

Investigating the Asymmetric Effects of Global Economic Factors on Sukuk Returns: A NARDL Perspective

دراسة التأثيرات غير المتماثلة للعوامل الاقتصادية العالمية على عوائد الصكوك: منظور نموذج NARDL

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Abstract:

This study examines the asymmetric impact of the global economic factors, specifically the U.S. Dollar Index (DXY), Shariah compliance risk (HQR) and credit risk (SMB) on the Dow Jones Sukuk Total Return Index (ex-Reinvestment) using the NARDL approach. Daily observations (March 2015 to March 2025) reveal significant long-run cointegration and short-run asymmetries. Findings indicate that Shariah compliance risk asymmetrically reduces Sukuk returns, reflecting acute investor sensitivity to compliance deviations. On the other hand, U.S. dollar fluctuations show limited long-run effects but short-run asymmetry during dollar weakening, underscoring Sukuk resilience to currency volatility. The Credit risk exerts statistically significant but economically modest influence. The model's explanatory power confirms that intrinsic faith-based drivers dominate global macroeconomic factors in Sukuk performance. The study advocates enhanced Shariah governance, dynamic risk management, and secondary market development to strengthen Islamic finance integrity and investor confidence.

Keywords: Sukuk Returns; Asymmetric Effects; Shariah Compliance Risk; U.S. Dollar Index; NARDL Model.

JEL Classification Codes : G15, E44, G32, Z12, C32.

ملخص:

تفحص الدراسة التأثير غير المتماثل للعوامل الاقتصادية العالمية، بالتحديد مؤشر الدولار الأمريكي (DXY)، مخاطر الامتثال الشرعي (HQR) ومخاطر الائتمان (SMB)، على مؤشر العائد الإجمالي لصكوك داوجونز (باستثناء إعادة الاستثمار) باستخدام نموذج NARDL. كشفت الملاحظات اليومية (مارس 2015 إلى مارس 2025) عن تكامل مشترك طويل الأجل دال احصائيا وعدم تماثل قصير الأجل. وتشير النتائج إلى أن مخاطر الامتثال الشرعي تؤدي إلى انخفاض غير متماثل في عوائد الصكوك، مما يعكس حساسية المستثمرين الشديدة تجاه أي انحرافات عن المعايير الشرعية. بينما تُظهر تقلبات الدولار تأثيرًا محدودًا على المدى الطويل، وتأثيرًا غير متماثل في الأجل القصير عند ضعفه، ما يعكس مرونة سوق الصكوك تجاه تقلبات العملات. أما مخاطر الائتمان، فقد ثبت تأثيرها الإحصائي، وإن كان محدودًا اقتصاديًا. وتؤكد القوة التفسيرية للنموذج أن العوامل الدينية الجوهرية أكثر تأثيرًا من المتغيرات الاقتصادية العالمية في تحديد أداء الصكوك. وتوصي الدراسة بتعزيز الحوكمة الشرعية، تطوير أدوات إدارة المخاطر، وتفعيل الأسواق الثانوية لدعم مصداقية المالية الإسلامية وتعزيز ثقة المستثمرين.

كلمات مفتاحية: عوائد الصكوك، التأثيرات غير المتماثلة، مخاطر الامتثال الشرعي، مؤشر الدولار الأمريكي، نموذج NARDL

تصنيفات JEL: G15، E44، G32، Z12، C32.

INTRODUCTION:

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Global market for Sukuk has grown significantly during the past decade, responding to the faster growing demand for Islamic-compliant investment instruments by investors and stronger interest from global investors in diversifying their portfolios ((IFSB), 2023, p. 4). For instance, in Indonesia, the issuance of State Sukuk (SBSN) directly contributed to financing large-scale infrastructure projects, thereby demonstrating sukuk's effectiveness as a tool for economic development. (p.133, 2023, جعفر هني & قورين) Sukuk are asset-based financing securities that are structurally distinct from traditional bonds by using the approach of sharing profits and losses rather than interest payments thus giving them a different risk/return profile. Despite Sukuk's growing importance in the global financial system, the dynamics of their returns and sensitivity to economic factors remain poorly understood. Particularly, the potential existence of asymmetric effects requires further investigation. (El-Gamal, 2006, p. 62).

In this vein, the current paper explores the asymmetric reply of the world Sukuk returns to the global macroeconomic factors, including the US Dollar Index (DXY), Shariah compliance risk (HQR), and credit risk (SMB). It is assumed that both short-term and long-term changes in the US Dollar Index asymmetrically affect Sukuk returns, while Shariah-compliant risk has a strong and pronounced asymmetric effect, with the market responding more significantly to declines in the level of compliance compared to improvement (Azmat and others, 2014, p. s135). It also considers that the contribution of the credit risk effect on the return of Sukuk is somehow small in comparison with other factors (Godlewski and others, 2013, p. 752).

This paper adds to the empirical research of the global Sukuk market by developing an understanding of the dynamics that shape it, contributes to the variety of literature discussing the economies of Islamic finance markets, and is especially beneficial for investors and policymakers, particularly in times of global economic turmoil. The study aims to investigate the asymmetry of world economic factors on Sukuk returns, the sensitivity of the returns towards both positive and negative shocks of the US Dollar Index, shariah compliance risk and credit risk, and practicable measures and useful suggestions to stabilize and attract global investors to the Sukuk market.

The study utilizes the state-of-the-art econometric technique, the Nonlinear Autoregressive Distributed Lag (NARDL) model, which allows disentangling asymmetric short-run as well as long-run effects (Shin and others, 2014, p. 283). For the sake of clarity and for analytical reasons, the research is broken down into separate sections. The next section is about the review of relevant literature, while the third explains the methodology and the NARDL model employed, and the fourth provides detailed empirical findings and discussion, while the last section concludes with the major findings and policy implications.

1- Literature Review:

Numerous studies have addressed sukuk returns from various perspectives. Some focused on internal issuance characteristics of sukuk, while others examined the effect of macroeconomic variables and financial risks on sukuk performance. For example, (Shalhoob, 2018, p. 618) analyzed the factors explaining fluctuations in sovereign sukuk yields and found that the yield is significantly influenced by issuance attributes (such as credit rating, maturity, size, and type) using a linear regression model.

Likewise, (Abdul Rauf, 2016, p. 13) in an econometric analysis to measure the relation between risk and return in the sukuk market, studied the influence of different types of risk, including credit risk and Shari'ah compliance risk, on the returns of the Dow Jones Sukuk Price

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Index by using a multiple linear regression (OLS) technique. The independent variables were interest rate risk, inflation, exchange rate (USD), consumer confidence, maturity risk, credit risk (SMB), Shari'ah compliance risk (HQR), and liquidity risk. The findings showed that credit risk, Shari'ah compliance risk, inflation rate, and interest rate were positively significantly related to sukuk returns. Consequently, the author suggested curbing inflation, incorporating Shari'ah-related factors into sukuk pricing, and establishing dynamic secondary markets to promote liquidity in such Islamic-based financial intermediations.

