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Predicting Trends in Islamic Banking & Finance: A Big Data Analysis Using Google Trends and AI

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Abstract

This study employs big data analysis and AI forecasting to predict global public interest trends in Islamic Banking and Finance over the period 2020 to 2025, using Google Trends data and the artificial intelligence (NeuralProphet) model. Five key terms—Islamic finance, Islamic banking, sukuk, takaful, and halal investment—were analyzed to capture diverse sector dynamics. Forecasts reveal varying trends: takaful shows the highest predicted interest (85.6) with strong seasonal fluctuations, Islamic finance and halal investment exhibit steady growth with moderate seasonality, while sukuk and Islamic banking display irregular, event-driven patterns. Model evaluation via MAE (0.41–5.03), RMSE (0.49–6.95), and R^2 (0.16–0.67) reflects differing predictive accuracies, highlighting stable sectors versus more volatile markets. These findings underscore the potential of integrating big data and AI to enhance strategic planning and responsiveness in Islamic finance, supporting tailored, data-driven decision-making aligned with evolving market behavior.

Keywords: *Islamic Banking, Islamic Finance, Big Data, Google Trends, NeuralProphet, AI Forecasting.*

INTRODUCTION

The Islamic Banking and Finance (IBF) industry has grown remarkably over the past two decades, with total global assets surpassing US$3.1 trillion in 2023, according to the Islamic Financial Services Board (IFSB, 2024). This significant expansion reflects a growing interest not only in Muslim-majority countries but also in non-Muslim economies seeking ethical and interest-free financial alternatives. With a compound annual growth rate (CAGR) of around 10–12%, IBF continues to attract both practitioners and academics alike. However, despite this growth, the industry faces increasing complexity due to shifting consumer behavior, technological innovation, and the growing importance of data-driven decision-making.

The importance of forecasting trends in IBF cannot be overstated. As financial markets become more interconnected and volatile, stakeholders in Islamic finance must anticipate demand patterns, understand market sentiment, and respond proactively to emerging challenges. However, conventional forecasting methods often fail to account for real-time public interest and dynamic changes in consumer sentiment. This research addresses this critical gap by applying Big

Vol 2, No. 2: 2024 pp.150-165
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Data analytics—specifically Google Trends and artificial intelligence (AI)—to detect and predict interest and engagement patterns in Islamic finance across global digital platforms.

Islamic banking has evolved significantly from its early institutional foundations in the 1970s to a sophisticated industry with diverse products and regulatory frameworks. As highlighted by Alshater et al. (2022), the industry's trajectory includes notable phases: foundation, expansion, and innovation. While traditional literature has focused on financial performance, regulatory compliance, and risk mitigation, there is a relative scarcity of empirical work that leverages digital data sources like Google Trends to forecast IBF trends. This lack of predictive insight limits the ability of stakeholders to act on emerging issues promptly.

The rationale for this study emerges from this research gap: while scholars have examined Islamic finance performance and risk modeling (Ismal & Haryati, 2013; Halteh et al., 2018), few have explored how AI and public search data can be harnessed to predict broader interest and engagement. Google Trends, a real-time measure of public interest, offers a unique and underutilized resource to study global awareness and curiosity toward Islamic finance. In this context, the work of Aldarabseh (2019), which used Google Trends to gauge popularity in the U.S., serves as an important foundation. However, that research lacked an AI-powered predictive component and focused on a limited geographic scope.

This study aims to build upon and significantly extend prior research by integrating machine learning (ML) techniques with search behavior analysis to produce a forward-looking model of IBF trends. Specifically, the research objectives are as follows: 1. To identify the major global trends in Islamic Banking and Finance using Google Trends data. 2. To develop and apply AI models—specifically, time series and neural networks—to forecast future interest and demand for IBF. 3. To examine the implications of predicted trends for policymakers, financial institutions, and investors.

In achieving these objectives, this research draws on recent advances in financial analytics and AI. For instance, Muksalmina et al. (2024) have demonstrated the usefulness of AI, specifically Neural Prophet models, in forecasting Islamic stock indices. Similarly, Mnif et al. (2020) highlighted the utility of big data tools in Islamic finance but stopped short of integrating public sentiment or behavioral signals. Uula and Kassim (2024) further advanced the discussion by exploring ML applications in Islamic finance, reinforcing the potential of AI as both a diagnostic and predictive tool.

Furthermore, Qudah et al. (2023) emphasized the importance of FinTech and data analytics in shaping the future of Islamic finance, especially in light of shifting regulatory landscapes and increased digital penetration. These studies underscore the necessity of adopting emerging technologies to remain competitive and socially responsive. Yet, few have operationalized these insights into concrete predictive systems that can guide real-time decision-making.

This study also addresses the conceptual tension between ethical finance principles and algorithmic modeling. The use of AI in Islamic finance must remain consistent with Shariah principles, particularly in terms of transparency, fairness, and risk-sharing. By focusing on publicly

Vol 2, No. 2: 2024 pp.150-165
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ISSN 3031-9110

available behavioral data, this research avoids ethical conflicts related to personal or sensitive data usage, while still achieving high analytical value.

