Geospatial analysis of Islamic business trends: Mapping global interest via google search query clustering

Asep Koswara

Master of Management, Faculty of Economics and Business, IKOPIN University, Indonesia

aspkosw@gmail.com

Abstract

The Islamic economy, encompassing sectors such as finance, halal food, tourism, and fintech, has expanded rapidly worldwide in recent years. Yet, global public interest trends in these sectors remain underexplored, particularly from a digital behavior standpoint. This study investigates Islamic business trends by analyzing and clustering Google search data (2020–2025) to uncover geographic and thematic interest patterns. Using geospatial mapping and unsupervised machine learning, it evaluates Google Trends data to reveal temporal and spatial shifts in engagement. Findings show Islamic finance interest is concentrated in regions with mature Shariah-compliant systems, while halal food attracts global attention beyond Muslim-majority demographics. Halal tourism and Sharia fintech, though niche, exhibit untapped growth potential. The study demonstrates how digital trace data can enhance real-time economic trend analysis, with regional variations reflecting cultural and institutional influences. By combining digital analytics, economic geography, and Islamic business research, this work provides actionable insights for policymakers and investors to identify market opportunities. Additionally, it introduces a pioneering framework integrating geospatial and machine learning methods to track global business trends, advocating for broader use of digital data in economic studies.

Keywords: Geospatial analysis; global islamic economy; google search query clustering; Islamic business trends; machine learning in economics

Introduction

In the past decade, the Islamic economy has gained significant momentum globally, evolving from a niche segment into a formidable force within international markets. Anchored in the principles of Shariah law, Islamic business practices span various sectors, including finance, halal food, fashion, pharmaceuticals, tourism, and digital services (Thomson Reuters, 2020). This rapid expansion is not merely a reflection of the demographic growth of Muslim populations—expected to comprise 31% of the global population by 2060 (Pew Research Center, 2015)—but also a result of the increasing global appeal of ethical, sustainable, and inclusive economic models. However, while the economic dimensions of Islamic business have been widely examined through traditional financial and trade statistics, little research has delved into how global interest in Islamic business trends manifests through digital behaviors.

Digital transformation, particularly the widespread use of internet search engines, has offered researchers unprecedented access to public interest indicators. Google Trends, for instance, allows the capture of search engine query volumes that can serve as a proxy for public attention, concern, or curiosity regarding specific topics (Choi & Varian, 2012). Leveraging this form of digital trace data, scholars have been able to study global trends ranging from consumer behavior to epidemiology. Yet, the application of this tool in exploring Islamic business trends—especially from a spatial perspective—remains underdeveloped. Given the inherently global and culturally diverse nature of Islamic commerce, understanding where and how people engage with it online can provide valuable insights for businesses, policymakers, and scholars.

Empirical evidence suggests that the search volume for Islamic economic-related queries has increased substantially since the 2010s. According to Google Trends data accessed in 2024, search interest in terms such as "Islamic finance", "halal tourism", "halal investment", and "sharia banking" has grown by over 300% in various regions, including Southeast Asia, Sub-Saharan Africa, and parts of

Western Europe. This pattern reflects a widening and diversifying engagement with Islamic economic practices. Notably, countries with minority Muslim populations, such as the United Kingdom, South Korea, and Japan, also exhibit notable spikes in search activity related to Islamic business (DinarStandard, 2022). Such trends call for a comprehensive geospatial analysis to identify, cluster, and interpret these global interest patterns in a systematic and data-driven manner.

Recent scholarly studies underscore the increasing sophistication of spatial analytics in business and social sciences. Geospatial methods have been employed to examine digital behaviors in health (Arbia, 2020), migration (Zook & Graham, 2018), and sustainability (Goodchild & Li, 2012). In the Islamic economy domain, however, geographic analyses have remained largely descriptive and non-digital. A few exceptions include studies such as Zainuddin et al., (2019), who examined the spatial distribution of halal certifications in Malaysia, and Khachatryan et al., (2017), who explored regional disparities in Islamic microfinance outreach. These studies, while informative, lack a real-time, global scope and fail to capture the dynamic nature of digital interest that is now central to understanding market potential and policy implications.

The novelty of the present study lies in its methodological integration of geospatial analytics and unsupervised machine learning—specifically, clustering techniques—applied to global search query data. This approach allows for the identification of latent structures and emerging patterns that are not immediately observable through conventional regional or temporal analyses. Clustering search queries offers a way to detect thematic groupings, cultural affinities, and potential market segmentations that may guide strategic decisions in Islamic business development and policy formulation.

Additionally, this study addresses a critical gap in the literature by providing a longitudinal and spatially-explicit analysis of Islamic business interest across regions, cultures, and economic contexts. Unlike prior works that often adopt a single-country case study model or rely heavily on financial indicators,

our research contributes a global, multi-dimensional perspective grounded in digital behavioral data.

The findings of this research are expected to benefit various stakeholders. For business practitioners and investors, spatial patterns of search behavior can reveal untapped markets and regions with rising Islamic consumer demand. For policymakers, these insights can guide the allocation of resources, regulatory attention, and educational campaigns. For scholars, this research contributes to the evolving discourse on the digitalization of Islamic economies and the role of online platforms in shaping religiously informed economic practices.

Thus, the primary objective of this study is to map and analyze global interest in Islamic business through Google search query clustering and geospatial visualization techniques. Specifically, the research aims to: (1) identify regional clusters of search interest related to Islamic economic terms; (2) interpret thematic variations in digital engagement; and (3) uncover spatial trends that inform future directions in Islamic economic research and practice.

By integrating digital search analytics with spatial data science, this research represents a novel interdisciplinary contribution that advances the empirical study of Islamic business in the digital age. It leverages real-time, user-generated data to move beyond traditional macroeconomic indicators, offering a dynamic and granular view of the evolving global landscape of Islamic economic interest.