Recently, several studies have started to account for the impact of macroeconomic variables using advanced econometric techniques. For instance, (Baykut, 2024, p. 60) conducted a study using the ARDL model on monthly data from the Turkish sukuk market (2013–2024) to analyze the impact of inflation, interest rate, and the USD/TRY exchange rate on sukuk returns. The cointegration results showed significant long-run relationships: inflation and interest rate differentials had a positive impact on returns, while depreciation of the lira (i.e., an increase in the DXY) had a long-run negative effect. The model also indicated a short-run error correction mechanism toward long-run equilibrium.

Similarly, (Roslen and others, 2013, p. 112) used the ARDL approach to study the Malaysian sukuk market and found both short- and long-run relationships between financial risk indicators and sukuk development. In other words, global liquidity showed positive long-term effects but negative short-term ones, suggesting that international liquidity—measured as global monetary abundance—is associated with sukuk market prosperity in the long run, while possibly exerting adverse short-term effects. This approach highlighted the importance of examining both short- and long-term relationships, as the economic impact of these variables may vary depending on the time horizon of the analysis.

On the other hand, other researchers employed cointegration and vector error correction models (VECM) to study the influence of macroeconomic variables on sukuk returns. (Jais, 2024, p. 8) studied the performance of green sukuk in Indonesia and found evidence that short- and long-run returns are significantly affected by inflation, exchange rates, and stock market indices, while the impact of interest rates was weak in the long run.

Following the same approach, (Febriana and others, 2024, p. 1) analyzed the determinants of the Indonesian sukuk index before and during the COVID-19 pandemic. Before the pandemic, returns were strongly linked to the VIX, interest rates, and exchange rates. During the pandemic, global sukuk indices, the VIX, inflation, and exchange rates became the dominant factors, with interest rates playing a diminished role—suggesting that the hierarchy of determinants shifts during crises.

Nonlinear analyses using Quantile Regression and the NARDL model have added deeper insights. For example, (Naifar & Hammoudeh, 2016, p. 64) employed quantile regression to assess the impact of global financial uncertainty, economic policy, and oil prices on the returns of GCC sukuk. Their results showed significant negative effects during severe market downturns. Interestingly, volatility in gold and conventional bond markets did not significantly impact GCC sukuk but negatively affected global sukuk indices.

In the same context, (Sial and others, 2022, p. 11) found, using quantile regression, a positive relationship between sukuk returns and emerging market equity indices, with no significant

impact of the VIX. This suggests that sukuk may be less sensitive to global uncertainty compared to other asset classes.

In terms of asymmetry, (Jallow & Joof, 2020, p. 13) used the NARDL model to explore the relationship between sukuk returns and economic growth in Indonesia. The results revealed long-run asymmetry: positive shocks in sukuk returns had a statistically significant and positive impact on GDP growth, whereas negative shocks had an insignificant effect. This implies that while improved sukuk performance supports economic growth, declining returns do not necessarily translate into equally strong negative effects on economic activity—indicating a nonlinear relationship between sukuk and macroeconomic growth.

Moreover, other studies focused on dynamic volatility and the relationship between sukuk and conventional financial markets using multivariate GARCH models. (Naifar, 2018, p. 17) used the DCC-GARCH model and found a time-varying negative correlation between GCC sukuk indices and commodity prices (including precious metals, agricultural, industrial, and energy commodities), indicating diversification benefits.

In another study, (Sclip and others, 2016, p. 15) applied the DCC-GARCH model to examine the relationships between sukuk and stock markets in the US, Europe, and others. The results indicated strong sensitivity to US and European stock indices (e.g., S&P 500), especially during crises. Sukuk showed lower volatility compared to other assets, emphasizing the benefits of diversification.

Furthermore, global indices have been integrated into modern forecasting models to assess their effect on sukuk performance. (Tülgen Çetin & Metlek, 2021) employed artificial neural networks to predict Turkish sovereign sukuk prices, incorporating the DXY, VIX, S&P MENA Sukuk Index, geopolitical risk, and Eurobond prices. Their model showed strong predictive power and confirmed the importance of these global variables, which must be considered when analyzing sukuk performance.

Despite increasing evidence on sukuk returns, there are still substantial gaps and limitations, as few studies have explored the qualitative and risk factors in the global sukuk market. Most of the prior work has been centered on either domestic issue-related factors or conventional macro variables, including inflation and interest rates. These studies generally used linear models, while the sukuk market dynamics and the short-term volatility in the market in particular, especially during financial crises, cannot be understood effectively given the use of low-frequency data (monthly or quarterly).

Very few studies have investigated the effects of Shari'ah compliance risk (HQR) and credit risk (SMB) on sukuk returns, even though these factors are fundamental in the pricing and evaluation of Islamic financial instruments. Moreover, the U.S. Dollar Index (DXY), which reflects the strength of the dollar as a global reserve currency, has not been sufficiently integrated into high-frequency econometric analyses of sukuk returns.

Against this backdrop, the purpose of this paper is to address these gaps in the literature through the development of a non-linear econometric model that is structured in terms of NARDL, in order to investigate the dynamic and asymmetric relationship between three explanatory variables, namely DXY, HQR and SMB, and the Dow Jones Sukuk Total Return Index on the basis of daily data over the period of March 2015 to March 2025.

Specifically, the study seeks to:

- Analyze the short-run and long-run effects of DXY, HQR, and SMB on sukuk returns.

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- Investigate the presence of asymmetric effects (positive vs. negative shocks) of these variables on sukuk performance.
- Provide data-driven recommendations to enhance risk management tools and improve the efficiency of secondary markets for sukuk.

2- Definition of variables:

2-1 Dow Jones Sukuk Total Return Index (ex-Reinvestment)

It is one of the most widely utilized benchmarks in the world for tracking the performance of Sharia-compliant sukuk markets. This return is determined by using the log difference between consecutive daily index levels, providing a close-to-ideal tracking of relative changes in financial market performance:

$$Return_t = \ln\left(\frac{Index_t}{Index_{t-1}}\right)$$

The index was started on April 28, 2006 and its historical data dates back to September 30, 2005. It is converted to USD and regularly updated on a trading day basis, which allows the exposure to short-term fluctuations to be analyzed (especially during periods of financial crisis). This index features only sukuk that is expressly "Investment Grade" rated (BBB- or Baa3 or equivalent) by the major rating agencies and is expressly labeled as "Sukuk" by Thomson Reuters. It is also subject to a minimum issue size of USD 200 million and a final maturity of over one year. The index is market-value weighted, meaning that the influence of each issue is proportional to its market value.

As of March 31, 2025, the index consists of 131 sukuk with a combined outstanding market value of USD 141.3 billion and carries an average nominal coupon of 4.36%, a modified duration of 4.41 years, and a weighted average maturity of 5.64 years. The index has an average annual return over the last ten years of approximately 3.02%, and the current yield to maturity is approximately 4.88%.

Using this index as a dependent variable in the work offers a widely accepted and market-based measure that facilitates a rigorous examination of sukuk performance vis-à-vis macroeconomic factors using high-frequency daily data that do not account for reinvested cash flows. (S&P Dow Jones Indices, 2025, p. 5)

2-2 U.S. Dollar Index (DXY)

The U.S. Dollar Index (DXY) is a measure of the value of the United States dollar relative to a basket of foreign currencies and is the index that defines the value of the US dollar in contrast to its most significant trading partners (Morgan Stanley, 2018). It is one of the most frequently used measures for how the dollar is faring as the world's main reserve currency (Euromoney, 2012). The index is derived from a weighted geometric average of the dollar's exchange rates with these 6 other major currencies: euro, Japanese yen, pound sterling, Canadian dollar, Swedish krona, and Swiss franc (ICE Futures U.S., 2015, p. 2).

