC), halal supply chain management (HSCM), lard, mass spectrometry, meat, meatball, mitochondrial DNA, PCR, PCR-RFLP, pig, polymerase chain reaction, porcine, pork, principle component analysis, real-time PCR, wild boar	Halal authentication	Science
2 Emerald	24	advertising, brand equity, brand loyalty, branding, China, consumer behaviour, consumption, cosmetics, halal brand, halal logo, halal market, halal products, Islamic branding, Islamic business ethics, Islamic marketing, Islamic markets, JAKIM, Malaysia, marketing, Muslim, Muslim consumers, purchase intention, selling to	Halal market and marketing	Social science

Cluster	No. of keywords	Keywords	Research/ Focus Area	Discipline
		Islamic markets, shariah, subjective norms, the Muslim consumer		
3 Yellow-green	22	acculturation, certification, food, food safety, globalisation, HACCP, halal marketing, halal standard, identity, kosher, multiculteralism, Muslims, nutrition, policy, regulation, religion, ritual slaughter, safety, sharia, supply chain management, theory of planned behavior, theory of planned behaviours, turkey, willingness to pay,	Halal certification	Social science
4 Purple	22	alcohol, beef, ethanol, food supply chain, halal assurance system, halal concept, halal cosmetics, halal logistic, halal supply chain, Islamic values, Muslim consumer, perceived value, poultry, RFID, sentiment analysis, treaceability, twitter	Halal Logistic and Halal Supply Chain	Science and social science
5 Brown	19	adoption, buying behaviour, challenges, food adulteration, food manufacturer, halal awareness, halal food, halal food industry, halal food products, halal food supply chain, halal integrity, halal meat, intention, Islamic attributes, logistics, Muslim tourists, SMES, TPB	Halal food	Social science
6 Pink	18	acceptance, attitude, attitudes, behaviour, business, consumers, culture, consumer satisfaction, enterpreneurship, halal industry, Islamic, Islamic banking, Islamic finance, performance, religiosity, subjective norm	Behavioural study	Social science
7 Light brown	17	awareness, barriers, food quality, halal certificate, halal certification, halal foods, halal hospitality, halal tourism, knowledge, Muslim travellers,	Halal tourism	Social science

Cluster	No. of keywords	Keywords	Research/ Focus Area	Discipline
		perception, restaurant, supply chain, tourism		
8 Pink	16	animal welfare, bleeding, blood, cattle, chemical composition, GC-MS, goat, halal slaughter, meat quality, religious slaughter, shechita, sheep, slaughter, stunning	Slaughtering and animal welfare	Science
9 Blue	15	consumer, fatwa, fish gelatine, food industry, food security, gel strength, halal logistics, halal product, halal supply chain management, haram, innovation, Islamic perspective, istihalah, literature review	Gelatine	Social science and humanities
10 Brown	9	halal restaurant, loyalty, non-Muslim, quality, satisfaction, service quality, strategy, trust	Halal services	Social science

The clusters were also visualised as a network map, as shown in Figure 3. In each cluster, the biggest node was identified and used to name the research/focus areas, except for Cluster 10, whereby "halal services" were used to better reflect the focus area in the cluster, as indicated by the keywords. Keyword analysis shows the extensive coverage of halal studies and research.
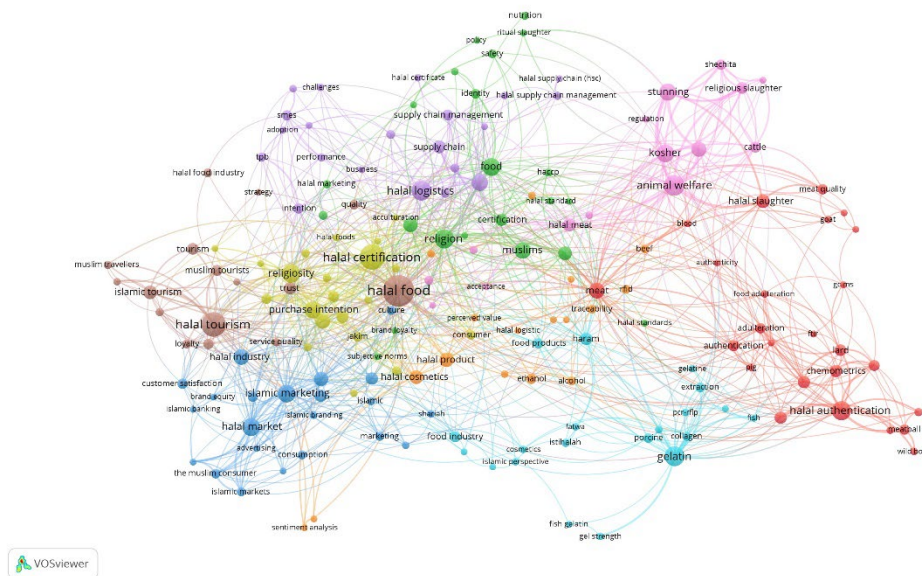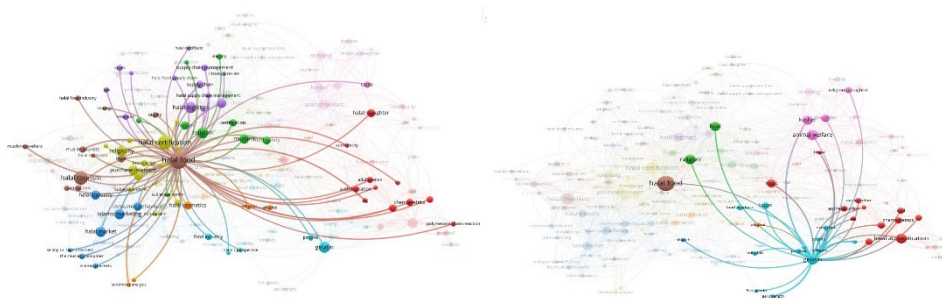
Figure 3: The analysis of key word co-occurrence on halal research (a) overview (b) cluster 5 (halal food) (c) cluster 9 (gelatine)