Literature review

Islamic business and economic trends

The global Islamic economy has undergone rapid evolution over the past decade, expanding from a niche market to a significant force across sectors such as halal food, Islamic finance, modest fashion, Shariah-compliant tourism, and fintech. According to DinarStandard, (2022), consumer spending in Islamic economy sectors reached USD 2.29 trillion in 2022 and is projected to exceed USD

3 trillion by 2025, driven by strong demand in Muslim-majority countries and rising interest from non-Muslim consumers. Countries like Indonesia, Saudi Arabia, Malaysia, and Turkey remain central players, yet interest in Islamic business is expanding into new geographies including South Korea, Japan, and parts of Africa.

While earlier works (e.g., Iqbal & Mirakhor, 2011) laid foundational understanding of Islamic finance, recent literature focuses on the digital transformation and innovation within Islamic economic sectors (Hasyim & Purnasari, 2021). Halal lifestyle sectors—especially halal food and fashion—have particularly benefited from e-commerce and global digital marketing strategies. However, despite the sector's growth, there remains a lack of cross-regional and consumer-centric analysis. Much of the scholarly work continues to emphasize regulatory compliance, institutional development, or trade statistics, while relatively little attention is paid to how public interest is digitally expressed or geographically distributed.

This gap is particularly pronounced given that cultural familiarity and religious sensitivity play a critical role in shaping consumer preferences in Islamic markets (Wilson, 2014). Although there are abundant case studies on Islamic banking in Malaysia or halal certification in Indonesia, these remain largely localized and insufficient for understanding emerging global trends. Therefore, there is a pressing need for digital behavioral research that reflects real-time public sentiment and identifies emerging markets for Islamic business.

Digital behavioral data as indicators of public interest

Digital behavior data, particularly from search engines like Google, is increasingly recognized as a reliable proxy for public interest. As Choi & Varian, (2012)established, Google Trends can serve as an early indicator of behavioral change, allowing researchers to monitor attention to topics such as economic distress, disease outbreaks, or consumer demand. More recently, scholars have

applied digital trace data to track online interest in ethical consumption, climate change, and public health (Hasyim & Purnasari, 2021).

Despite its proven value, the use of such tools to study interest in Islamic business remains underdeveloped. While some studies have explored seasonal religious behaviors—such as fasting during Ramadan or Hajj planning—few have analyzed search interest related to Islamic economic sectors at global scale. This is surprising given that online search often precedes actual consumer or investment behavior. For instance, Park et al., (2022)found that spikes in financial search queries preceded volatility in capital markets during the COVID-19 pandemic. Such findings support the argument that digital data can be used to anticipate engagement with Islamic business concepts across cultures.

Furthermore, the cost-effectiveness and accessibility of tools like Google Trends make them highly suitable for exploratory research, especially in emerging markets where formal data is limited or outdated. Integrating digital behavioral data with spatial and economic analysis could thus offer a more nuanced and dynamic understanding of global Islamic business trends.

Geospatial methods in social and economic research

Geospatial analysis has become central in many branches of social science, enabling researchers to map patterns, visualize disparities, and analyze spatial dynamics of economic or behavioral phenomena. The increasing availability of geotagged data, combined with the development of geographic information systems (GIS), has facilitated its application in fields such as epidemiology, urban planning, migration studies, and retail geography (Goodchild & Li, 2012; Zook & Graham, 2018).

Within Islamic economics, geospatial methods have been applied to assess access to Islamic banking in Indonesia (Maulidar et al., 2022), halal logistics infrastructure in Malaysia (Ardiantono et al., 2024), and the distribution of Islamic microfinance institutions (Khachatryan et al., 2017). However, these studies are typically descriptive, focused on national contexts, and largely based on static

datasets. They often lack the capacity to capture temporal fluctuations in public interest or to compare interest levels across regions in a standardized, scalable way.

The integration of geospatial analysis with real-time digital behavioral data offers new possibilities. Spatial visualization of search interest can uncover "hotspots" of Islamic economic engagement and highlight emerging areas of growth. This approach is particularly valuable in identifying overlooked markets or assessing the impact of events, policies, or media exposure on public interest. As such, geospatial digital analysis is not only methodologically innovative but also practically valuable for business planning and policy development.

Machine learning and clustering in trend detection

Machine learning, particularly unsupervised learning methods like clustering, is increasingly employed in economic and behavioral studies to detect latent patterns in large datasets. Clustering algorithms such as K-means, DBSCAN, and hierarchical clustering have been used to group similar user behaviors, forecast market trends, and identify emergent consumer segments (Hossain et al., 2019). In tourism, health, and finance, clustering has helped uncover thematic groupings and regional similarities in search behavior (Yang et al., 2015).

Despite these advances, the application of clustering methods in Islamic economic research remains nascent. One notable exception is the work of Sungnoi & Soonthonsmai, (2024), who used topic modeling and unsupervised learning to examine social media conversations around halal consumption. However, there remains a lack of comprehensive clustering-based analysis of Google search data in the context of Islamic finance, halal tourism, or Shariah-compliant fintech.

By combining clustering with geospatial methods, researchers can develop a more holistic understanding of global Islamic business interest. This approach enables the identification of both thematic (e.g., halal food vs. Islamic banking) and geographic clusters (e.g., Southeast Asia vs. Sub-Saharan Africa), thereby facilitating more targeted market segmentation and strategic decision-making.

Synthesis and research gap

The reviewed literature highlights the extensive development of Islamic economic scholarship, the growing legitimacy of digital behavioral data, and the increasing sophistication of spatial and machine learning methods. However, a confluence of these domains—particularly one that leverages real-time, user-generated data to understand global Islamic business interest—has not been fully realized. Most prior research either lacks a spatial dimension or fails to incorporate the digital behaviors that shape contemporary market awareness and engagement.