DXY was created in 1973 by the U.S. Federal Reserve after the demise of the Bretton Woods exchange rate system and is currently operated by Intercontinental Exchange (ICE) (ICE Futures U.S., 2015, p. 3). Fluctuation in DXY is often considered the barometer for the international purchasing power of the US dollar (J.P. Morgan Private Bank EMEA, 2025), and the reading is closely monitored by investors and policymakers as an indicator of market sentiment and expectations for US monetary policy. For instance, a strengthening DXY may correspond

with higher U.S. interest rates or “tighter” monetary policy as players are interested in dollar-denominated assets and move capital into havens (Yan, 2024).

3-2 SMB (Credit Risk Factor)

The SMB variable, which is highly employed in sukuk financial literature, represents a risk premium on credit. It usually measures the yield differential between high-yield (or low-rated or high-risk) sukuk and safer, investment-grade sukuk. SMB is a measure of the credit risk of the sukuk market. Since SMB represents the risk associated with higher credit risk issuers' demand for returns, it acts as a credit risk proxy in the sukuk market (Abdul Rauf, 2016, p. 4). The higher the spread calculated by SMB, the greater the perceived credit risk in the market. This LFA is often used as a control variable in empirical models to estimate the pass-through of company creditworthiness changes on sukuk returns. This is generally calculated as the spread (expressed in yields) between average returns for various classes of sukuk by their respective credit ratings (Abdul Rauf & Ibrahim, 2014, p. 72).

3-3 HQR (Shari'ah Compliance Risk Indicator)

The HQR variable represents **Shariah non-compliance risk**, constructed as the return spread between high-quality Shariah-compliant sukuk and other sukuk instruments. This market-based proxy captures the premium investors demand for perceived compliance risks, where higher values indicate greater non-compliance risk. Formally, HQR is calculated as:

$$HQR_t = R_t^{HQ} - R_t^{Other}$$

where R_t^{HQ} denotes returns of high-quality Shariah-compliant sukuk and R_t^{Other} represents returns of other sukuk instruments.

HQR falls under the category of liquidity risk within Islamic financial instruments (Abdul Rauf, 2016, p. 10). Sukuk issuances that are perceived to possess a high level of Shari'ah integrity and transparency are regarded as having lesser compliance risk, and vice versa, where issuances are perceived as having nebulous or contentious structures, this carries more of a reputational or regulatory risk. This measurement has been constructed using the return spread between high-quality Shari'ah-compliant sukuk and the other instruments, which acts as a market-based proxy for Shari'ah compliance (Jallow & Joof, 2020, p. 13). It is believed that Shari'ah compliance risk can have a strong bearing on investor confidence and thereby affect sukuk pricing and yields and is therefore the HQR in the performance analysis of Islamic fixed-income instruments (Sial and others, 2022, p. 1).

3- Research Methodology

The research method used in the current study is the Nonlinear Autoregressive Distributed Lag Model Approach (NARDL), which allows for identifying the long-term asymmetric and nonlinear relationship among variables. Additionally, this method distinguishes between short-run and long-run effects of independent variables on dependent variables.

3-1 Data description

The current study covers the period March 31, 2015, through March 31, 2025 with 2500 observations. This period sample choice was determined by the daily data available for the Dow Jones Sukuk Total Return Index (without reinvestment), which is the main overall measure for sukuk returns. With all series in the sample having a daily frequency of observation, the dynamic effects of the macroeconomic and financial factors chosen on sukuk returns can be captured.

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The source of the data is the official and most reliable and internationally approved source. The dependent variable, sukuk returns, was constructed applying the logarithmic return formula based on the price of the Dow Jones Sukuk Total Return Index (ex-reinvestment), which is retrieved from S&P Global.com. The High-Quality Sukuk Index (Shariah) was also obtained from the same source. The explanatory variables (e.g., the DXY, High Yield Spread) were downloaded from the Federal Reserve Economic Data (FRED).

Before estimating, a series of specification tests were made to evaluate basic econometric properties of the unprocessed data. The Breusch-Pagan-Godfrey test showed significant heteroskedasticity, with the residuals exhibiting volatility clustering. In addition, the residual histogram exhibited significant violations from normality, including heavy tails and high kurtosis (indicating skewed distribution and outliers). To counteract these problems, the dependent variable (sukuk returns) was transformed using Box-Cox to minimize heteroskedasticity and normalize the data. The logarithm of the explanatory variables was used to minimize the variance and adjust the high-value points. This approach is strongly advocated in the econometric literature (within the context of high-frequency financial time series), where non-constant variance is a common feature. As (Wooldridge, 2012, p. 41) has highlighted, the transformation from the fraction to the log form assists with variance stabilization, normalizing residual distributions, aiding correct model specification, and delivering more interpretable results in terms of elasticities. The Box-Cox lambda was estimated at 0.15, implying a near-log transformation. We verified that using simple log-returns yields qualitatively identical results (not reported but available upon request).

A number of diagnostic tests were performed to confirm the robustness of these transformations, including the White test for conditional heteroskedasticity, the Breusch-Godfrey LM test for serial correlation, and the use of HAC (Newey-West) standard errors to adjust for possible autocorrelation and heteroskedasticity. It was found that such a new approach led to a model with better statistical properties, higher reliability, and better economic interpretation of the estimated relations. The analysis concludes that the transformed data should be used for further analysis due to the significant improvements in model fit, statistical significance, and residual distribution, despite the original data having better ECM performance metrics.

Table (1): Variables description

Variable Description	Code in Model
Daily Sukuk Returns (Box-Cox transformed)	SUKUK_BC
U.S. Dollar Index (DXY)	LNDXY
Shariah Non-Compliance Risk Proxy (HQR) - Return spread between High-Quality Shariah-compliant sukuk and other sukuk	LNHQR
Credit Risk – High Yield Spread (SMB Proxy)	LNSMB

Source: Research Findings.

Descriptive statistics of the key variables from April 2015 to March 2025 are presented in Table (2). The values of SUKUK_BC show an almost similar distribution, with a very small distance between the peak (-0.568085) and the bottom (-0.568962) and an equally low standard deviation ($5.84E-05$), which represents a little variation from one day to another. This depicts the low-risk characteristic and returns stability of sukuk instruments in the sample period.

The log of the U.S. Dollar Index (LNDXY) varies moderately around a mean of 4.7547 with a standard deviation of 0.0452. The index varies between $[4.6446, 4.8692]$, matching periods of appreciation and depreciation by the dollar as observed on the respective graph.

The LNSMB variable, which is a proxy for credit risk, reports the largest spread of the covariates with minimum and maximum ranges equal to 0.9517 and 2.3860 and a standard deviation equal to 0.2502. This testifies to the significant variation in the credit risk premium through time, as the peaks and the valleys shown in the graph can testify.

Finally, LNHQR capturing Shariah compliance quality or governance-related risk is characterized by a relatively tight range (std. dev. = 0.0894) from a mean of 4.8257. Although it is stable, the time series graph shows that there is an increasing trend, even pointing to a rise across the decade to the Shariah standards.