Cluster 1 is a pure science-based cluster, covering studies associated with halal authentication (e.g. keywords including adulteration, authentication, authenticity). Multiple instruments and analytical methods such as mass spectrometry, mitochondrial DNA, and polymerase chain reaction (synonymous keywords include pcr, pcr-rflp) for testing of potential adulteration or cross-contamination of non-Halal ingredients or products (e.g. meat, meatball). There are also several keywords (e.g. collagen, extraction, fish, and gelatine) that reflect efforts to offer halal alternative processes and ingredients.

Cluster 2 is the second largest cluster identified and is associated with halal markets and marketing. This cluster encompasses keywords related to social science disciplines such as advertising, brand equity, brand loyalty, branding, consumer behaviour, consumption, cosmetics, halal brands, and halal logos. Cluster 3 relates to studies on halal certification. Frequent keywords (e.g. theory of planned behaviour, willingness to pay) in Cluster 3 imply an association between studies focusing on determinants of purchase intention and willingness to pay for products with halal certificates. Cluster 4 focuses on halal supply chains and logistics. Interestingly, studies in this cluster showed crossover between two disciplines: pure science and social science. Studies in pure science discipline primarily focus on the application of technology (e.g. RFID) to ensure traceability in the halal supply chain. On the other hand, studies in social science have focused on the halal supply chain and logistics management, risks, and strategies. Cluster 5, one of the central nodes (Figure3 (a)), relates to studies on halal food. As shown in Figure 3 (b), the visualisation of Cluster 5 shows extensive networks, crossing over multiple disciplines (e.g. science and social science) and sectors/sub-sectors (e.g. food and meat industry, logistics, tourism), indicating the prominence of halal food not only as a sector but also as a research/focus area.

Cluster 6 explores behavioural studies and is linked with keywords such as Islamic finance and banking, suggesting that the major focus areas of Islamic finance and banking are behavioural aspects (e.g. acceptance, attitude(s), and satisfaction) related to halal finance services. The fact that Islamic finance and banking appear in the

network suggests that this field is indeed an integral part of the entire halal ecosystem landscape. It is noteworthy that this finding is one of the uniqueness of this present bibliometric work, as previous work excludes the Islamic and banking fields. Cluster 7 formed an emerging halal research area, halal tourism. The co-occurrence of keywords such as food quality, halal certificate/certification, and halal foods in this cluster reveal the major attributes in the selection of travel destinations by Muslim tourists.

Cluster 8 formed a more mature halal research field on animal slaughtering techniques and welfare. Cluster 8 is another cluster associated with pure science discipline, apart from Cluster 1 (as described earlier). Of the ten clusters that emerged, only these two clusters were associated with pure science-based disciplines. Nevertheless, the size and networks of these two clusters (especially halal authentication) are rather extensive.