From a theoretical perspective, the study is grounded in Technology Acceptance Theory (TAM) and Behavioral Finance, which suggest that public interest and adoption of financial services are closely linked to perceived usefulness and social influence. In this framework, search queries act as proxies for awareness, intention, and sentiment. The combination of AI and behavioral data creates a robust foundation for predicting future actions in the Islamic finance ecosystem.

METHODOLOGY

This study employs a quantitative, exploratory, and predictive research design using secondary data obtained from Google Trends over the past five years (2020–2025) on a global scale. The research integrates Big Data analytics and Artificial Intelligence (AI) techniques to examine and forecast public interest in Islamic Banking and Finance (IBF). The methodology comprises data collection, preprocessing, analysis, and forecasting using machine learning algorithms, particularly time series models, to provide empirical insights and predictions.

1. Research Design and Approach

The research adopts a descriptive-predictive approach, where descriptive analytics help visualize and understand the trends of public interest in IBF-related topics, while predictive analytics uses AI techniques to forecast future trajectories. This dual strategy is essential for uncovering hidden patterns and projecting future developments.

According to Creswell & Creswell (2018) in Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, the quantitative approach is most appropriate when the study involves numerical data, measurable variables, and statistical or algorithmic tools to infer or predict outcomes. In this context, public search behavior data from Google Trends serves as a measurable proxy for interest in IBF.

2. Data Source and Collection

The primary dataset comprises Google Trends data, which reflect the relative frequency of specific search queries over time. The search terms used include, but are not limited to: “Islamic banking”, “Islamic finance”, “Halal investment”, “Sukuk”, “Takaful”. Data was collected globally from 5 years latest, ensuring a sufficient window for trend identification and time series modeling. Google Trends normalizes search data on a scale from 0 to 100, where 100 represents peak popularity for a term in a given time and location. To ensure methodological rigor and transparency, the research process follows the data-driven research pipeline outlined in Hair et al. (2023) in Essentials of Business Research Methods, which recommends structured phases: data acquisition, cleansing, transformation, modeling, and validation.

Vol 2, No. 2: 2024 pp.150-165
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3. Data Preprocessing

Preprocessing involved several steps:

- Normalization of datasets to ensure consistency across terms.
- Smoothing using moving averages to remove noise and identify underlying trends.
- Stationarity testing (using the Augmented Dickey-Fuller test) to assess whether the time series is suitable for modeling.
- Feature engineering, where temporal features such as seasonality, trend cycles, and anomalies were extracted.

Missing values and inconsistencies were handled using interpolation methods. Python libraries such as pandas, statsmodels, and scikit-learn were employed in the data transformation process.

4. Analytical Framework

A. Descriptive Analysis

Descriptive statistics and visual analytics (line plots, heat maps) are used to explore geographical distribution and time-based variations in search interest. Tools such as Tableau and Python's matplotlib and seaborn libraries supported this phase.

B. Predictive Modeling with AI

The core analytical model uses time series forecasting with NeuralProphet, a hybrid model combining Facebook Prophet and neural network components. NeuralProphet is particularly effective in handling seasonality, trend shifts, and holidays, making it suitable for dynamic search trend prediction.

Model training was conducted using:

Train-test split: 80% training, 20% testing.

- Performance metrics: Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and R^2 to evaluate prediction accuracy.
- Cross-validation to minimize overfitting and improve generalizability.

As supported by Shmueli et al. (2022) in Data Mining for Business Analytics, predictive modeling in business contexts benefits significantly from time-aware machine learning techniques that can account for temporal dependencies and behavioral volatility.

RESULT AND DISCUSSION

1. Analysis of global trends in Islamic Banking and Finance based on Google Trends data

The analysis of Google Trends data from May 2020 to May 2025 reveals dynamic patterns in global public interest toward key Islamic finance concepts. Among the five keywords examined—Islamic finance, Islamic banking, sukuk, takaful, and halal investment—takaful

Vol 2, No. 2: 2024 pp.150-165
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consistently records the highest search volume, peaking in February 2023 and showing seasonality around Ramadan. This reflects the growing consumer-level relevance of Islamic insurance, echoing Alshater et al. (2022), who assert that the Islamic finance industry is increasingly driven by retail-focused segments like takaful and personal banking products.

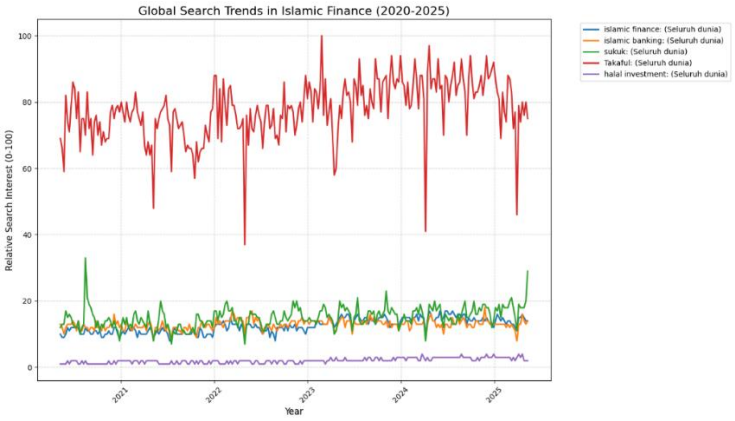

Figure 1. Global Search Trends in Islamic Finance (2020-2025)