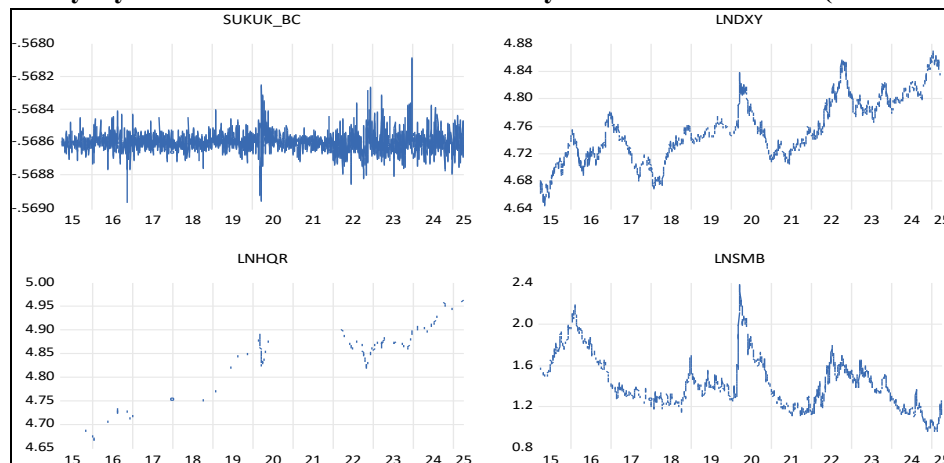
Table (2): Descriptive statistics

Variables	Mean	Maximum	Minimum	Std. Dev.
SUKUK_BC	-0.568599	-0.568085	-0.568962	5.84E-05
LNDXY	4.754724	4.869181	4.644585	0.045198
LNSMB	1.424304	2.386007	0.951658	0.250182
LNHQR	4.825721	4.965987	4.664665	0.089430

Source: Elaborated by the authors depending on EViews 13 outputs.

The time trends of these variables are also shown in Figure (1). Sukuk yields are not significantly different overall, while there are some small volatility jumps after 2020. On the other hand, the risk proxies (LNSMB, LNHQR, LNDXY) display more cyclical and trending characteristics, which suggests their potential ability in capturing variations in sukuk returns during different economic states.

Figure (1): Daily Dynamics of Sukuk Returns and Key Risk-Factor Proxies (2015 – 2025)



Source: EViews 13 outputs.

3-2 Econometric Modeling

This study employs the Nonlinear Autoregressive Distributed Lag (NARDL) model, as developed by (Shin and others, 2014, p. 281), to investigate the potential long-run asymmetric cointegration relationships between the dependent variable (SUKUK_BC) and the set of

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independent variables (LNDXY, LNHQR, LNSMB). The NARDL framework extends the traditional ARDL model by allowing for both short-run and long-run asymmetries through the decomposition of explanatory variables into their positive and negative partial sums.

Nonlinearity structure allows capturing the separate response to positive and negative change in the dependent variable on short-run dynamics and long-run adjustments. To estimate the model, cumulated positive (CUMDP) and negative (CUMDN) parts of each independent variable were created. The short-run effects are represented by the first-differenced components, and the long-run relationship is determined by the lagged-level terms in the error-correction specification.

The general specification for the estimated NARDL model is provided in Equation (1) in that the short-run dynamics are specified in terms of differenced variables in Equation (2), while the long-run relationship is formulated based on lagged-level terms in Equation (3). The proposal is a flexible dynamic specification with differing numbers of lags for each decomposed regressor, which are automatically selected based on the Akaike Information Criterion (AIC).

Estimated NARDL Model (Symbolic Form)

$$\begin{aligned} \Delta \text{SUKUK_BC}_t = & \alpha_0 + \alpha_1 \text{SUKUK_BC}_{t-1} + \alpha_2 \text{CUMDP_LNDXY}_{t-1} + \alpha_3 \text{CUMDN_LNDXY}_{t-1} \\ & + \alpha_4 \text{CUMDP_LNHQR}_{t-1} + \alpha_5 \text{CUMDN_LNHQR}_{t-1} \\ & + \alpha_6 \text{CUMDP_LNSMB}_{t-1} + \alpha_7 \text{CUMDN_LNSMB}_{t-1} \\ & + \sum (\beta_{1i} \Delta \text{SUKUK_BC}_{t-i}) + \sum (\beta_{2i} \Delta \text{CUMDP_LNDXY}_{t-i} + \beta_{3i} \Delta \text{CUMDN_LNDXY}_{t-i}) \\ & + \sum (\beta_{4i} \Delta \text{CUMDP_LNHQR}_{t-i} + \beta_{5i} \Delta \text{CUMDN_LNHQR}_{t-i}) \\ & + \sum (\beta_{6i} \Delta \text{CUMDP_LNSMB}_{t-i} + \beta_{7i} \Delta \text{CUMDN_LNSMB}_{t-i}) + \varepsilon_t \end{aligned} \quad (1)$$

Short-run Dynamics (Symbolic Form):

$$\begin{aligned} \Delta \text{SUKUK_BC}_t = & \alpha_0 + \lambda \text{EC}_{t-1} + \sum (\beta_{1i} \Delta \text{SUKUK_BC}_{t-i}) \\ & + \sum (\beta_{2i} \Delta \text{CUMDP_LNDXY}_{t-i} + \beta_{3i} \Delta \text{CUMDN_LNDXY}_{t-i}) \\ & + \sum (\beta_{4i} \Delta \text{CUMDP_LNHQR}_{t-i} + \beta_{5i} \Delta \text{CUMDN_LNHQR}_{t-i}) \\ & + \sum (\beta_{6i} \Delta \text{CUMDP_LNSMB}_{t-i} + \beta_{7i} \Delta \text{CUMDN_LNSMB}_{t-i}) + \varepsilon_t \end{aligned} \quad (2)$$

Cointegrating (Long-run) Equation:

$$\begin{aligned} \text{EC}_t = & \gamma_0 + \gamma_1 \text{CUMDP_LNDXY}_{t-1} + \gamma_2 \text{CUMDN_LNDXY}_{t-1} + \gamma_3 \text{CUMDP_LNHQR}_{t-1} + \gamma_4 \\ & \text{CUMDN_LNHQR}_{t-1} \\ & + \gamma_5 \text{CUMDP_LNSMB}_{t-1} + \gamma_6 \text{CUMDN_LNSMB}_{t-1} + \gamma_7 \text{SUKUK_BC}_{t-1} \end{aligned} \quad (3)$$

Notation:

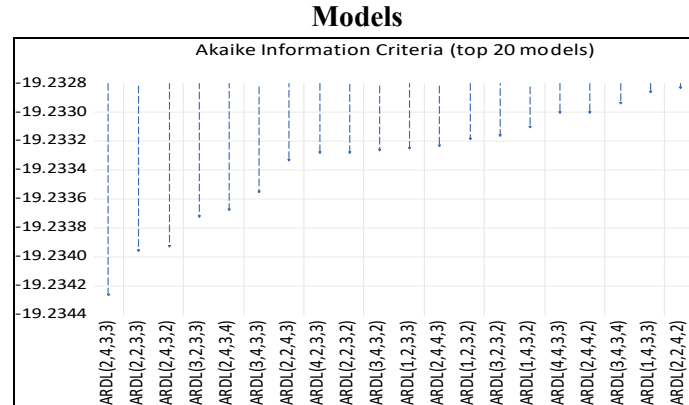
- CUMDP: Cumulative positive shocks.
- CUMDN: Cumulative negative shocks.
- Δ : First difference operator.
- ε_t : Error term.
- EC_t : Error correction term.
- Subscripts t and $t-i$ refer to time and lags respectively.