Cluster 9 consists of research on gelatin. Gelatine is a unique keyword that refers to one of the most critical ingredients in halal products. The high frequency of keyword "gelatine" may indicate concerns regarding its applications in the halal industry. As shown in Figure 3(c), closer observation of this cluster indicates that gelatine has been studied from multiple perspectives, including Islamic (e.g. relates to fatwa, istihalah), science (e.g. authentication and slaughtering), and management (logistics and supply chain). It is also noted that while interdisciplinary research can promote collaboration, communication, and knowledge sharing across scientific traditions, disciplines, and sectors, out of 10 clusters, only two clusters (Clusters 4 and 9) show an interdisciplinary network. This suggests opportunities for a more interdisciplinary approach in halal research. Finally, Cluster 10 focuses on halal services such as restaurants, satisfaction, and service quality.

4.2   The Evolution of Halal Research Based on High-Frequency Keywords

The evolution of high-frequency keywords in halal research over the past decades (1996–2020) was evaluated (Figure 4). The different colours of the nodes describe the timeline of the publication; darker nodes (blue–purple) indicate earlier keywords and lighter nodes (green-yellow) indicate more recent keywords. In the earlier years, keywords such as 'meat', "religious slaughter" and "cattle" were among the most frequent and prominent. The keyword RFID, a technology that allows real-time tracking of halal traceability, also appears in the early years of halal research, but this keyword has lost its prominence in recent years. This could be due to complexity and high adoption costs which contribute to the slow adoption of RFID and other traceability technologies (e.g. barcode scanning and smartphone applications) in food (Goodson, 2020; Laurent *et al*., 2015). This probably dampens research interest in this area. However, acceleration of digital transformation in response to COVID-19 may

renew interest in the application of emerging technologies in supply chain management and logistics (Horwitz, 2020; Vaughan, 2021). In a recent study, Rejeb *et al*. (2021) argued that while there have been challenges in the use of information technology in halal sectors, the authors are positive that the integration of the Internet of Things, at least in the specific area of the halal food supply chain.
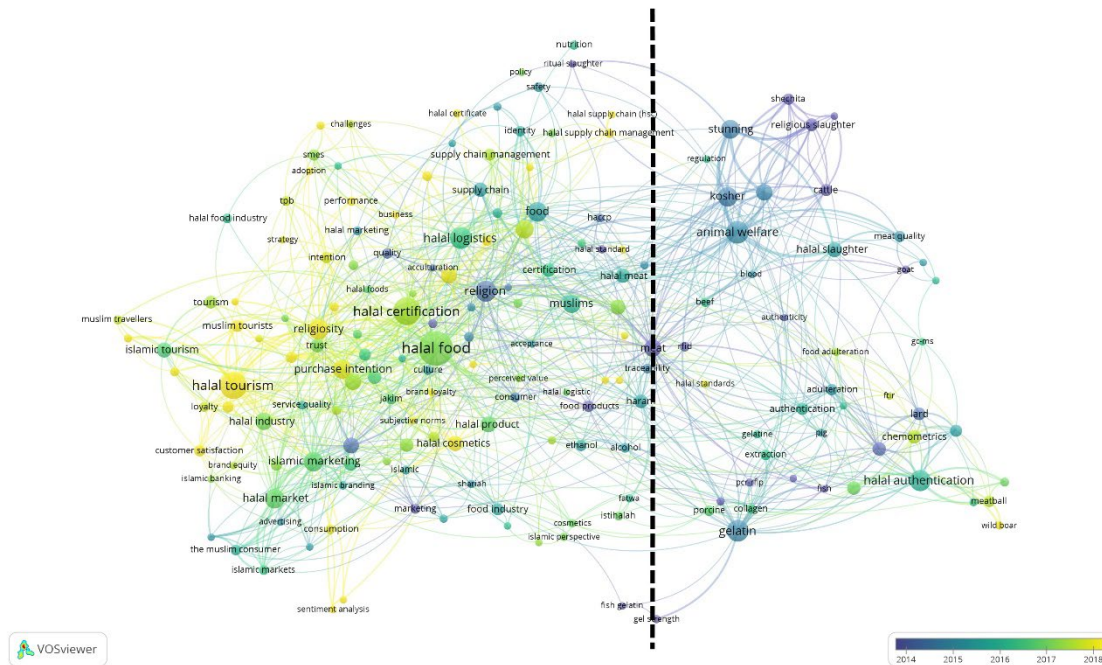
Figure 4: Overlay visualisation of keyword analysis from 1996 to 2020

Few topics were anticipated by the authors to emerge as clusters, but they did not. One of these research areas is the application of information and communication technology (ICT) in halal sectors. With the emergence of digitalisation and technological innovations such as artificial intelligence (AI) and blockchain in various sectors, especially Islamic finance, it is interesting to observe the trend of ICT publication in halal sectors, beyond the halal traceability scope in the next few years.