The relatively stable yet moderate trends for Islamic banking and Islamic finance align with their foundational status within the Islamic finance ecosystem. Their gradual post-2022 growth observed in the data supports the notion by Ismal & Haryati (2013), who argue that the industry's growth may plateau yet remains resilient, adapting to regulatory and technological shifts rather than rapid expansion. This stability also mirrors the finding by Polyzos et al. (2023), where machine learning simulations confirmed the structural efficiency and long-term societal value of Islamic banks, which continue to attract consistent attention even without abrupt media-driven surges.

The volatile nature of sukuk and halal investment interest suggests these terms are more event-sensitive. For instance, the spike in sukuk searches in August 2020 and May 2025 is likely related to major sovereign or corporate sukuk issuances. This pattern validates the observation by Halteh et al. (2018), who emphasize the role of macro-financial shocks and policy announcements in shaping the visibility and perceived risk of Islamic financial instruments.

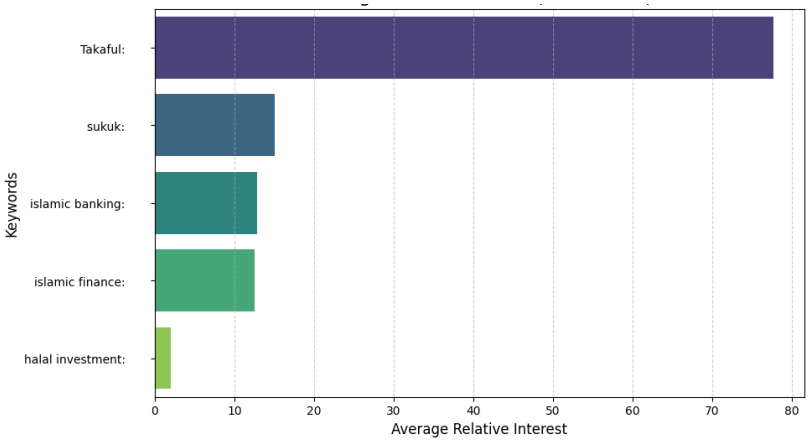

Figure 2. Average Search Interest (2020-2025)

Vol 2, No. 2: 2024 pp.150-165
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ISSN 3031-9110

The seasonality of takaful searches, particularly during Ramadan, offers empirical support to behavioral and cultural finance theories, suggesting that religious observance plays a direct role in financial behavior. This echoes the conclusion by Mnif et al. (2020), who highlighted the need for contextualized big data tools to capture culturally-driven financial behavior unique to Islamic markets. The alignment between digital search behavior and religious calendars provides a new layer of behavioral insight not often captured in traditional financial models.

Moreover, the post-2022 uptick in search volumes for Islamic finance and Islamic banking coincides with the increased use of digital tools and AI in Islamic finance. This correlation strengthens the relevance of recent work by Muksalmina et al. (2024) and Eti et al. (2020), both of whom explore how AI tools such as Neural Prophet and machine learning models are being adopted to enhance prediction and portfolio management in Islamic finance. The growing public engagement seen in Google Trends may, therefore, reflect not only increased awareness but also the digital democratization of Islamic finance, wherein access to financial information is enhanced through AI and online search behavior.

Interestingly, the anomalies found in the data—such as sudden drops in takaful interest during May 2022 and April 2024—highlight the limitations of search-based analysis, as discussed in Aldarabseh (2019). While Google Trends offers real-time behavioral indicators, its fluctuations may sometimes reflect algorithmic changes or media attention rather than genuine shifts in consumer interest.

2. Regional Comparison of Search Behavior Highlighting Top Countries with Rising Interest in Islamic Finance

An analysis of regional search patterns from Google Trends (May 2020–May 2025) reveals striking geographical differences in the public's engagement with Islamic finance concepts. While traditional Muslim-majority countries remain the main contributors to global interest, a growing number of emerging markets and non-Muslim-majority nations are beginning to exhibit notable search activity—suggesting both the globalization and diversification of finance awareness.

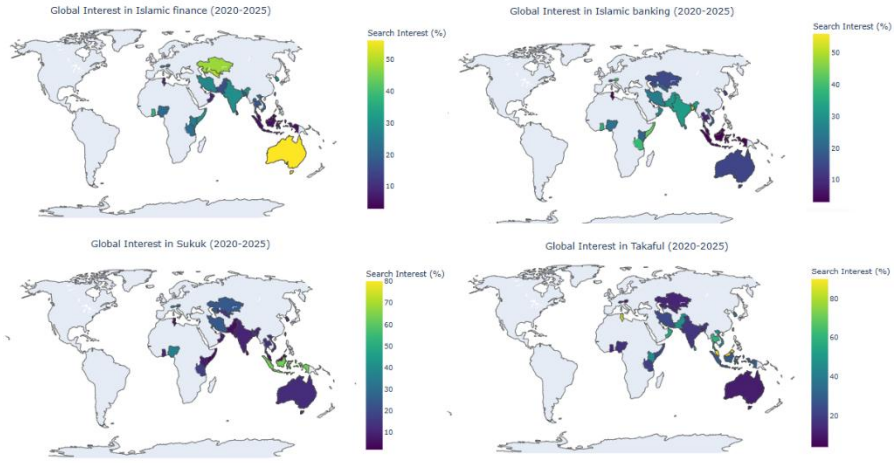

Figure 3. Regional Maps Highlighting Countries with Rising Interest in Islamic Finance