3-3 Optimal Lag Length for NARDL Model

To determine the optimal lag structure for the NARDL model, a preliminary set of linear ARDL models was estimated using the Akaike Information Criterion (AIC). The figure (2) displaying the top 20 ARDL models based on AIC identified ARDL(2,4,3,3) as the best-fitting specification. Accordingly (it minimized both the Akaike and Schwarz information criteria

across competing models), this lag configuration was adopted for the subsequent NARDL estimation. This approach is methodologically justified, as the NARDL framework is a nonlinear extension of the linear ARDL model, and optimal lag selection is typically based on linear models as a reliable preliminary benchmark.

Figure (2): Lag Order Selection for NARDL Estimation Based on AIC from Linear ARDL



Source: EViews 13 outputs

4- Results and Discussion

This section covers the main findings of the Nonlinear Autoregressive Distributed Lag (NARDL) modeling procedures

4-1 Stationarity Tests

To test for stationarity of the time series variables employed in the model we used the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) unit root tests. The results reported, in Table (3), show that the variable SUKUK_BC is stationary at level, that is, when they are put into the tests with a constant and trend, suggesting that SUKUK_BC is I(0). On the other hand, the other explanatory variables (LNDXY, LNSMB, and LNHQR) were non-stationary at level, but stationary after first difference and so they were integrated of order one, I(1).

To be more precise, the ADF and PP tests cannot reject the null hypothesis of a unit root at the level of these three variables based on every deterministic term. However, at the threshold of 1% the null is strongly rejected at the first difference, t-statistics being above the critical values. These findings for both tests support the robustness and validity of the determination of integration orders and hence validate the employment of the NARDL model that allows I(0), I(1), but not I(2) variables in the framework.

Therefore, the integration order of the data also confirms the justification of conducting a non-linear ARDL modeling and an asymmetric cointegration analysis.

Table (3): Unit root test results

Unit root test table (ADF)					
	<u>At level</u>	SUKUK-BC	LNDXY	LNSMB	LNHQR
None	t-Statistic	-0.039376	1.017675	-0.668076	2.462089
	Prob.	(0.6696)	(0.9193)	(0.4279)	(0.9970)
		no	no	no	no
Intercept	t-Statistic	-19.31849	-1.658424	-2.550252	-0.611031
	Prob.	(0.0000)	(0.4524)	(0.1038)	(0.8658)
		***	no	no	no
	t-Statistic	-19.31618	-2.865140	-2.913915	-1.441638

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Trend & Intercept	Prob.	(0.0000)	(0.1742)	(0.1581)	(0.8487)
		***	no	no	no
<u>At First Difference</u>		d(SUKUK-BC)	d(LNDXY)	d(LNSMB)	d(LNHQR)
None	t-Statistic	-22.04276	-47.88087	-30.94322	-19.15788
	Prob.	(0.0000)	(0.0001)	(0.0000)	(0.0000)
Intercept		***	***	***	***
	t-Statistic	-22.03829	-47.89182	-30.93817	-19.33640
Trend & Intercept	Prob.	(0.0000)	(0.0001)	(0.0000)	(0.0000)
		***	***	***	***
	t-Statistic	-22.03395	-47.88234	-30.93187	-19.33239
	Prob.	(0.0000)	(0.0000)	(0.0000)	(0.0000)
		***	***	***	***
Unit root test table (PP)					
<u>At level</u>		SUKUK-BC	LNDXY	LNSMB	LNHQR
None	t-Statistic	-0.196047	0.990648	-0.676814	2.281309
	Prob.	(0.6157)	(0.9155)	(0.4240)	(0.9950)
Intercept		no	no	no	no
	t-Statistic	-45.43826	-1.719565	-2.575767	-0.680965
Trend & Intercept	Prob.	(0.0001)	(0.4212)	(0.0982)	(0.8495)
		***	no	no	no
	t-Statistic	-45.43078	-3.001547	-2.952657	-1.560323
	Prob.	(0.0000)	(0.1319)	(0.1461)	(0.8083)
		***	no	no	no
<u>At First Difference</u>		d(SUKUK-BC)	d(LNDXY)	d(LNSMB)	d(LNHQR)
None	t-Statistic	-381.9810	-47.86675	-44.27177	-49.17755
	Prob.	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Intercept		***	***	***	***
	t-Statistic	-381.9362	-47.87532	-44.26400	-48.83132
Trend & Intercept	Prob.	(0.0001)	(0.0001)	(0.0001)	(0.0001)
		***	***	***	***
	t-Statistic	-381.9220	-47.86576	-44.25570	-48.82534
	Prob.	(0.0001)	(0.0000)	(0.0000)	(0.0000)
		***	***	***	***
Order of integration		I(0)	I(1)	I(1)	I(1)

Note: ***, **, and *: the level of significance of 1%, 5% and 10% respectively. And (no) Not Significant.

Source: Elaborated by the authors depending on EViews 13 outputs.

4.2 Nonlinearity and Independence Tests

To assess the presence of nonlinear dynamics within the proposed model, the BDS test (Brock-Dechert-Scheinkman test) was employed. This test is widely used to examine whether the residuals of a model are independently and identically distributed (i.i.d), which is a key assumption under linear modeling frameworks. A rejection of the null hypothesis indicates potential nonlinear dependence among variables.

To justify the NARDL framework, we conducted multiple validation tests. First, the BDS test confirmed nonlinear dependencies in the residuals (Table 4). Second, we performed formal

asymmetry tests using Wald statistics for both short-run and long-run asymmetry (Table 8). The significant asymmetry in Shariah compliance risk (LNHQ_R) at the 1% level ($p = 0.0003$) provides strong empirical justification for the NARDL approach. While some variables exhibited symmetric relationships, the presence of significant asymmetries in key determinants warranted the nonlinear specification.

Table (4) : BDS test results for Linearty or Independency of variables

Embedding Dimension (m)	BDS Statistic	Z Statistic
2	0.020238	11.25988
3	0.036726	12.86791
4	0.045066	13.59811
5	0.051295	14.50104
6	0.051857	15.21143

Source: Elaborated by the authors depending on EViews 13 outputs.

4-3 Co-integration test

The significant non-linear bounds test results presented in the table (5) provide substantial evidence of a long-run relationship of cointegration among the variables in the model. The computed F-statistic is 216.696, well above the upper bounds of critical value at any standard significant levels (10 percent, 5 percent, and 1 percent). In particular, the F-statistic is far from the I(1) critical value 3.990 at 1%. Thus, the null of no cointegration is neatly rejected. These results show a strong statistical evidence of a long-run asymmetric equilibrium relationship between SUKUK_BC and its determinants, thereby supporting the estimation and interpretation of long-run coefficients using the NARDL model.