It is initially expected that the research topics on halal alternative products and processes would emerge as their own cluster in keyword analysis, but that is not the case. This could be due to the lack of adoption of the term halal alternative as the keywords in the published articles. This contrasts with the term 'halal authentication, which is widely used by the authors in their article keywords to describe the analytical process to verify that a food product follows the halal requirements. For efficient retrieval and sharing of halal knowledge as well as building the halal knowledge taxonomy, it is highly recommended for researchers who intend to share on alternative halal products, ingredients/materials, or process to use 'halal alternative' as one of their keywords in the future.

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It is also notable that although the foundation and principles in halal research could be traced back to Islamic studies discipline, the topics or keywords related to Islamic studies did not emerge as clusters on their own. Another key observation is the lack of studies on halal education and training. There was also a lack of study in the halal curriculum, when compared to the growth and expansion of knowledge in halal sectors. These understudied topics seemed to reflect areas in which researchers can make substantial contributions to advance scholarship in halal research.

Keywords such as safety, quality, HACCP which reflect quality and food safety management, and the systems used in the industry are also more prominent in the earlier years. This may reflect the maturity of the halal certification program as a management system over the years. The timeline also suggests a shift from only a pure science-based approach (e.g., halal authentication; slaughtering, animal) to a broader insight, including social science and humanities approaches, indicated by nodes of keywords such as halal certification and Islamic market (in Figure 3) and further supported by several non-science disciplines seen in the clusters in Table 9.

In this discussion (and as seen in Table 9), the authors use the conventional definition of (pure) science and social science to indicate the discipline to which the research areas belong. This is to facilitate the analysis of the evolution of research related to the technoscience of halal as compared to the social, management, and business aspects. The authors were also curious to see if the keyword 'halal science' emerged as a term to reflect pure science-related research given the increasing popularity of the term 'halal science' in the halal research vicinity. However, this was not evident in the course of this bibliometric study. This is probably due to a lack of conceptual clarity of the term itself. Said and Hanapi (2019) argued that halal science is a branch of philosophy in Islamic science, thus warranting rigorous research into the philosophy of halal science that nestled in a triangular element of Tawheed, Wahyu (revelation), and the roles of humankind in managing and using halal science products or services. In an earlier paper, halal science referred to research activities about halal that involved the use of science and technology (Said and Hanapi, 2019). Halal science is defined as halal knowledge attained systematically through observation and experimentation studies and practice to describe and explain the natural phenomena that relate to halal practices (ASM, 2019). To this end, it is clear that very little has been focused on providing conceptual clarity of the term, let alone to arrive at its practical utilisation. As such, this requires more work in this area.

Other trends observed in this study include an increasing number of publications on halal cosmetics, halal food supply chain and logistics, and halal tourism, implying the expansion of halal research beyond the scope of halal food and meat products. In a nutshell, keyword analysis shows the broad umbrella of halal research, encompassing and bridging several disciplines.

4.3   Citation Analysis

This section discusses findings related to citations, including citation metrics, most influential articles, geographical distribution, and citations by source.

i)   *Citation metrics*

Recognition of research output is measured by formal publication and citation, with the latter often equating the credibility of the published data. Table 10 summarises the citation matrices of the 1770 articles investigated in the search results. There was a total number of 18,288 citation counts across all papers with the h-index of 61 and the average number of 731.52 citations per year.

Table 10: Citation Metrics

Metrics	Data
Publication years	1996-2020
Citation years	25 (1996-2021)
Papers	1770
Citations	18288
Citations/year	731.52
Citations/paper	10.33
Authors/paper	3.31
h-index	61
g-index	91

ii)   *Most cited articles*

Table 11 shows the top 20 most influential papers. The most cited article was written by Alam and Sayuti (2011), with a total of 256 citations. This article was published in the International Journal of Commerce and Management in 2011. In this study, the authors used Ajzen's theory of planned behaviour as a theoretical framework to investigate halal food purchasing behaviour in Malaysia, where factors such as attitude, subjective norm, and perceived behavioural control were analysed using multiple regression analysis. The results showed that these factors positively influenced halal food purchasing intention (Alam and Sayuti, 2011). The second and the third most influential articles were from Wilson and Liu (2010). The article titled "Shaping the Halal into a brand?" received 253 citations, while the article titled "The challenges of Islamic branding: Navigating emotions and halal" received 242 citations. Both articles were published in the Journal of Islamic Marketing.