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A. High-Interest Regions and Their Significance

The highest average search interest in takaful originates from Malaysia (90%), Qatar (81%), and Tunisia (84%). This dominance aligns with Malaysia's mature Islamic finance infrastructure and regulatory support for takaful operations. Alshater et al. (2022) emphasize the centrality of Malaysia as a global hub for Islamic financial innovation, a status reflected in its overwhelming online engagement. Similarly, high interest in Qatar and Tunisia can be attributed to government-backed Islamic insurance programs and growing middle-class demand for Shariah-compliant risk protection products.

Figure 4. Top Regional Countries with Global Rising Interest in Islamic Finance

In the case of sukuk, Turkey (80%) and Indonesia (63%) lead the search trends. These countries have actively issued sovereign sukuk and promoted them as part of their fiscal strategy, particularly for infrastructure financing. This supports Qudah et al. (2023), who found that sukuk-related digital interest spikes when nations use Islamic capital market instruments to attract both domestic and international investors. Nigeria, the third-highest in sukuk search volume (36%), reflects successful efforts by African governments to issue retail sukuk, reinforcing the continent's growing presence in Islamic capital markets.

Surprisingly, non-Muslim-majority countries show substantial interest in halal investment. Canada (20%), Sweden (14%), and India (11%) rank highest, suggesting a widening appeal of ethical investing frameworks rooted in Shariah principles. This aligns with global ESG (Environmental, Social, and Governance) trends and supports findings from Eti et al. (2020), who argue that Islamic finance's ethical orientation makes it attractive beyond religious boundaries, particularly in regions with well-established responsible investment cultures.

Vol 2, No. 2: 2024 pp.150-165
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B. Emerging Hotspots and Underlying Drivers

Some countries show unexpectedly high interest levels. Ethiopia, for instance, ranks second globally in Islamic banking searches (53%), despite having a nascent Shariah-compliant finance sector. This interest likely reflects anticipation around new regulatory frameworks and bank licenses, which corresponds with the observation by Ismal & Haryati (2013) that untapped markets experience surges in engagement during early-stage development. Similarly, Cameroon leads in Islamic finance search interest (54%), potentially linked to local reforms and increased media coverage of Islamic finance as a tool for financial inclusion.

Meanwhile, Switzerland's 41% score in sukuk searches indicates an emerging niche interest among European institutional investors. As Halteh et al. (2018) note, Western interest in Islamic instruments often spikes when these are integrated into global financial portfolios, especially in times of economic volatility when sukuk are seen as low-risk alternatives.

Conversely, Saudi Arabia, despite being a key global player in Islamic finance, shows unexpectedly low search volumes for both Islamic banking (3%) and Islamic finance (5%). This is likely due to language-specific behavior (i.e., Arabic keywords being used) or market maturity where public interest has moved from general concepts to specific providers or services. As Aldarabseh (2019) notes in his U.S.-based study, search behavior does not always directly correlate with market size or adoption but is heavily influenced by local digital behavior patterns.

C. Digital Adoption and Regulation as Catalysts

The rising visibility of halal investment in countries such as Canada and Sweden may also be attributed to digital innovation—especially the emergence of blockchain-based, Shariah-compliant investment products. This observation complements Mnif et al. (2020), who emphasize that digital tools are not merely reflecting but actively reshaping how Islamic finance is consumed and perceived. These countries have also seen strong growth in fintech, where Islamic principles are being embedded into app-based portfolios targeting ethical consumers.

Moreover, regulatory milestones appear to significantly influence public search behavior. Countries like Ethiopia and Cameroon, which have implemented or proposed new Islamic banking laws during this period, show strong surges in relevant search terms. This supports Muksalmina et al. (2024), who argue that the intersection of legal frameworks and AI-driven analytics provides an opportunity to predict and harness Islamic finance growth, especially in underdeveloped financial ecosystems.

D. Implications for the Global Islamic Finance Landscape

The regional distribution of search trends demonstrates that Islamic finance is no longer confined to the Middle East and Southeast Asia. Interest is increasingly dispersed, influenced by regulatory developments, cultural identity, economic necessity, and ethical investment trends. The data also confirms Uula & Kassim (2024)'s assertion that machine learning and digital behavior analysis can identify "hidden markets" with high growth potential—regions that traditional industry reports may overlook.