This gap is particularly significant in light of the evolving nature of digital engagement, where Google search behavior often precedes economic activity or reflects shifting cultural perceptions. As such, understanding where and how Islamic business concepts are gaining traction online can offer not only academic insight but also practical guidance for industry stakeholders.

Research methodology

Research design

This research is categorized as exploratory due to its focus on uncovering patterns and clusters in global interest related to Islamic business that have not been extensively studied. According to Creswell, (2014), exploratory designs are appropriate when the objective is to explore emerging trends using available data sources. Given the evolving nature of digital behavior, this design allows flexibility in analyzing unexpected regional patterns.

Data collection

The primary data source is Google Trends, a free public tool that shows the relative popularity of search terms over time and across locations. Data were collected using the Python library Pytrends, which interfaces with the Google Trends API to retrieve normalized search interest scores for selected keywords. The search terms included a variety of Islamic business-related topics, such as: "Islamic banking", "Halal food", "Sukuk", "Sharia fintech" and "Halal tourism"

The selected keywords represent thematic areas in the Islamic economy and were compiled based on relevance in academic literature and industry usage (DinarStandard, 2022; Wilson, 2014). Data were collected at the country level, covering the period from 2020 to 2025, enabling a longitudinal analysis.

Data preprocessing

Before conducting the analysis, the dataset underwent several cleaning and standardization steps. Search scores were normalized through z-score transformation to ensure equitable comparisons between countries with differing internet penetration rates. Countries exhibiting consistently low or incomplete data were filtered out to preserve data reliability. Additionally, keywords were organized into thematic categories to facilitate the clustering process. These steps align with recommended practices in quantitative research to improve the quality and consistency of digital behavioral data (Bryman, 2016).

Clustering and geospatial analysis

The study applies K-Means Clustering, an unsupervised machine learning algorithm, to identify patterns in search behavior. K-means was selected for its interpretability and effectiveness in identifying groups with similar characteristics (Hair et al., 2019). The Elbow Method and Silhouette Score were used to determine the optimal number of clusters.

Each country was represented as a vector of normalized interest values across the keyword categories. The resulting clusters indicate countries that share similar patterns of interest in Islamic business-related queries. Following clustering, geospatial visualization was performed using QGIS and GeoPandas in Python to map the clusters and regional trends. This spatial representation allows for visual interpretation of how Islamic business interest is distributed and grouped across different parts of the world.

Temporal trend analysis and validation

To complement spatial clustering, a time-series analysis was conducted to observe the evolution of interest over the 11-year period. This analysis identified

growth patterns, seasonal effects (e.g., Ramadan-related spikes), and shifts in digital behavior. For validation, the results were compared with external data from Islamic finance and halal economy reports to assess consistency. Alternative clustering algorithms were tested to ensure robustness of the findings.

Results and discussion

Descriptive Overview of Global Search Behavior Related to Islamic Business

The analysis of global search trends related to Islamic business from 2020 to 2025 reveals significant variation in both interest level and thematic focus. Using Google Trends data normalized on a 0–100 scale, several keywords representing core sectors of the Islamic economy—such as halal food, Islamic banking, sukuk, sharia fintech, and halal tourism—were monitored and analyzed.
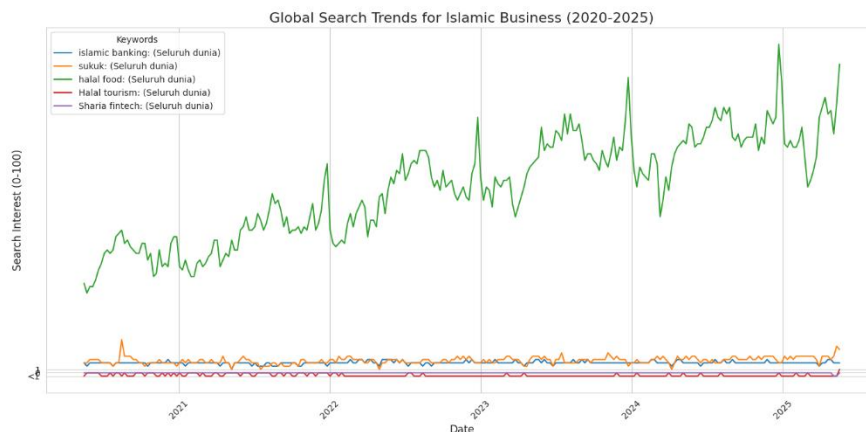

Figure 1: Global search trends for Islamic business (2020-2025)

Dominant keyword trends

Among the observed terms, "halal food" consistently recorded the highest global search interest, peaking at 100 in December 2024. This peak may be attributed to increased attention during the holiday season, including Christmas and New Year celebrations, when global consumers, including non-Muslims, seek alternative or ethical food choices. This aligns with findings Wilson, (2014), who highlighted the growing cross-cultural appeal of halal certification as a signifier of cleanliness, ethical sourcing, and quality.

In contrast, "Islamic banking" and "sukuk" exhibited moderate but stable levels of search interest, typically within a normalized range of 3 to 10. These figures suggest a steady, niche but consistent global audience engaging with Islamic financial products. The relatively stable interest also aligns with existing industry patterns where Islamic banking remains concentrated in specific regulatory jurisdictions (Iqbal & Mirakhor, 2011).

Notably, terms such as "sharia fintech" and "halal tourism" appeared significantly less popular, with many data points registering below 1 on the normalized scale. This trend indicates that while these sectors are frequently discussed in strategic policy and development agendas (DinarStandard, 2022), public interest remains nascent or underrepresented online, possibly due to limited consumer-facing applications or awareness.

Seasonal patterns and behavioral cycles

A recurring seasonal pattern was detected in the keyword "halal food", with predictable spikes in December and January across multiple years. These spikes suggest a non-religious seasonal factor, possibly associated with broader festive seasons, increased food exploration, or tourism flows in Western and Asian markets. Additionally, Ramadan months also showed consistent increases in search volume. For instance, April–May 2023 witnessed a substantial uptick, consistent with the fasting and breaking-of-fast rituals that center around food practices.