Table (5) : ARDL Bound Test Results

Calculated F-statistics	216.695768		
Significance	Lower Bound I(0)	Upper Bound I(1)	Decision
10%	1.990	2.940	Cointegration
5%	2.270	3.280	Cointegration
1%	2.880	3.990	Cointegration

Note: I(0) and I(1) are respectively the stationary and non-stationary bounds.

Source: Elaborated by the authors depending on EViews 13 outputs.

4-4 NARDL model findings

From the table (6) results, we find that the positive and negative changes of U.S. dollar index (DLNDXY⁺(-1) and DLNDXY⁻(-1)) are not significant in impacting the sukuk, whose p-values are 0.9725 and 0.7930, respectively. This indicates that U.S. dollar fluctuations (both upward and downward) have no statistically significant long-run influence on sukuk returns. Therefore, sukuk performance appears relatively independent from dollar movements in the long run.

In contrast, Shariah non-compliance risk (DLNHQR⁺(-1)) has positive and highly significant effect at the 1% level ($p = 0.005$). This validates that compliance with the Shariah guidelines bolsters investor trust and supports the sukuk returns in the long run. In contrast, the negative coefficient on the reverse of the same index (DLNHQR⁻(-1)) is not significant indicating that

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deteriorations in Shariah quality do not elicit a similarly negative response - suggesting an investor bias for Shariah compliant instruments.

Regarding credit risk (DLNSMB), the results show significant effects for both positive and negative shocks, with the impact of negative shocks being stronger ($6.85\text{E-}06$; $p = 0.0028$) than that of positive shocks ($3.83\text{E-}06$; $p = 0.0145$). This suggests that an increase in credit spreads leads to a decline in sukuk returns, emphasizing the defensive nature of this market, which reacts more sensitively to credit deterioration than to improvements.

Last, the negative and highly significant constant ($C = -0.568609$; $p = 0.0000$) suggests a relatively low baseline level of returns, which may reflect the protected or limited return profile of sukuk compared to higher-risk, high-yield assets.

Table (6): NARDL Long-Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLNDXYt+(-1)	-4.08E-07	1.18E-05	-0.034496	0.9725
DLNDXYt-(-1)	-3.51E-06	1.34E-05	-0.262504	0.7930
DLNHQRt+(-1)	3.08E-05***	1.10E-05	2.806731	0.0050
DLNHQRt-(-1)	-4.73E-06	8.33E-06	-0.567876	0.5702
DLNSMBt+(-1)	3.83E-06**	1.57E-06	2.446175	0.0145
DLNSMBt-(-1)	6.85E-06***	2.29E-06	2.993625	0.0028
C	-0.568609***	1.28E-06	-445441.1	0.0000

Note: ***, **, and *: the level of significance of 1%, 5% and 10% respectively. And (no) Not Significant.

Source: Elaborated by the authors depending on EViews 13 outputs.

The main findings of our short run NARDL model results presented in table (7) are that the previous change in daily sukuk returns (Box-Cox transformed) has a statistically significant positive effect on the current change ($D(\text{SUKUK_BC}(-1)) = 0.045$; $p < 0.05$). This signifies the existence of short run price momentum in the sukuk market; where investors exhibit a persistent behavioral response to past return movements.

On the impact of the U.S. Dollar Index (DXY), results show a sharp asymmetry in market reaction: Positive shocks (DLNDXYt+) are not statistically significant (-0.000290 ; $p = 0.1148$), whereas negative shocks (DLNDXYt-) are significant at a 1%-level (-0.000674 ; $p < 0.01$). This indicates that the sukuk market is more sensitive to dollar falls compared with dollar rises, which is consistent with loss aversion (in which investors react more negatively to bad news). The influence of the Shariah Compliance Index (DLNHQR) which is the quality of high-grade Sukuk seems to be a strong and long lasting positive. Positive and negative shocks (DLNHQRt+ and DLNHQRt-) significantly raise Sukuk returns (all lags, $p < 0.01$), suggesting that under any deviation from Shariah compliance, investor trust is even reinforced and there is increased demand in the market—more so in Islamic or conventional financial culture.

As for credit risk, proxied by the High Yield Spread (DLNSMB), both positive and negative shocks (DLNSMBt+ and DLNSMBt-) exert significant and negative effects on Sukuk returns (-0.000152 and -0.000176 respectively; $p < 0.01$ for both). This result implies that the Sukuk market is highly sensitive to credit risk conditions: increases in spreads reduce returns, and even improvements in credit conditions do not lead to positive returns—highlighting the defensive and conservative nature of Sukuk instruments in risk-prone environments.

The error correction term $ECM(-1)$ is negative and statistically significant (-1.268 ; $p < 0.01$), suggesting a strong and stable long-run equilibrium relationship between the variables. The magnitude of the coefficient exceeds unity, indicating an over-adjustment process whereby deviations from the long-run equilibrium are more than fully corrected within a single period (interpreted here as approximately one trading day). This implies a fast and slightly aggressive convergence to equilibrium, reflecting a high degree of market efficiency in adjusting to shocks. This interpretation is also consistent with the fit data. The model accounts for almost 95% of the variation in $\Delta SUKUK_BC$ ($R^2 = 0.952$), no first-order autocorrelation being observed (Durbin-Watson ≈ 2) and the model as a whole being highly significant ($F = 2345.23$; $p < 0.01$). Furthermore, the Breusch–Godfrey LM test shows no additional serial correlation ($p = 0.25$). Although the White test indicates the existence of heteroskedasticity ($p = 0.0000$), this problem was solved by using the HAC (Newey-West) robust estimators, which correct for both heteroskedasticity and autocorrelation. Therefore, the statistical results can be considered reliable and valid for economic and econometric interpretation.

The results suggest that the Sukuk market is more sensitive to negative signals – from either the dollar index or credit risk – than to positive news, reflecting the careful conduct of investors and the defensive nature of Sukuk instruments. The lasting effect of the Shariah compliance index underscores the role of religious norms in shaping investor confidence. Finally, the high adjustment speed (as captured by the ECM) demonstrates the market's efficiency in absorbing information and correcting deviations, making Sukuk an attractive instrument for short-term hedging strategies.