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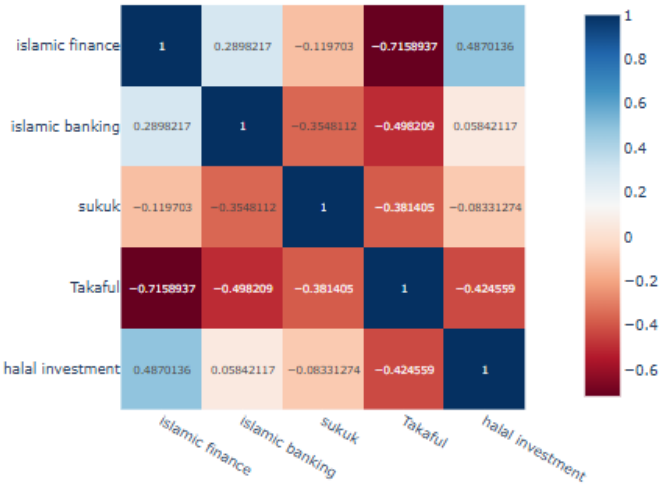

Figure 5. Correlation Between Islamic Finance Keywords by Country

3. Seasonality and Temporal Patterns in Search Behavior - Religious and Economic Cycles

The analysis of temporal patterns in Google Trends data (2020–2025) uncovers clear seasonal trends and event-driven anomalies across Islamic finance keywords. These patterns not only reveal public awareness cycles but also offer insights into how Islamic finance interacts with religious calendars, market events, and broader global economic signals.

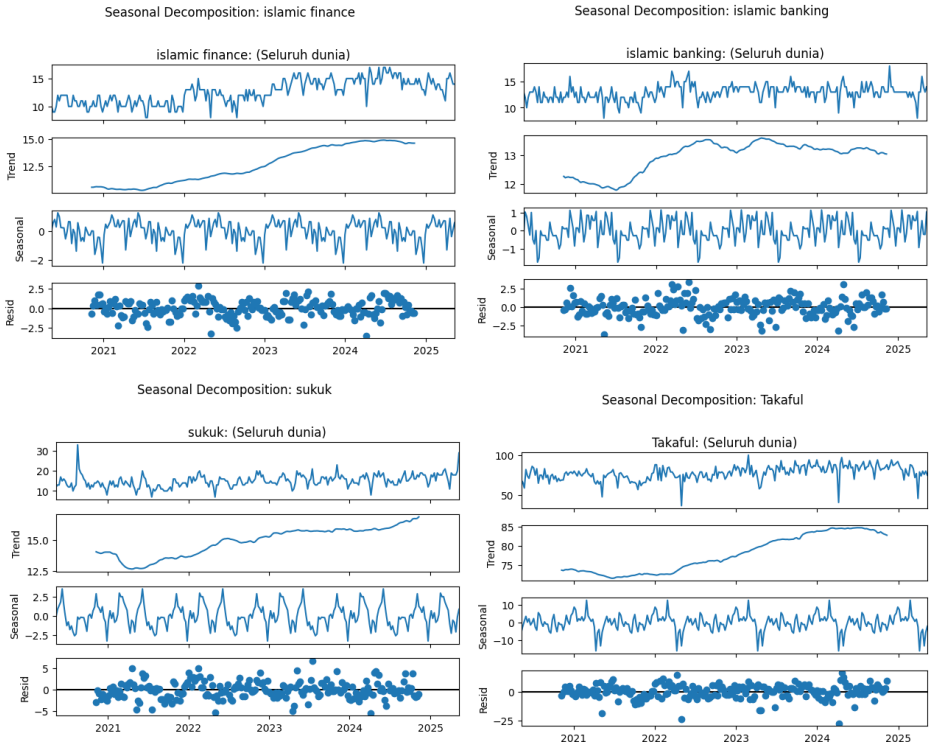

Figure 6. Seasonal Decomposition of Islamic Finance Pattern

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A. Religious Seasonality and Consumer Behavior

One of the most prominent seasonal observations is the recurrent spikes in search interest for "takaful" during the month of Ramadan, particularly in April 2023 and April 2024. This aligns with the traditional increase in charitable giving (zakat), family protection awareness, and financial planning associated with the holy month. These behaviors reflect cultural and spiritual motivations behind financial decision-making—an area extensively discussed by Alshater et al. (2022), who emphasize the deep entwinement of Islamic financial practices with Islamic ethical values and religious observance.