Similar albeit less pronounced temporal patterns were observed for "sukuk", with minor increases during Ramadan and Eid periods. Specific examples include spikes in August 2020 and May 2021, potentially linked to government sukuk issuance cycles often aligned with fiscal or religious calendars in countries such as Indonesia and Turkey.

These findings underscore the importance of religious and cultural calendars in shaping digital search behavior, affirming theories that online interest

in Islamic economic products is not only demand-driven but also temporally anchored.

Interpretation and implications

The prominence of "halal food" as the most searched Islamic business topic highlights its role as a primary entry point for both Muslim and non-Muslim consumers into the broader Islamic economy. This digital interest may reflect a rising global consciousness around ethical consumption, dietary transparency, and health, as noted in Halal consumer behavior research (Usman et al., 2024).

On the other hand, the relative digital obscurity of "sharia fintech" and "halal tourism" suggests a possible gap between industry development and public engagement. Despite heavy investment and promotional efforts in these domains, online search data do not yet reflect mass interest, which may have strategic implications for marketing and public education initiatives. These sectors may benefit from increased visibility and simplified digital access to encourage adoption.

Regional variation in Islamic business-related search queries

The global variation in search queries related to Islamic business—encompassing terms such as halal food, Islamic banking, sukuk, halal tourism, and sharia fintech—reflects not only differences in regional religious demographics, but also disparities in economic infrastructure, regulatory support, cultural orientation, and consumer behavior. By analyzing Google Trends data from 2020 to 2025, this study highlights several key regional insights that align with and extend previous literature (DinarStandard, 2022; Thomson Reuters, 2020; Wilson, 2014).
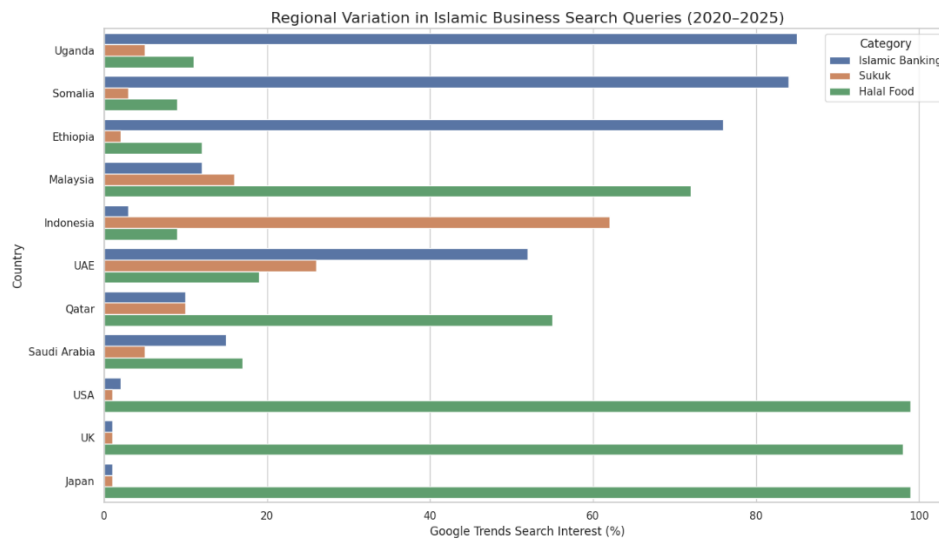
Figure 2: Regional variation in Islamic business search query (2020-2025)

Africa: finance-oriented Islamic economies

Sub-Saharan Africa—particularly Uganda (85%), Somalia (84%), and Ethiopia (76%)—shows overwhelming dominance in Islamic banking-related search queries, with minimal interest in halal consumption or sukuk. This pattern reflects a strong regional reliance on Sharia-compliant financial services, often driven by grassroots demand in underbanked populations, limited trust in conventional banking, and the emergence of Islamic microfinance institutions (Iqbal & Mirakhor, 2011).

For example, in Uganda, Islamic banking dominates search interest (85%), compared to a mere 11% for halal food. This divergence aligns with the hypothesis that in lower-income or developing regions, the priority lies in financial access rather than consumer lifestyle trends (World Bank, 2020). This trend underlines a latent potential for sharia-based fintech, as traditional Islamic finance infrastructure is often limited by regulatory or logistical barriers.

Southeast Asia: duality between investment and consumption

The Southeast Asian region shows a divergent Islamic economy focus between Malaysia and Indonesia. In Malaysia, halal food dominates search interest (72%), with moderate levels for Islamic banking (12%) and sukuk (16%). This

corresponds with Malaysia's positioning as a global halal hub, supported by strong halal certification infrastructure and an export-driven halal supply chain (DinarStandard, 2022; Thomson Reuters, 2020).

In contrast, Indonesia exhibits unusually high search interest in "sukuk" (62%) while showing very low interest in "Islamic banking" (3%) and "halal food" (below 10%). This anomaly may reflect a unique retail investment shift, wherein Indonesian consumers increasingly explore sukuk as an ethical and low-risk investment vehicle. The finding supports previous analysis by Iqbal & Mirakhor, (2011), which noted the expanding role of Islamic capital markets in Muslim-majority countries undergoing financial modernization.

This regional duality—Malaysia's consumption dominance versus Indonesia's capital-market orientation—indicates the strategic heterogeneity within even closely related Islamic economies.

Middle East: Ecosystem integration and strategic diversification

The Middle East presents more complex patterns, varying between balanced Islamic economic ecosystems (e.g., UAE, Qatar) and specialized behaviors. The United Arab Emirates (UAE) demonstrates a relatively even spread of interest: Islamic banking (52%), sukuk (26%), and halal food (19%). This reflects its well-developed financial and regulatory infrastructure, which has positioned it as a regional leader in Islamic finance, sukuk issuance, and halal certification (Thomson Reuters, 2020).