Table (7) : NARDL Short-Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SUKUK_BC(-1))	0.045110**	0.019339	2.337344	0.0195
DLNDXYt+	-0.000290	0.000184	-1.577549	0.1148
DLNDXYt-	-0.000674***	0.000194	-3.483805	0.0005
DLNDXYt+(-1)	-0.000276	0.000192	-1.485530	0.1375
DLNDXYt-(-1)	-0.000947***	0.000194	-4.868926	0.0000
DLNDXYt+(-2)	0.000173	0.000184	0.943052	0.3457
DLNDXYt-(-2)	-0.000107	0.000196	-0.548373	0.5835
DLNDXYt+(-3)	-0.000299	0.000182	-1.719472	0.0857
DLNDXYt-(-3)	-0.000282	0.000181	-1.558419	0.1193
DLNHQRt+	0.042512***	0.000414	105.9192	0.0000
DLNHQRt-	0.030650***	0.000420	74.16511	0.0000
DLNHQRt+(-1)	0.010796***	0.000949	11.48301	0.0000
DLNHQRt-(-1)	0.011947***	0.000753	15.92030	0.0000
DLNHQRt+(-2)	0.002455***	0.000906	2.737460	0.0062
DLNHQRt-(-2)	-0.003412***	0.000766	4.104847	0.0000
DLNSMBt+	-0.000152***	2.71E-05	-5.636362	0.0000
DLNSMBt-	-0.000176***	3.17E-05	-5.708171	0.0000
DLNSMBt+(-1)	-8.82E-05***	2.75E-05	-3.251408	0.0012
DLNSMBt-(-1)	-6.55E-05	2.74E-05	-1.445796	0.1484
DLNSMBt+(-2)	-1.96E-07	2.78E-05	-0.007128	0.9943
DLNSMBt-(-2)	-6.50E-05**	3.14E-05	-2.120961	0.0340
ECM(-1)	-1.268357***	0.03042	-41.69522	0.0000
R-squared: 0.952188		Serial correlation : 1.374631		
Durbin-Watson: 1.992784		Prob. : 0.2531		
F-statistic: 2345.234		Heteroskedasticity : 37.61160		
Prob: 0.000000		Prob.: 0.000000		

Note: ***, **, and *: the level of significance of 1%, 5% and 10% respectively. And (no) Not Significant.

Source: Elaborated by the authors depending on EViews 13 outputs.

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To investigate whether one side of the relationship between sukuk returns and the explanatory variables is asymmetric, both short and long-run coefficient symmetry tests were performed represented in Table (8). The null hypothesis posits that there are symmetric coefficients such that positive and negative changes in the variables have the same magnitude of effect on the dependent variable.

In the long term, our results show that the null hypothesis of symmetry is not rejected for the dollar index (LNDXY) and the credit risk indicator (LNSMB) with p-values of 0.6246 and 0.0895 respectively. However, Shariah-compliance quality index (LNHQR) demonstrated slight asymmetry ($p = 0.0574$), therefore a slight nonlinear impact could be perceived between positive and negative change in the long run, even though it is not so significant.

In the short-run, strong evidence of asymmetry is detected for LNHQR ($p = 0.0001$), suggesting that the positive and negative impacts of the short-run shocks in Shariah-compliance perceptions on sukuk returns are not symmetric. BCAs for LNDXY and LNSMB were also non-significant ($p = 0.1798$ and 0.6238 , respectively), indicating symmetrical short-run dynamics.

The joint symmetry tests, which included long-run and short-run effects, corroborated asymmetry only for LNHQR ($p = 0.0003$), while symmetry prevailed for LNDXY ($p = 0.4063$) and LNSMB ($p = 0.2342$). This result reflects a special power of the Shariah-compliance sentiment as it affects investor reactions in the short-run in a unique manner.

Table (8): Summary of Coefficient Symmetry Test Results

Variable	Symmetry Test	Long-Run (p-value)	Short-Run (p-value)	Joint (p-value)	Symmetry Conclusion
LNDXY	F / Chi ²	0.6246	0.1798	0.4063	Symmetric
LNHQR	F / Chi ²	0.0574	0.0001	0.0003	Asymmetric
LNSMB	F / Chi ²	0.0895	0.6238	0.2342	Symmetric

Note: The null hypothesis assumes coefficient symmetry. P-values below 0.05 indicate statistically significant asymmetry.

Source: Elaborated by the authors depending on EViews 13 outputs.

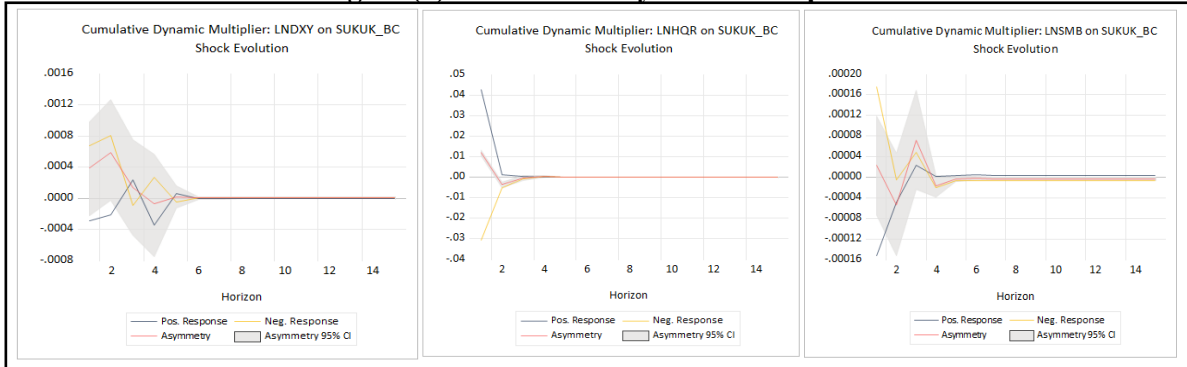
Figure (8) shows that the Cumulative dynamic multipliers were used to assess the long-run effects of positive and negative shocks in the explanatory variables on SUKUK_BC, accounting for asymmetry within the NARDL framework. The findings of this research indicate that the positive shocks in US dollar index (LNDXY) will cause a small upshot of average sukuk returns close to 0.0012, and a small falling during negative shocks. This indicates a slightly asymmetric relationship, though the overall economic impact is weak, such that the sukuk market overall seems to be less affected by dollar fluctuations.

In contrast, the evidence regarding the Shariah compliance index (LNHQR) shows a significant and strong asymmetric relation with sukuk returns. It is clear that positive shocks in LNHQR lead to substantial returns, which are higher than 0.04, while negative shocks result in a decrease of nearly -0.03. These results corroborate the importance of Shariah compliance of sukuk in their returns, and a worsening compliance level is associated with a significant negative impact.

As for the credit risk variable (LNSMB), the cumulative response of sukuk returns to positive and negative shocks is quite small and approximately symmetric, meaning that the credit-risk factor only slightly affected sukuk returns over the sample period.

Accordingly, the results suggest that the Shariah compliance index magnitude needs to be given due consideration in sukuk performance across the various markets, whereas the dollar index impact is relatively weak and credit risk here plays an insignificant role.

Figure (3): Cumulative Dynamic Multipliers



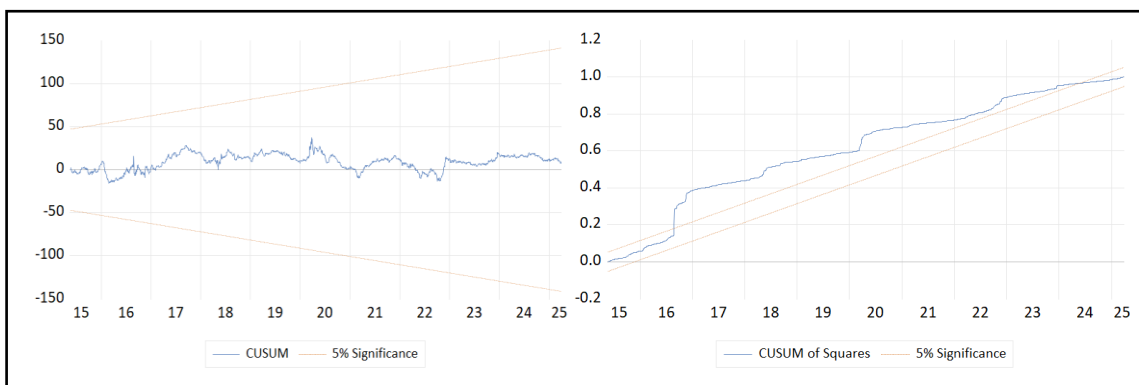
Source: EViews 13 outputs

4-5 The stability tests

The charts shown in figure (4) are for the CUSUM and CUSUM of Squares tests (by means of 5% critical lines), which are used to assess the parameter stability of the model over time. The first graph shows that the CUSUM line was always contained between the 5% lines of confidence during the entire sample period. This indicates that the coefficients of the model are stable, that there was no structural break that occurred during the study period, and that the model can be used as a reliable tool for forecasting the result.