Table 11. Highly cited articles - most influential papers

No	Authors	Title	Year	Cites	Cites per year
1.	S. Shah Alam, N. Mohamed Sayuti	Applying the Theory of Planned Behavior (TPB) in halal food purchasing	2011	256	25.6
2.	J.A.J. Wilson, J. Liu	Shaping the Halal into a brand?	2010	253	23
3.	J.A.J. Wilson, J. Liu	The challenges of Islamic branding: Navigating emotions and halal	2011	242	24.2
4.	S. Lada, G. Harvey Tanakinjal, H. Amin	Predicting intention to choose halal products using theory of reasoned action	2009	230	19.17
5.	S.-S. Choi, J.M. Regenstein	Physicochemical and sensory characteristics of fish gelatin	2000	221	10.52
6.	A.A. Karim, R. Bhat	Gelatin alternatives for the food industry: recent developments, challenges and prospects	2008	205	15.77
7.	K. Bonne, I. Vermeir, F. Bergeaud-Blackler, W. Verbeke	Determinants of halal meat consumption in France	2007	203	14.5
8.	A. Mukhtar, M.M. Butt	Intention to choose Halal products: The role of religiosity	2012	171	19
9.	A. Rohman, Sismindari, Y. Erwanto, Y.B. Che Man	Analysis of pork adulteration in beef meatball using Fourier transform infrared (FTIR) spectroscopy	2011	169	16.9
10.	K. Bonne, W. Verbeke	Religious values informing halal meat production and the control and delivery of halal credence quality	2008	150	11.54
11.	K. Nakyinsige, Y.B.C. Man, A.Q. Sazili	Halal authenticity issues in meat and meat products	2012	140	15.56
12.	M. Tieman	The application of Halal in supply chain management: In-depth interviews	2011	137	13.7
13.	M.A. Asgar, A. Fazilah, N. Huda, R. Bhat, A.A. Karim	Nonmeat protein alternatives as meat extenders and meat analogs	2010	137	12.45
14.	A.A. Aida, Y.B.C. Man, C.M.V.L. Wong, A.R. Raha, R. Son	Analysis of raw meats and fats of pigs using polymerase chain reaction for Halal authentication	2005	130	8.13
15.	U. Derigs, S. Marzban	Review and analysis of current Shariah-compliant equity screening practices	2008	128	9.85

No	Authors	Title	Year	Cites	Cites per year
16.	Y.A. Aziz, N.V. Chok	The Role of Halal Awareness, Halal Certification, and Marketing Components in Determining Halal Purchase Intention Among Non-Muslims in Malaysia: A Structural Equation Modeling Approach	2013	122	15.25
17.	C. Murugaiah, Z.M. Noor, M. Mastakim, L.M. Bilung, J. Selamat, S. Radu	Meat species identification and Halal authentication analysis using mitochondrial DNA	2009	117	9.75
18.	K. Bonne, W. Verbeke	Muslim consumer trust in halal meat status and control in Belgium	2008	117	9
19.	M. Battour, M.N. Ismail	Halal tourism: Concepts, practises, challenges and future	2016	107	21.4
20.	Ã–. Sandikci	Researching Islamic marketing: Past and future perspectives	2011	107	10.7

Figure 5 shows the network visualisation map reflecting the citation based on the total number of documents depicted in Table 11.
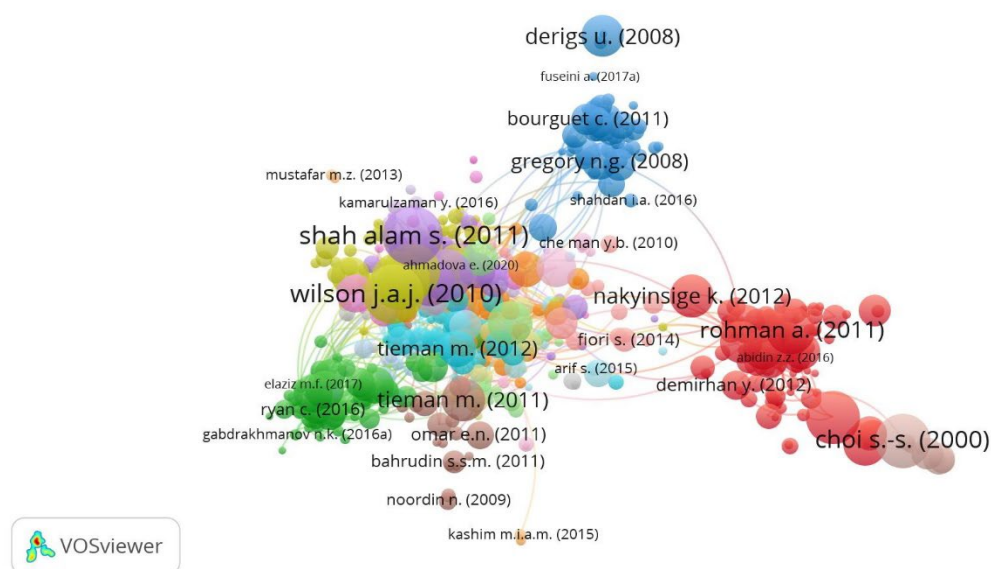
Figure 5: Network visualization map of the citation by documents

iii)   *Geographical distribution of publications and citation - most influential*

Table 12(a) shows the top 10 countries contributing to the publications in halal areas, while Table 12(b) shows the most cited article based on geographical

distribution. Malaysia outnumbered other countries in both categories with the highest number of publications (807) and the highest number of citations (8,679).