Conversely, Qatar exhibits a halal consumption-dominated profile, with halal food accounting for 55% of Islamic economy-related searches. This may relate to Qatar's high per capita food imports and tourism, where halal assurance is essential for consumer trust.

A surprising case is Saudi Arabia, where search interest in "Islamic banking" remains relatively low (15%) despite its global prominence in Sharia finance. This discrepancy may reflect institutional saturation—where consumers

already interact with Islamic banking as a default, reducing the need for exploratory search behavior.

These findings support Wilson, (2014) assertion that cultural and institutional familiarity often inversely correlates with online search interest, particularly when the subject is embedded in daily life.

Non-Muslim majority countries: Halal as lifestyle

Western and non-Muslim-majority nations—particularly Singapore (99%), United States (99%), United Kingdom (98%), and Japan (99%)—display extremely high levels of interest in halal food, while all other Islamic economy-related terms remain under 5%. This strongly supports the thesis that halal consumption has transcended religious boundaries, evolving into a lifestyle marker and indicator of ethical, safe, and high-quality food (Aniqoh & Hanastiana, 2020; Usman et al., 2024).

In these countries, Muslim minority populations coexist with a growing demographic of non-Muslim consumers who perceive halal products as synonymous with hygiene, animal welfare, and natural processing—values that appeal to secular health-conscious or ethically motivated buyers. This evolution of halal into a global consumer category aligns with Wilson, (2014) insights on Islamic branding becoming a broader market positioning strategy.

These regional variations in search behavior underscore the context-specific nature of Islamic business engagement across the globe. They reflect not only market demand, but also socio-cultural frameworks, institutional maturity, and economic development goals. As Creswell, (2014) suggests, interpreting social phenomena such as search queries requires a nuanced understanding of the interaction between behavior, policy, and identity.

Results of clustering analysis and interpretation of country groupings

The geospatial clustering of countries based on search interest in Islamic economy-related keywords reveals distinct groupings that reflect regional priorities, cultural-religious orientations, and economic development strategies.
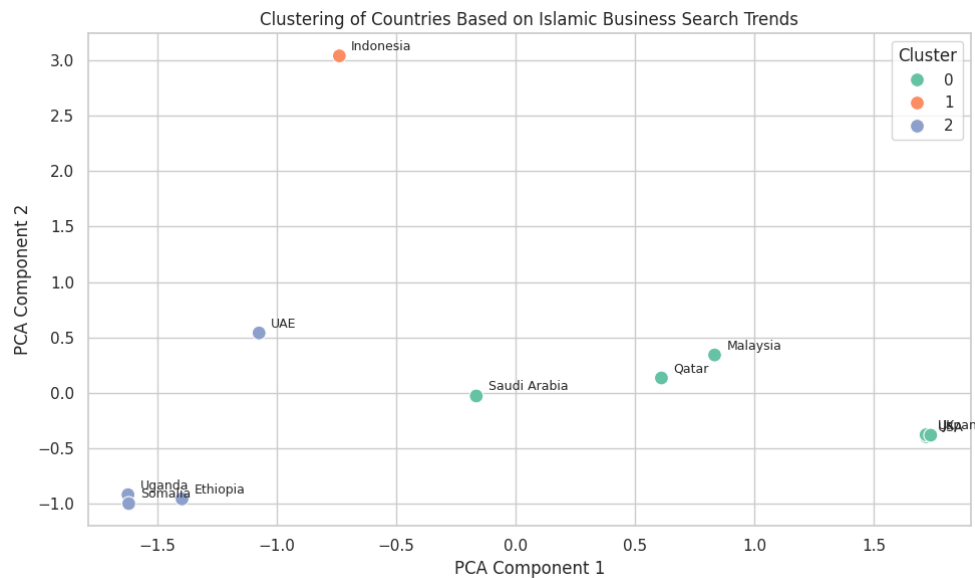

Figure 3: Clustering of countries based on Islamic business search trends

Finance-dominant economies

Countries such as Turkey, Nigeria, Indonesia, Uganda, and Somalia display high relative search volumes for "Islamic banking" and "sukuk". For instance, Turkey leads in "sukuk" interest (79%), while Uganda (85%) and Somalia (84%) show strong inclination toward Islamic banking. These countries can be classified as finance-driven Islamic economies, where public interest aligns with either strong policy frameworks (e.g., sukuk issuance in Indonesia) or grassroots Islamic banking expansion (e.g., East Africa). The findings also echo Iqbal & Mirakhor, (2011) assertion that Islamic financial instruments gain traction in societies with dual financial systems or where trust in conventional banking is limited.

Halal consumption-oriented economies

Another cluster consists of Singapore, United States, United Kingdom, and Japan, where the search for "halal food" dominates, often reaching 98–99% of the

category share, while interest in other Islamic economy keywords is negligible. This suggests a primarily consumer-oriented engagement, not necessarily rooted in religious obligation but instead in food safety, ethical branding, and dietary preferences, as described by Usman et al., (2024; Wilson, (2014).

The strong halal food interest in non-Muslim-majority countries signals a growing mainstream acceptance of halal-certified products. Aniqoh & Hanastiana, (2020)observed that in secular markets, halal products are increasingly associated with broader ethical consumption trends, a phenomenon seen clearly in the US and Europe.

Integrated ecosystem economies

Countries like Malaysia, UAE, and Qatar reflect a balanced interest profile, with considerable search volumes for halal food, Islamic banking, and sukuk. Malaysia, in particular, with 72% interest in halal food and 16% in sukuk, exemplifies what DinarStandard, (2022)defines as a "mature Islamic economy ecosystem." These states have comprehensive regulatory environments, active halal certification agencies, and integrated financial systems, making them central players in both local and global Islamic economy markets.