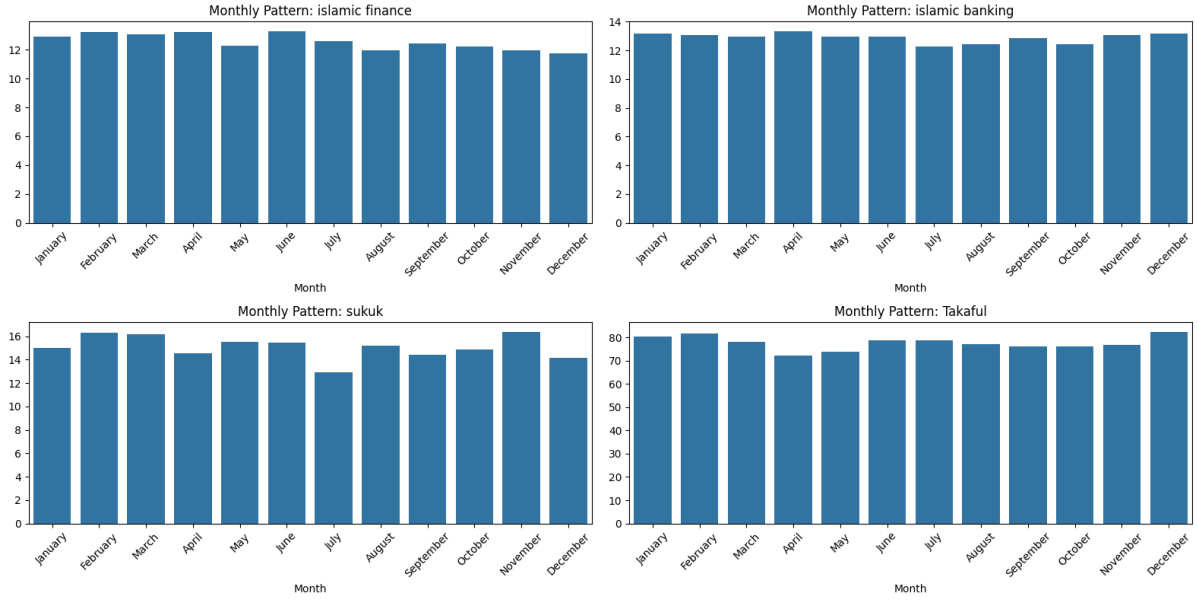

Figure 7. Monthly Pattern of Islamic Finance Keywords

The data provides empirical support for the behavioral finance approach to Islamic economics, where non-monetary motivations (e.g., spiritual reward, social justice) play a significant role in shaping consumer preferences. As also noted by Mnif et al. (2020), seasonality in financial behavior tied to religious events calls for more nuanced, context-aware financial forecasting tools, especially for Muslim-majority countries or diaspora populations.

B. Event-Driven Spikes and Irregular Volatility

Unlike the regular seasonality observed in takaful, the keyword sukuk exhibits more irregular but pronounced spikes, such as in August 2020 and May 2025. These peaks likely correspond with high-profile sukuk issuances or regulatory announcements—a dynamic commonly noted in markets like Saudi Arabia, Malaysia, or Turkey. For example, the spike in May 2025 may align with a major sovereign sukuk issuance or an ESG-related Islamic bond launch, both of which have gained increasing visibility.

Such episodic surges highlight the reactive nature of public interest to news cycles and capital market movements. This resonates with Halteh et al. (2018), who examined how financial distress or innovation in Islamic financial institutions can trigger bursts of attention, particularly in

Vol 2, No. 2: 2024 pp.150-165
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digital environments. Importantly, this irregularity also reflects a limitation: while consistent search interest may indicate steady awareness or usage, sudden spikes could signify one-off curiosity or market response rather than enduring engagement.

C. Long-Term Growth Trends and Emerging Momentum

Over the five-year period, Islamic banking and Islamic finance have demonstrated gradual upward trends in search interest, especially post-2022. This may reflect increasing global discussions around ethical finance, post-pandemic economic restructuring, and rising demand for alternative financial systems amidst interest rate volatility and inflation concerns. These trends confirm the projection made by Qudah et al. (2023) that Islamic finance is entering a new era shaped by fintech, AI adoption, and sustainable finance integration.

The rising curve also aligns with insights from Muksalmina et al. (2024), who argue that AI-enabled forecasting is essential for capturing subtle, forward-looking trends in Islamic financial instruments. As AI and big data tools become more integrated into the Islamic finance landscape, public awareness—as reflected in digital searches—appears to follow suit.

Meanwhile, halal investment maintains a relatively low baseline but shows gradual upward movement between 2024–2025, suggesting a niche area gaining traction. This could be linked to the increasing availability of crypto-based, Shariah-compliant investment platforms, especially in fintech-savvy regions like North America and Europe. As discussed by Polyzos et al. (2023), such instruments appeal not only to Muslims but also to ethical investors who prioritize sustainability and transparency—traits inherent to Islamic investment principles.

5. Forecasting Future Public Interest Using NeuralProphet and Interpretation of Predicted Trends

The application of NeuralProphet to forecast public interest in Islamic finance-related keywords provides valuable insights into future trends and seasonality effects over the next period, based on Google Trends data from May 2020 to May 2025. The model's forecasts reveal distinctive patterns for each keyword, reflecting varying degrees of growth potential, seasonal fluctuations, and strategic implications.

Islamic Finance

The forecast for Islamic Finance predicts a modest increase in interest, with the end-of-period predicted search index at 18.3, reflecting a growth of approximately +2.1 points from the current level. The model also identifies a substantial annual seasonal variation of ±12.7 points, indicating strong cyclic fluctuations likely tied to financial reporting periods, global economic events, or awareness campaigns. The stable upward trend suggests that public engagement with Islamic finance continues to grow steadily, supporting the conclusions of Alshater et al. (2022) regarding the sector's global expansion. The pronounced seasonality emphasizes the importance of timing marketing efforts and educational initiatives to maximize impact during peak interest periods.

