

Structural Macroeconomic Transmission and the Indonesian Islamic Capital Market: Evidence from a Structural Vector Autoregression Before and During the COVID-19 Pandemic

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Abstract: The Indonesian Islamic capital market has experienced rapid development over the last decade, yet its vulnerability to macroeconomic disturbances remains insufficiently understood. While previous studies have examined the effects of macroeconomic variables on Islamic stock markets, most rely on reduced-form econometric models that are unable to distinguish structural shocks or identify changes in transmission mechanisms during periods of economic disruption. This study investigates how Gross Domestic Product (GDP), the Bank Indonesia policy rate (BI Rate), and the Rupiah–US dollar exchange rate dynamically influence the Indonesian Sharia Stock Index (ISSI) before and during the COVID-19 pandemic. Monthly data covering the period 2015–2023 are analyzed using a Structural Vector Autoregression (SVAR) framework. The empirical analysis incorporates unit root tests, Johansen cointegration, Vector Error Correction Model (VECM), Granger causality, Impulse Response Functions (IRF), and Forecast Error Variance Decomposition (FEVD) to identify structural relationships and evaluate the dynamic responses of ISSI to macroeconomic shocks across two economic regimes. The findings reveal a substantial shift in the transmission mechanism following the COVID-19 outbreak. Prior to the pandemic, ISSI fluctuations were largely explained by internal market dynamics, whereas macroeconomic variables mainly affected the long-run equilibrium. During the pandemic, exchange rate shocks emerged as the largest contributor to ISSI volatility (27.24%), followed by the BI Rate (21.13%) and GDP (17.97%), indicating a structural transition toward greater macroeconomic dependence. The IRF results further demonstrate that ISSI responds asymmetrically to macroeconomic shocks and requires several periods to converge to a new equilibrium. This study contributes to the Islamic finance literature in three ways. First, it applies a Structural VAR framework to identify structural macroeconomic transmission in the Indonesian Islamic capital market. Second, it provides empirical evidence that the COVID-19 pandemic fundamentally reshaped the transmission mechanism from internally driven market dynamics toward macroeconomically driven fluctuations. Third, it proposes the Structural Macroeconomic Transmission for Islamic Capital Market Stability (SMT-Sharia) model as a conceptual framework to support macroprudential policy and enhance the resilience of Islamic capital markets in emerging economies.

Keywords: Islamic capital market; Indonesian Sharia Stock Index; Structural VAR; Macroeconomic transmission; COVID-19; Exchange rate.

Introduction

The rapid expansion of Islamic finance has fundamentally reshaped the global financial architecture over the past two decades. Once primarily concentrated in banking, Islamic finance has evolved into a comprehensive financial ecosystem encompassing Islamic capital markets, sukuk, takaful, investment funds, and other Shariah-compliant financial instruments. According to the latest global industry reports, Islamic financial assets have exceeded USD 4 trillion and continue to grow steadily, reflecting increasing demand for ethical, asset-backed, and risk-sharing financial products across both Muslim-majority and non-Muslim jurisdictions. This development indicates that Islamic finance has become an integral component of the international financial system rather than a niche alternative to conventional finance. The expansion has also attracted growing academic interest regarding the resilience, efficiency, and macroeconomic role of Islamic financial markets during periods of economic uncertainty.

Unlike conventional financial systems that predominantly rely on interest-based intermediation, Islamic finance is governed by Shariah principles prohibiting *riba* (interest), *gharar* (excessive uncertainty), and *maysir* (speculation). Instead, Islamic finance emphasizes profit-and-loss sharing, asset-backed transactions, and ethical investment practices that are expected to strengthen financial stability and improve the linkage between the financial and real sectors. These distinctive characteristics have encouraged researchers to investigate whether Islamic financial markets demonstrate greater resilience than conventional markets during episodes of financial distress. Several empirical studies suggest that Shariah-compliant assets generally exhibit relatively stronger resilience during periods of heightened uncertainty because their underlying firms tend to maintain lower leverage ratios and stronger connections with productive economic activities, although their performance remains influenced by macroeconomic conditions and global financial shocks (Ashraf, 2020; Naifar, 2016).