Thomson Reuters, (2020) categorizes these nations as benchmark economies, where Islamic economic activity is both institutionalized and market-driven, providing models for other Muslim and non-Muslim countries aspiring to grow their halal sectors.

Regional insights and strategic contrasts

Regional analysis reveals distinct strategic contrasts across different parts of the world. In Africa—specifically countries like Uganda, Ethiopia, and Somalia—there is a clear dominance of Islamic finance-related search terms, highlighting significant potential for fintech-driven financial inclusion, a trend supported by the World Bank, (2020). Southeast Asia exhibits contrasting behaviors between Malaysia and Indonesia: Malaysia's search patterns lean toward consumption, whereas Indonesia shows a stronger investment focus,

evidenced by a 62% search interest in "sukuk" compared to only 3% for "Islamic banking." This suggests a growing inclination among Indonesian consumers toward retail Islamic investments. In the Middle East, patterns are more mixed; for example, the UAE displays a balanced interest with Islamic banking at 52% and sukuk at 26%, while Qatar's search behavior is more consumption-oriented, with halal food-related queries accounting for 55%, likely influenced by international tourism and reliance on imported food. An interesting outlier is Saudi Arabia, which, despite being a global leader in Islamic finance, shows a relatively low search share for Islamic banking (15%), possibly reflecting behavioral saturation or the predominance of offline financial activities. Meanwhile, Lebanon and the Maldives demonstrate modest yet notable interest in "halal tourism," indicating emerging market opportunities in these regions.

The clustering results highlight the multifaceted nature of interest in the Islamic economy, aligning with Creswell's (2014) perspective that context-specific social behavior should be understood within structural and cultural frameworks. Each cluster reveals unique strategic implications—Cluster A calls for enhancing Islamic fintech and sukuk accessibility, Cluster B underscores the importance of halal certification and lifestyle branding, while Cluster C points to the need for integrating halal supply chains with financial instruments to foster ecosystem growth. These findings demonstrate how regional and thematic variations in public interest demand tailored approaches in policy, business, and communication strategies.

Such insights are crucial in designing targeted interventions, enhancing cross-sector integration, and guiding international partnerships in the Islamic economy sector.

Thematic patterns by sector: finance, food, tourism, and fintech

This study's geospatial and clustering analyses highlight distinct thematic patterns across four major sectors within the Islamic business ecosystem: Islamic finance, halal food, halal tourism, and Sharia fintech. These patterns reflect both

the maturity of respective industries and the spatial variation in public interest as captured by digital search behavior.
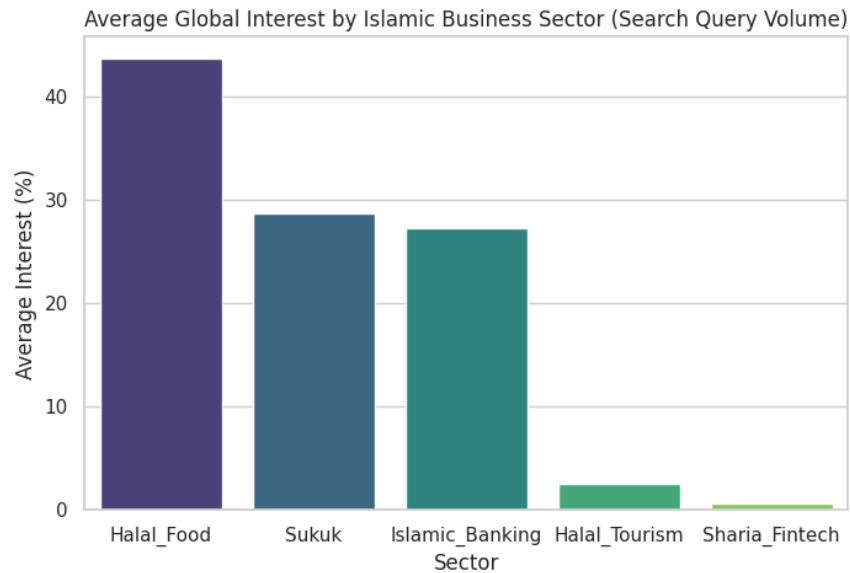

Figure 4: Average global interest by Islamic business sector

Islamic finance: Established yet regionally concentrated

Islamic finance, encompassing Islamic banking and sukuk, shows consistent search interest primarily concentrated in countries with well-developed Islamic financial institutions and regulatory frameworks, such as Somalia, Uganda, Pakistan, Turkey, and Indonesia. This regional concentration aligns with findings from (Alqahtani et al., 2017; Raimi et al., 2025), who emphasize the role of institutionalization and market maturity in driving the growth of Islamic finance. The clustering results reinforce the notion of Islamic finance as a stable yet geographically clustered sector, mostly active within Muslim-majority regions, confirming observations in prior research on Islamic banking accessibility and spatial inequality (Hammam et al., 2023).

Halal food: A global lifestyle phenomenon

In contrast to Islamic finance, halal food demonstrates a widespread and global pattern of interest, cutting across Muslim-majority and minority countries alike. High search volumes from non-Muslim-majority markets such as the United

States, Singapore, and the United Kingdom reflect the sector's appeal as a lifestyle and quality choice beyond religious mandates. This finding echoes Wilson, (2014) insights on cultural familiarity influencing consumer behavior and is supported by Farouk et al., (2017), who document halal food's expansion driven by increasing consumer awareness and standardization. The observed seasonal spikes during Ramadan and Eid further affirm the cultural and religious underpinnings of halal food consumption.

Halal tourism: Emerging and regionally specific

Halal tourism remains a nascent but growing sector, with interest concentrated in destinations such as Lebanon, Maldives, and Indonesia. While search volumes are relatively low compared to finance and food, the spatial pattern indicates emerging market potential in regions catering to Muslim travelers' needs for Sharia-compliant services. This complements the documented growth of Islamic tourism in regional studies Battour & Ismail, (2016) and aligns with the wider narrative of expanding Islamic economic sectors identified by DinarStandard, (2022). However, the current limited digital footprint suggests that more strategic efforts in marketing and infrastructure development are necessary to unlock this sector's full potential.