This achievement could be attributable to the efforts made by Malaysia over the years in becoming a compelling player in the halal global market. Malaysia has indeed been actively promoting various halal research and economic areas, including science, business, marketing, social science, and law. In addition, the synergism between institutions responsible for gearing up the halal industry (JAKIM, HDC) together with the academic institutions in Malaysia has been reported to play an important role in maintaining its competitive position in the global halal industry (Rejeb, *et al*., 2021).

The next top country is Indonesia, with 300 publications, followed by the United Kingdom with 138 publications. The opposite trend was observed in Table 12(b), where the United Kingdom received a higher citation count than Indonesia despite the small Muslim population. This indicates a growing interest and halal market in Europe. Tracing down the trend of the highly cited journal in the United Kingdom, as shown in Table 13, the top five in the list are mostly higher indexed journals which correspond to higher quality journals such as Journal of Islamic Marketing, Meat Science, British Food Journal, and Tourism Management, hence contributing to higher citation. It is perplexing to see that none of the important Middle East Islamic countries make it to the list, except Turkey. Figure 6 shows the corresponding network visualisation map of the most influential country in producing halal-related publications and citations based on the geographical
distribution generated using VOSviewer.

Table 12 (a): The top 10 countries contributing to the publications in halal areas

Country	Documents
Malaysia	807
Indonesia	300
United Kingdom	138
United States	91
Australia	67
Pakistan	44
India	40
China	36
Thailand	36
Turkey	35

Table 12 (b): Most cited document by country

Country	Citations
Malaysia	8679
United Kingdom	2760
Indonesia	1350

Country	Citations
United States	1294
Australia	861
Turkey	679
France	671
Germany	670
Belgium	590
United Arab Emirates	563

Table 13: List of the most cited journal in United Kingdom

| List of Journal	Citation counts
Journal of Islamic Marketing	773
Meat Science	428
British Food Journal	269
Tourism Management	136
Animal Welfare	132
Journal of Rural Studies	100
Journal of Business Research	81
Tourism Management Perspectives	78
International Journal of Social Economics	64
Progress in Colloid and Polymer Science	60
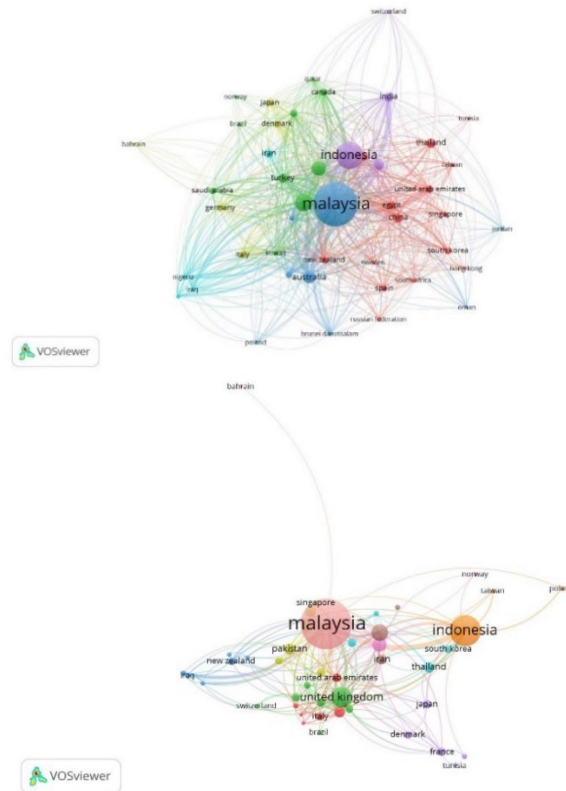
Figure 6: Network visualisation map (a) most influential country (b) most cited article based on country

iv)   *Citation by Source*

Table 14 and Figure 7 represent the bibliometric results of the leading journal halal from Scopus based on citation count and network visualisation map, respectively. The results show that the Journal of Islamic Marketing (JIMA) is the leading journal in Halal with a total citation number of 3,160 from a total of 176 articles related to halal. A significant difference was observed in document count from JIMA and the second position journal (Meat Science) which confirms its influence based on the quality of the journal (Mubarrok *et al*., 2020). Nevertheless, the average citation count per number of documents shows that the Meat Science journal still holds its own prestige in halal subject matters.