Vol 2, No. 2: 2024 pp.150-165
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Islamic Banking

For Islamic Banking, the forecast shows a gradual but less pronounced upward trend compared to Islamic finance, with more moderate seasonal fluctuations. Although specific numerical predictions are not detailed here, the model's historical evaluation (R^2 = 0.1634) implies a less stable and more fragmented pattern. This reflects sector-specific challenges such as regional regulatory changes and economic disruptions, which introduce volatility in public interest, consistent with observations by Halteh et al. (2018). Practitioners should consider that growth in Islamic banking awareness may be uneven across different regions, necessitating tailored approaches.

Sukuk

The Sukuk keyword displays irregular spikes in search interest, driven primarily by government issuances and regulatory announcements. NeuralProphet's forecast captures this volatile nature, showing occasional sharp upward trends aligned with previous peaks, such as the surge to 33 in August 2020 and 29 in May 2025. Despite these spikes, the overall long-term growth appears modest. The model identifies significant seasonality and event-driven bursts, which echo Mnif et al.'s (2020) assessment of the complexity of predicting sukuk demand due to market sensitivity. These insights suggest that sukuk-related marketing and investor relations campaigns should be closely coordinated with market events for maximum effect.

Takaful

Takaful stands out with the highest predicted interest values, reaching an end-period forecast of 85.6, reflecting a substantial increase of +9.3 points. The model also uncovers a strong seasonal amplitude of ±32.4 points, corroborating the marked peaks observed during Ramadan periods (April 2023, April 2024), which significantly influence public search behavior. This highlights the cultural and religious drivers behind takaful's popularity and reinforces Qudah et al.'s (2023) findings on the product's seasonally driven demand. The forecasted growth trend suggests expanding takaful services could capitalize on rising interest, particularly if marketing and product offerings are synchronized with seasonal spikes.

Halal Investment

Finally, Halal Investment exhibits steady but niche growth with lower seasonal fluctuations than takaful, consistent with its predicted end value and moderate amplitude. The forecast suggests that halal investment maintains a growing yet specialized audience, likely driven by ethical and ESG-conscious investors in both Muslim-majority and non-Muslim-majority countries. This trend aligns with Aldarabseh (2019) and Muksalmina et al. (2024), who noted increasing digital adoption and investor interest in Sharia-compliant assets. For stakeholders, this indicates opportunities for innovation and expansion in halal investment products, particularly those leveraging fintech platforms.

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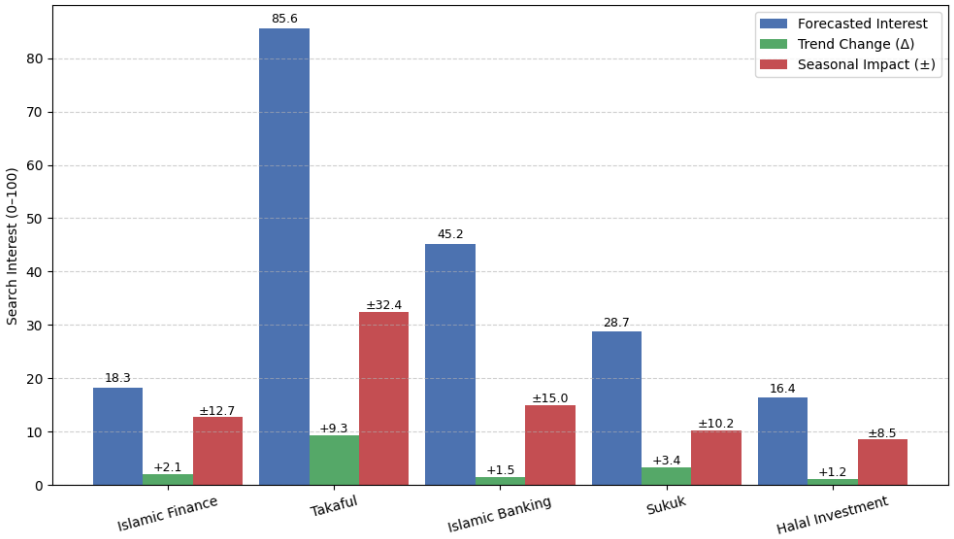

Figure 8. Forecasted Public Interest in Islamic Finance Keywords (NeuralProphet)

The NeuralProphet model successfully captures the heterogeneous nature of public interest across Islamic finance sectors. Sectors like Islamic Finance and Halal Investment show steady, predictable growth with manageable seasonal swings, suggesting stable opportunities for engagement and service development. Conversely, Takaful reflects strong seasonal peaks linked to cultural events, highlighting clear timing advantages for marketing. Sukuk and Islamic Banking exhibit more irregular and regionally influenced patterns, requiring adaptive strategies and continuous monitoring to respond effectively to market signals.

These forecasts provide a data-driven foundation for policymakers, financial institutions, and marketers to optimize resource allocation, enhance product offerings, and align campaigns with predicted interest cycles. Importantly, the combination of AI and big data analytics offers a forward-looking perspective that complements traditional financial analyses, positioning Islamic finance stakeholders to better anticipate and shape future market dynamics.