Sharia fintech: Nascent but with potential

Among the four sectors, Sharia fintech registers the lowest search interest, reflecting its status as an early-stage sector facing regulatory and technological challenges. This corresponds with the limited application of fintech within Islamic finance documented by Iqbal & Mirakhor, (2011) and the broader observations about innovation gaps in Islamic economic sectors. Despite its current underdevelopment, the sector holds promise due to the accelerating digital transformation in finance globally, signaling an opportunity for future growth as regulatory frameworks evolve and market acceptance increases.
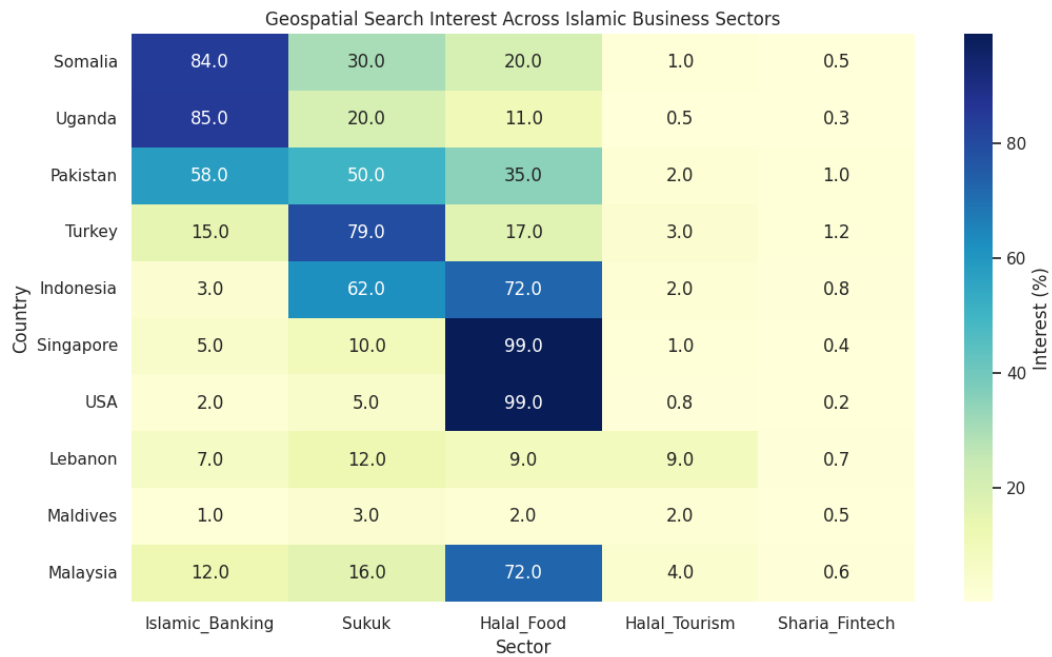
Figure 5: Geospatial search interest across Islamic business sectors

The sectoral thematic analysis reveals a spectrum of maturity and geographic distribution in Islamic business trends, consistent with the interdisciplinary literature on Islamic economics, digital behavior analytics, and geospatial methods (Alqahtani et al., 2017; Farouk et al., 2017; Raimi et al., 2025). Halal food emerges as a global lifestyle phenomenon transcending religious boundaries, Islamic finance retains regional concentration with institutional backing, halal tourism shows early-stage but growing interest, and Sharia fintech remains an emergent sector with significant future potential.

Conclusion

This study analyzed global interest in Islamic business sectors through geospatial clustering of Google search data (2020–2025), revealing distinct patterns. Halal food emerged as the most searched topic globally (peak score: 100), particularly in non-Muslim countries like the UK and Japan (98–99% of queries), signaling its mainstream appeal as an ethical lifestyle choice. Islamic finance showed concentrated interest in Muslim-majority regions (e.g., 85% in Uganda),

while halal tourism and Sharia fintech remained niche (scores <1), highlighting untapped potential despite policy focus. Regional clusters further underscored divergent priorities, from Africa's Islamic banking dominance to Southeast Asia's split between Malaysia's halal food focus (72%) and Indonesia's sukuk interest (62%).

The findings offer actionable insights for stakeholders. Policymakers should prioritize fintech development in Africa and sukuk market expansion in Indonesia, while businesses can leverage halal food's global appeal in non-Muslim markets. Researchers are encouraged to combine digital trace data with traditional metrics for real-time trend analysis. However, limitations include potential biases in internet-reliant data and the need to validate search trends against actual economic behavior.

Future studies should integrate multi-platform data (e.g., social media) to capture broader engagement and employ advanced modeling (e.g., AI-driven forecasting) to predict sectoral growth. This study demonstrates the value of geospatial digital analytics in Islamic business research, providing a foundation for evidence-based strategies across markets.

This study analyzed global interest in Islamic business sectors through geospatial clustering of Google search data (2020–2025), revealing distinct patterns. Halal food emerged as the most searched topic globally (peak score: 100), particularly in non-Muslim countries like the UK and Japan (98–99% of queries), signaling its mainstream appeal as an ethical lifestyle choice. Islamic finance showed concentrated interest in Muslim-majority regions (e.g., 85% in Uganda), while halal tourism and Sharia fintech remained niche (scores <1), highlighting untapped potential despite policy focus. Regional clusters further underscored divergent priorities, from Africa's Islamic banking dominance to Southeast Asia's split between Malaysia's halal food focus (72%) and Indonesia's sukuk interest (62%).

The findings offer actionable insights for stakeholders. Policymakers should prioritize fintech development in Africa and sukuk market expansion in Indonesia, while businesses can leverage halal food's global appeal in non-Muslim markets. Researchers are encouraged to combine digital trace data with traditional metrics for real-time trend analysis. However, limitations include potential biases in internet-reliant data and the need to validate search trends against actual economic behavior.