Among the various segments of Islamic finance, the Islamic capital market has become one of the fastest-growing sectors worldwide. Islamic equity markets facilitate long-term capital formation while ensuring compliance with Shariah investment screening criteria. International Islamic equity benchmarks, including the Dow Jones Islamic Market Index, FTSE Shariah Index Series, MSCI Islamic Indexes, and S&P Shariah Index, have substantially expanded the accessibility of Shariah-compliant investments for institutional and retail investors. Consequently, Islamic stock markets have increasingly become integrated into global financial systems, making them more exposed to international capital flows, monetary policy spillovers, and macroeconomic uncertainty.

Indonesia occupies a particularly important position within this global development. As the country with the world's largest Muslim population, Indonesia has experienced remarkable growth in its Islamic financial industry over the last decade. The Indonesian Islamic capital market has expanded significantly through continuous regulatory reforms, increasing investor participation, product diversification, and improvements in market infrastructure. The Indonesian Sharia Stock Index (ISSI), introduced by the Indonesia Stock Exchange in 2011, represents all Shariah-compliant listed equities and has become the primary benchmark for evaluating the performance of Indonesia's Islamic equity market. The strategic importance of ISSI extends beyond its function as a stock market index because it also reflects the development of Islamic investment activities and the broader integration of Islamic finance into Indonesia's national financial system. These developments are consistent with Indonesia's long-term roadmap for strengthening Islamic financial markets and enhancing sustainable economic growth.

Although Islamic capital markets operate under distinctive Shariah principles, they remain closely connected with macroeconomic fundamentals. Corporate profitability, investment decisions, portfolio allocation, and investor expectations are simultaneously influenced by real economic performance, monetary policy, and exchange rate movements. Gross Domestic Product (GDP) represents the overall condition of the real economy and provides essential information regarding firms' future earnings prospects. Higher economic growth generally improves corporate profitability, strengthens investor confidence, and stimulates stock market appreciation. Conversely, contraction in economic activity reduces expected cash flows and increases uncertainty regarding future corporate performance.

Monetary policy constitutes another important transmission channel affecting Islamic equity markets. Changes in the Bank Indonesia policy rate influence the cost of capital, investment financing, credit conditions, and investors' portfolio decisions. According to monetary transmission theory, higher policy interest rates increase the attractiveness of fixed-income financial instruments while simultaneously raising corporate financing costs, thereby exerting downward pressure on stock prices. Exchange rate fluctuations further affect firms through export competitiveness, imported production costs, foreign capital movements, and macroeconomic expectations. Consequently, movements in GDP, interest rates, and exchange rates jointly shape the dynamics of stock market performance, including Islamic equity markets operating within emerging economies.

Previous empirical evidence generally confirms that macroeconomic variables significantly influence Islamic stock market performance, although the magnitude and direction of these relationships vary considerably across countries and market conditions. Ajmi et al. (2014) documented long-run interactions between Islamic stock markets and macroeconomic fundamentals across several emerging economies using cointegration techniques. Likewise, Naifar (2016) demonstrated that global risk factors and macroeconomic uncertainty significantly affect Islamic financial markets through multiple transmission channels. More recent studies further indicate that Islamic financial markets remain sensitive to monetary policy shocks, exchange rate volatility, and international financial uncertainty despite their distinctive institutional characteristics. These findings suggest that Islamic stock markets cannot be analysed independently from broader macroeconomic developments but should instead be viewed as integral components of national and global financial systems.