Regarding the CUSUM of Squares test (second figure), even that the line of the test not lay within the confidence bands in all of the study periods, the stability has to be demonstrated either by CUSUM or CUSUM of Squares tests (Mouffok and others, 2025, p. 17). Therefore, the results confirm that the estimated model exhibits a high degree of structural stability, both in terms of coefficient consistency and error variance. This enhances confidence in the model's estimation accuracy and its ability to explain sukuk return dynamics during the study period.

Figure (4): Model stability results



Source: EViews 13 outputs

4-6 Discussion

The study's findings indicate a varied impact of key variables on the returns of the Sukuk index. The empirical results indicate that the U.S. Dollar Index (DXY) has no statistically significant long-run impact on Sukuk returns (p-values > 0.79 for both positive and negative shocks, as shown in Table 6). While minor fluctuations are observable in the short-run dynamics, particularly for dollar depreciation shocks, these effects lack statistical significance

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at conventional levels. This suggests that the global Sukuk market is less sensitive to fluctuations in the dollar compared to other asset classes. This could be attributed to the significant proportion of total Sukuk issuances that are DXY denominated, where the effect of variations in dollar value on return volatility is reduced. This outcome is consistent with (Sial and others, 2022) finding that Sukuk returns are less vulnerable to global shocks as compared to other assets.

However, the literature also confirms that in some outlying cases the rising dollar can have a negative impact on emerging markets. For example, according to (Mouffok and others, 2023, p. 9), the Russia–Ukraine war led to the strengthening of the U.S. dollar, which negatively impacted returns on emerging markets' assets, sukuku inclusive. In contrast, we find that robust dollar had a limited overall effect on Sukuk returns. This may suggest that the Sukuk market is relatively resilient or that other local characteristics, e.g. the nature of the Islamic finance market, have a greater impact on returns.

Conversely, Shariah non-compliance risk (HQR), measured as the return spread between high-quality compliant and other sukuk, demonstrates particularly strong and asymmetric effects on returns. This confirms that investors price compliance risk explicitly in sukuk valuations. Good (bad) improvements in compliance have significant positive (negative) effects on returns. This corroborates assertions in earlier studies about the pivotal role of investor confidence and Shariah compliance in the Sukuk market. Crucially, this hypersensitivity manifests not only in the magnitude of responses but also in their speed: our error-correction model ($ECM = -1.26$) indicates that deviations from equilibrium are over-corrected within a single trading day—a finding aligned with high-frequency Islamic finance studies (Naifar, 2018, p. 8). This 'overshooting' adjustment pattern is economically plausible in Islamic financial markets, where Shariah compliance considerations can trigger immediate portfolio rebalancing.

This rapid adjustment mechanism explains why investors punish non-compliance more severely than they reward improvements—a behavioral asymmetry consistent with loss aversion in religiously sensitive assets (Jallow & Joof, 2020, p. 14).

With respect to SMB factor (representing credit risk), we observe weak and balanced impacts in both directions (positive or negative), suggesting credit spread changes are less relevant to Sukuk returns over the selected period. This weak influence of SMB stands in contrast with some prior findings that credit risk is positively related to Sukuk returns (Abdul Rauf, 2016, p. 13). This discrepancy might be a result of the composition of our sample, which is concentrated on investment-grade Sukuk where credit spread volatility is generally lower or due to stable global credit environment throughout the sample period.

Overall, this discussion shows that identity-specific factors in Islamic finance (e.g., compliance with Shariah), play a larger role in the determination of the return of Sukuk than more global variables (i.e., currency robustness or the conventional credit danger). This provides a deeper understanding of the dynamics of the Sukuk market in both the short and long term.

Conclusion:

Applying a Nonlinear Autoregressive Distributed Lag (NARDL) approach, this study quantifies the asymmetric effects the U.S. Dollar Index (DXY), Shariah compliance risk

(HQR), and credit risk (SMB) on the Dow Jones Sukuk Total Return Index (ex-Reinvestment) using daily data spanning March 2015 to March 2025.

Given the above results, it can be inferred that Shariah compliance (HQR) is the leading factor influencing the returns of Sukuk. It is an important channel for return volatility and has an asymmetric influence that signals investor sensitivity to adherence to Shariah compliance. On the other hand, the impact of the U.S. Dollar Index (DXY) on the Sukuk market is small, and the impact of credit risk (SMB) is very small and not statistically significant but economically limited. These findings imply that the Sukuk market enjoys a relative degree of independence from certain global fluctuations, relying more on factors intrinsic to the nature of Islamic financial instruments. This independence manifests not only in reduced sensitivity to global shocks but also in distinctive market dynamics: our finding of a high-speed error correction ($ECM = -1.26$) is not a statistical anomaly but a feature of Islamic fixed-income markets during volatile periods. This 'overshooting' mechanism reflects how Shariah-compliance imperatives accelerate market adjustments.

On the basis of this analysis, the research offers several theoretical and practical suggestions.

At the theoretical level, economic models should be developed to incorporate the nonlinear nature of Sukuk market interactions, especially with respect to the Shariah compliance, to better understand how the market itself is responsive to this type of religious trust shock.

On the practical level, regulators as well as Sukuk issuers should work to increase transparency and rigor towards Shariah standards in structuring Sukuk where it has proven to be a positive driver of investor confidence and return stability. Furthermore, while the observed effect of exchange rate dynamics was insignificant, the paper calls for the support of risk-hedging instruments to insulate against possible exchange rate jolts, particularly under extraordinary geopolitical occurrences like the Russia-Ukraine war, which could rekindle the dollar's magnetic power to recapture emerging markets, including Sukuk

Moreover, the study underscores the necessity of deepening Sukuk secondary markets to activate and enhance efficiency toward enhancing liquidity and cushioning shocks. It would be a dynamic secondary market, providing investors the ability to rapidly adjust their portfolios in response to market volatility and contributing to price and return stability.

The paper suggests broader research on other markets and judging horizons for the purposes of investigating the generalizability of findings. It would also be interesting to include other variables, such as geopolitical factors or sectoral index, which could affect the returns of the Sukuk. It might also assist in making more comparisons between Sukuk and conventional bonds under the same economic shock in order to determine their special features and benefits.

This paper fills a gap in the literature by demonstrating a relative influence on Sukuk returns between international and domestic parameters, respectively. It paves the way for future studies to develop our knowledge on how Islamic financial markets influence and are influenced by a dynamic global financial landscape.

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