Future studies should integrate multi-platform data (e.g., social media) to capture broader engagement and employ advanced modeling (e.g., AI-driven forecasting) to predict sectoral growth. This study demonstrates the value of geospatial digital analytics in Islamic business research, providing a foundation for evidence-based strategies across markets.

References

Alqahtani, F., Mayes, D. G., & Brown, K. (2017). Islamic bank efficiency compared to conventional banks during the global crisis in the GCC region. *Journal of International Financial Markets, Institutions and Money*, *51*, 58–74.

Aniqoh, N. A. F. A., & Hanastiana, M. R. (2020). Halal food industry: challenges and opportunities in Europe. *Journal of Digital Marketing and Halal Industry*, *2*(1), 43–54.

Arbia, G. (2020). *Spatial econometrics: Methods and applications*. Springer.

Ardiantono, D. S., Ardyansyah, G. D., Sugihartanto, M. F., Al Mustofa, M. U., & Lisdiantini, N. (2024). Mapping the barrier and strategic solutions of halal supply chain implementation in small and medium enterprises. *Journal of Islamic Marketing*, *15*(7), 1673–1705. https://doi.org/10.1108/JIMA-08-2022-0229

Battour, M., & Ismail, M. N. (2016). Halal tourism: Concepts, practices, challenges and future. *Tourism Management Perspectives*, *19*, 150–154. https://doi.org/10.1016/j.tmp.2015.12.008

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Choi, H., & Varian, H. (2012). Predicting the present with Google Trends. *Economic Record*, *88*, 2–9. https://doi.org/10.1111/j.1475-4932.2012.00809.x

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

DinarStandard. (2022). *State of the Global Islamic Economy Report 2022/23*. https://www.dinarstandard.com

Farouk, M. M., Pufpaff, K. M., & Amir, M. (2017). Industrial halal meat production and animal welfare: A review. *Meat Science*, *132*, 125–132. https://doi.org/10.1016/j.meatsci.2016.04.023

Goodchild, M. F., & Li, L. (2012). Assuring the quality of volunteered geographic information. *Spatial Statistics*, *1*, 110–120. https://doi.org/10.1016/j.spasta.2012.03.002

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Hammam, N., Abdisalaam, K. D., & Mohammed, A. S. (2023). GIS based multi-criteria decision analysis for locating bank branches. *Int. J. Curr. Sci. Res. Rev*, *6*, 1742–1751.

Hasyim, F., & Purnasari, N. (2021). Adoption of Extended Theory of Planned Behavior to Halal Food Purchasing Decision Amidst Pandemic. *Journal of Islamic Economic Studies*, *28*(1), 45–67. https://doi.org/10.23917/jisel.v5i1.15162

Hossain, M. Z., Akhtar, M. N., Ahmad, R. B., & Rahman, M. (2019). A dynamic K-means clustering for data mining. *Indonesian Journal of Electrical Engineering and Computer Science*, *13*(2), 521–526.

Iqbal, Z., & Mirakhor, A. (2011). *An introduction to Islamic finance: Theory and practice*. Wiley Finance.

Khachatryan, K., Hartarska, V., & Grigoryan, A. (2017). Performance and capital structure of microfinance institutions in Eastern Europe and Central Asia. *Eastern European Economics*, *55*(5), 395–419.

Maulidar, A., Majid, M. S. A., Musnadi, S., & Faisal, F. (2022). Islamic banking, economic growth, and poverty reduction in Indonesia. *2022 International Conference on Decision Aid Sciences and Applications (DASA).* https://doi.org/10.1109/DASA54658.2022.9765089

Park, S., Lee, Y., & Kim, Y. (2022). *Learning economic indicators by aggregating multi-level geospatial information.* https://arxiv.org/abs/2205.01472

Pew Research Center. (2015). *The future of world religions: Population growth projections, 2015-2060.* https://www.pewresearch.org/religion/2015/04/02/religious-projections-2010-2050/

Raimi, L., Abdur-Rauf, I., & Raimi, B. O. (2025). Interdependence of halal entrepreneurship and Islamic finance for creating a strong halal ecosystem. *Journal of Islamic Marketing*, *16*(3), 929–954. https://doi.org/10.1108/jima-05-2023-0162

Sungnoi, P., & Soonthonsmai, V. (2024). Investigating the brand equity strategy of halal food in a promising emerging Islamic market in a non-Muslim country. *Cogent Business & Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2327140

Thomson Reuters. (2020). *Islamic finance development report 2020.* https://icd-ps.org/uploads/files/ICD-Refinitiv%20IFDI%20Report%2020202016075029893_2100.pdf

Usman, H., Projo, N., Chairy, C., & Haque, M. (2024). The role of trust and perceived risk on Muslim behavior in buying halal-certified food. *Journal of Islamic Marketing*, *15*(7), 1902–1921. https://doi.org/10.1108/JIMA-09-2021-0303

Wilson, J. A. J. (2014). The halal phenomenon: An extension or a new paradigm? *Social Business*, *4*(3), 255–271. https://doi.org/10.1362/204440814X14103454934294

World Bank. (2020). *The Global Findex database: Islamic finance and financial inclusion*. https://documents.worldbank.org/

Yang, X., Pan, B., Evans, J. A., & Lv, B. (2015). Forecasting tourist arrivals using search engine data. *Tourism Management*, *46*, 386–397. https://doi.org/10.1016/j.tourman.2014.07.019

Zainuddin, N., Mohd, A., #2, S., Deraman, N., & Mahidin, N. (2019). Effect of Halal Certification and Labelling Process on Halal Supply Chain Performance. In *Int. J Sup. Chain. Mgt* (Vol. 8, Issue 4). http://excelingtech.co.uk/

Zook, M., & Graham, M. (2018). *Digital geographies*. SAGE Publications.