Table 14: List of citation per source

Source	Documents	Citations
Journal of Islamic Marketing	176	3160
Meat Science	40	1989
British Food Journal	34	930
Tourism Management Perspectives	12	469
Trends in Food Science and Technology	14	429
Journal of International Food and Agribusiness Marketing	9	327
Food Control	12	320
International Food Research Journal	38	309
Food Analytical Methods	10	276
Tourism Management	5	273
Food Chemistry	8	238
Journal of Food Products Marketing	14	220
Animal Welfare	8	176
Asian Social Science	14	126
International Journal of Supply Chain Management	57	120
Journal of The Science of Food and Agriculture	5	87
Asian-Australasian Journal of Animal Sciences	7	76
International Journal of Food Properties	7	74
Sustainability (Switzerland)	5	74
International Business Management	7	70
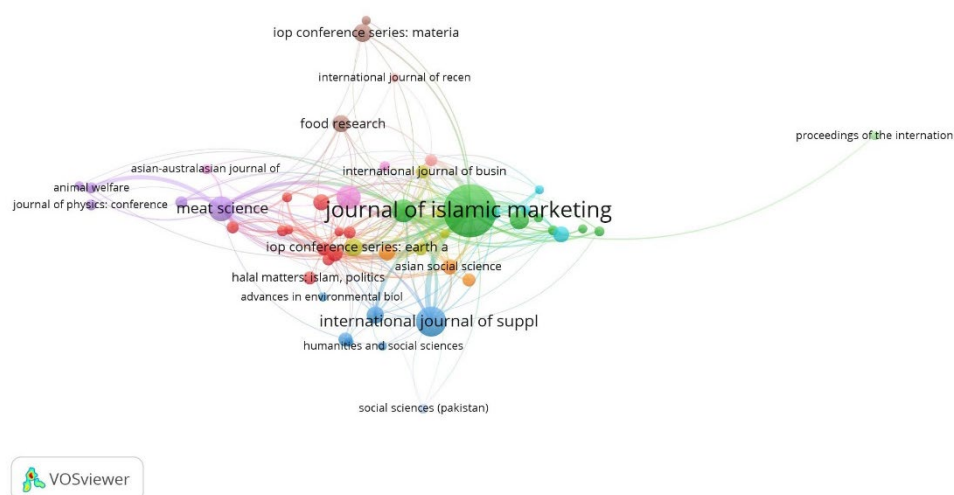
Figure 7: Network visualization map of the citation by source

v)   *Mapping The Evolution of Halal Research to Islamic Economic Sectors*

This study also explores the evolution of halal research in multiple Islamic economic sectors classified in the Global Islamic Economy Report (Dinar Standard, 2020). Table 15 shows the classifications of articles based on the multiple Islamic economy sectors. As anticipated, studies conducted in the context of the food sector constitute more than half (65%) of the total articles published in halal research. There has been a steady increase in the number of publications over the years. The percentage (65%) is comparatively higher than other sectors such as pharmaceuticals (1.7%), media and recreation (0%), Islamic finance (4.8%), cosmetics (2.5%), and halal travel (8.4%). There are also articles in which data were collected from a combination of sectors, such as food, cosmetics, and pharmaceutical sectors (1.3%).

The modest fashion sector is considered by many authors as the untapped halal market, and as such, it is hardly surprising that only four articles were published in this context over the past 25 years, with the first article published in 2018. Given the variation in cultural, social, and regulatory aspects of Muslims in different countries, research on modest fashion can generate insights that will not only contribute to the halal literature, but will also be the point of reference for the modest fashion industry (Radwan *et al.*, 2019). Possible future studies include modest fashion brand differentiation to attract new consumers while maintaining existing consumers, acceptance, and conceptual clarity of modest fashion.

The media and recreation sector consists of "recreation & culture" products and services, which include movies, drama series, online content, apps, and music aimed at Muslim lifestyle needs (Dinar Standard, 2019). The media and recreation industry was valued at around $209 billion in 2019 and is expected to grow to $288 billion by 2023 (Dinar Standard, 2020). Despite the huge demand, academically, there is no

specific article that can be mapped into the media and recreation sector. The lack of academic focus in this sector could be one of the reasons for this. It is also possible that, rather than halal, terms such as 'Islamic' or 'Islamic' themes are more frequently used in this sector. Nevertheless, these findings indicate opportunities to intensify research in these two core economic sectors.