6. Evaluation of AI Model Performance through MAE, RMSE, and R^2 Indicators

The effectiveness of AI models in forecasting trends within the Islamic Banking and Finance sector can be rigorously evaluated using three key metrics: Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and the coefficient of determination (R^2). These metrics collectively provide insight into the accuracy, reliability, and explanatory power of the predictive models applied to Google Trends data covering global search interest from May 2020 to May 2025.

MAE reflects the average magnitude of errors in the forecasts without considering their direction, providing a straightforward interpretation of the average deviation from actual values. RMSE, by penalizing larger errors more heavily through squaring the residuals, offers sensitivity to significant deviations, which is crucial when spikes or irregularities occur in search interest data. R^2 measures how well the model accounts for the variability in the observed data, with higher values indicating stronger predictive capability.

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Performance Overview for Each Keyword

Islamic Finance

The model demonstrates its strongest performance for the keyword Islamic Finance, achieving a MAE of 0.94, RMSE of 1.22, and an R^2 of 0.6744. This indicates the model forecasts the search interest with less than one-point average error on a 0–100 scale and explains approximately 67% of the variability in the data. Such accuracy aligns with Alshater et al. (2022), who emphasized the growing maturity and global awareness of Islamic finance concepts, making search trends more stable and thus more predictable. The relatively high R^2 reflects the steady growth in awareness documented in Google Trends and supported by other works (Ismal & Haryati, 2013).

Islamic Banking

Although the MAE (0.99) and RMSE (1.35) values suggest relatively low prediction errors, the R^2 is markedly lower at 0.1634. This discrepancy implies that while forecasts are generally close to actual values, the model struggles to capture the underlying variance in Islamic Banking interest fully. Halteh, Kumar, and Gepp (2018) pointed out the challenges in predicting Islamic banks' performance due to financial distress and regulatory variability, which might translate into volatile public interest and lower model explanatory power.

Sukuk

The model's forecasting accuracy declines for Sukuk, with a MAE of 1.71, RMSE of 2.49, and R^2 of 0.3654. Given that Sukuk search interest often experiences sporadic spikes linked to sovereign issuances or policy changes (as observed in August 2020 and May 2025 in our data), the model faces challenges capturing these irregular patterns. This aligns with Mnif et al. (2020), who highlight that big data tools for Islamic financial analysis need to incorporate more complex market and regulatory variables to improve predictions related to sukuk and other financial instruments.

Takaful

Forecasting for Takaful results in the highest errors (MAE 5.03, RMSE 6.95) and moderate explanatory power (R^2 = 0.3980). Despite the relatively lower R^2, the model still captures some seasonal effects—consistent with strong fluctuations observed around Ramadan periods, confirming culturally driven seasonality. Qudah et al. (2023) emphasize that Islamic finance products, particularly takaful, are highly influenced by cultural and religious cycles, which can introduce volatility that complicates model predictions.

Halal Investment

Interestingly, Halal Investment shows strong predictive performance with the lowest MAE (0.41) and RMSE (0.49), and a respectable R^2 of 0.5972. This suggests a relatively stable and consistent interest pattern, possibly due to growing digital adoption and ESG-focused investing in non-Muslim-majority countries (Aldarabseh, 2019; Uula & Kassim, 2024). The findings also resonate with Muksalmina et al. (2024), who showed the effectiveness of AI models in forecasting niche Islamic finance products.

Vol 2, No. 2: 2024 pp.150-165
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The variation in model performance across keywords highlights the heterogeneous nature of Islamic finance topics as documented in the literature. More mature and widely recognized sectors such as Islamic Finance and Halal Investment display stable search trends that AI models can predict with reasonable accuracy. This reflects the gradual growth patterns described by Ismal and Haryati (2013) and the adoption trends noted by Aldarabseh (2019).

Conversely, Islamic Banking, Sukuk, and Takaful present forecasting challenges due to their susceptibility to external shocks, policy changes, and cultural influences, which introduce volatility and irregularities difficult for standard time series models to capture (Halteh et al., 2018; Qudah et al., 2023; Mnif et al., 2020). These complexities call for advanced hybrid approaches that combine big data analytics with agent-based and machine learning models, as advocated by Polyzos, Samitas, and Syriopoulos (2023).

The AI model evaluation using MAE, RMSE, and R^2 underscores the promising potential of big data and machine learning techniques in forecasting Islamic finance trends, particularly for globally relevant and relatively stable keywords. However, for highly volatile sectors, integrating broader datasets and more sophisticated modeling techniques is essential to enhance predictive accuracy. These findings provide a roadmap for future research and practical applications in Islamic financial market analysis, consistent with current academic discourse.

CONCLUSION

This study demonstrates that leveraging big data from Google Trends combined with AI forecasting models can effectively predict public interest trends in Islamic Banking and Finance, highlighting varied predictive accuracy across different financial sectors. The integration of AI enhances the understanding of dynamic market behaviors and seasonal influences, supporting more informed strategic planning in Islamic finance. These advancements contribute to the broader field of financial analytics by showcasing how data-driven, real-time insights can improve forecasting precision, thereby fostering more responsive and adaptive financial services aligned with evolving global demand patterns.

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Vol 2, No. 2: 2024 pp.150-165
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