There are several articles that could not be mapped into the six core economic sectors, which may represent an emerging sector or industry in halal. In this study, a sector is referred to as "a segment of the economy," whereas an industry is a subset of sectors that group specific companies or businesses. Health sector (1.8%) is one of the emerging sectors, covering multiple topics such as medical devices, medical tourism, and Muslim-friendly hospitals. There are also a few articles that represent emerging industries in the halal economy, such as logistics, ingredients, and retail. Some articles did not clearly infer any particular economic segment. These articles addressed topics on halal principles, for example, on brand (Wilson and Liu, 2010; Wilson and Grant, 2013), supply chain (Tieman, 2011) as well as and application of technologies in the halal context. This category also includes generic empirical studies (e.g. halal products) that do not specify their context (e.g. food) (Mukhtar and Butt, 2012). A number of articles were categorised under "lifestyle" (5%) that represent the lifestyle, social, and cultural facets of Muslims, which include dating, minorities' concerns, identity, politics, and Muslim spatiality. These findings indicate a central role for the halal food sector. However, it is necessary to broaden the scope of research into other economic sectors and explore untapped areas. This, together, shall help diversify the Islamic economy and further establish a halal market in the world's economic scene.

Table 15: Classifications of the articles based on sectors in Islamic Economy as categorized by the Global Islamic Economy Report (Dinar Standard, 2020)

Sector	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total	%
Cosmetics																	1	2	1	3	6	6	9	10	7	45	2.5
Fashion																							2	2		4	0.2
Finance		1						1			3	2	1	3	1	4	1	1		6	10	11	8	17	15	85	4.8
Food	1		1	2	2	3	4	6	6	3	6	8	13	19	13	40	76	86	89	93	105	125	169	166	109	1145	64.7
General													1	2	4	10	10		2	9	20	27	16	38	30	169	9.5
Health					1		1						2				1		1	1	2	5	1	7	9	31	1.8
Media/ Recreation*																											0.0
Multiple															1	3	1	2	2		2	3	3	3	3	23	1.3
Pharmaceutical														1	1		2	2	1	5	4	4	7	2	1	30	1.7
Travel		1													2	2	1	1	5	1	16	22	26	35	37	149	8.4
Lifestyle									1				1	2	2	8	4		6	12	6	9	9	15	14	89	5.0
Total	1	2	1	2	3	3	5	7	7	3	9	10	18	27	24	67	97	94	107	130	171	212	250	295	225	1770	100.0

5. CONCLUSION

In essence, there is a broad umbrella of halal research themes or topics that encompass and bridge several disciplines. The analysis of publication data from 1996 to 2020 revealed 10 research clusters with halal authentication being the largest cluster followed by halal market and marketing. Emerging research areas such as cosmetics, halal food supply chains, logistics, and halal tourism have also been identified. Islamic finance and banking (halal finance) were observed to be relevant fields in the halal ecosystem. Research areas can also be categorised based on either pure science or social science and humanities, with the latter forming the majority of work in recent years. Interestingly, it was observed that the halal research evolved from being only a pure science-based approach (e.g., halal authentication; slaughtering) to a broader insight, including social science and humanities approaches (e.g. halal certification, Islamic market).

This study, though broad in nature, is limited by the source of publication data, whereby only the Scopus database was used. Apart from other indexed databases, there are a substantial number of articles with halal research output that have been published in non-indexed journals, covering many areas, including the untapped areas (see below). It is notable that many of these non-indexed journals are new, and home grown, with considerably good publication standards but require some time to be matured and indexed in academically accepted systems.

Findings from this study can guide researchers in the halal field to enrich their existing research and explore new subjects that would have a real impact on halal and its industry. The findings are also useful for the funding bodies to identify commendable sectors to support, industry to collaborate with academia for translational sustainable halal research, and government agencies to develop relevant policies. The outcome of this work will also trigger journal publishers to be more receptive toward publishing halal-related research as its output is diverse and benefits various stakeholders.

This study identified several untapped areas that could be of interest for researchers to further delve into and contribute to the development of a halal body of knowledge while providing solutions to the halal sector. These areas include modest fashion, halal media and recreation, halal curriculum, halal science, and intellectual discourse on the interrelationship between halal practice and Islamic faith. Responding to the COVID-19 pandemic, technologies surrounding digitisation, big data, and the Internet of Things are

foreseen to be re-emerging as hot areas of research that could help provide solutions to the real-world needs of halal and its industry.

6.   ACKNOWLEDGMENT

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