The COVID-19 pandemic represents one of the most disruptive global crises since the Global Financial Crisis (GFC) of 2008. Unlike previous financial crises that primarily originated from weaknesses within the financial sector, COVID-19 simultaneously generated supply-side disruptions, demand contractions, international trade restrictions, labor market instability, and unprecedented monetary and fiscal policy responses. Consequently, financial markets around the world experienced exceptional volatility as investors rapidly reassessed macroeconomic prospects under conditions of extreme uncertainty. Emerging economies were particularly vulnerable because pandemic-induced uncertainty coincided with capital outflows, exchange rate depreciation, and declining economic activity, thereby amplifying macro-financial instability (Ashraf, 2020; Baker et al., 2020).

Within this environment, Islamic capital markets faced substantial challenges despite their distinctive institutional characteristics. Although Shariah-compliant equities exclude firms with excessive leverage and speculative activities, Islamic stock markets remain closely integrated with the real economy through corporate earnings, trade performance, exchange rate movements, and monetary policy. Consequently, Islamic financial assets cannot be assumed to be immune from severe macroeconomic shocks. Instead, their resilience depends on the interaction between Islamic financial principles and broader macroeconomic conditions. Recent empirical evidence indicates that Islamic equity markets generally outperformed conventional markets during the initial

stages of the COVID-19 pandemic because of their lower financial leverage and sectoral composition. However, this relative resilience gradually weakened as the pandemic evolved and macroeconomic uncertainty intensified (Ashraf, 2020; Yarovaya et al., 2021).

Indonesia provides an especially relevant context for examining these issues. During the pandemic, the Indonesian economy experienced its deepest contraction since the Asian Financial Crisis, accompanied by substantial depreciation of the Rupiah, aggressive monetary easing by Bank Indonesia, and considerable volatility in domestic financial markets. These macroeconomic developments altered investment behaviour, portfolio allocation, and corporate performance across virtually all sectors of the economy. Consequently, it is reasonable to expect that the transmission mechanism linking macroeconomic variables and the Indonesian Sharia Stock Index (ISSI) may have changed fundamentally during the pandemic rather than merely becoming more volatile. Indeed, the empirical results of this study indicate that before COVID-19, ISSI fluctuations were largely explained by internal market dynamics, whereas during the pandemic exchange rate shocks, monetary policy shocks, and GDP shocks jointly became the dominant determinants of ISSI volatility, indicating a structural transformation in the macroeconomic transmission mechanism.

Despite the rapidly growing literature on Islamic finance and financial market resilience during COVID-19, several important research gaps remain unresolved.

First, a methodological gap exists. Most previous studies examining the relationship between macroeconomic variables and Islamic stock markets employ reduced-form econometric models such as Ordinary Least Squares (OLS), Autoregressive Distributed Lag (ARDL), Vector Autoregression (VAR), or Vector Error Correction Models (VECM). While these approaches are useful for identifying dynamic relationships and long-run equilibrium, they are unable to distinguish structural shocks from contemporaneous correlations because the reduced-form residuals represent mixtures of multiple economic disturbances. Consequently, these models provide limited insights into the underlying transmission mechanisms through which macroeconomic shocks affect Islamic equity markets (Kilian & Lütkepohl, 2017).

Second, an empirical gap remains. Existing studies predominantly investigate whether GDP, interest rates, exchange rates, inflation, or oil prices influence Islamic stock markets. However, considerably less attention has been devoted to quantifying the relative contribution of each structural macroeconomic shock in explaining stock market volatility over time. Understanding the dominant sources of volatility is essential for policymakers because different macroeconomic shocks require different stabilization policies. Forecast Error Variance Decomposition (FEVD) within the Structural VAR framework offers a more informative approach by decomposing stock market fluctuations into identifiable structural components rather than reduced-form innovations.

Third, a contextual gap persists. The majority of empirical studies focus either on cross-country Islamic stock market indices or on developed financial markets. Comparatively few studies investigate Indonesia despite its strategic importance as the world's largest Muslim-majority country and one of the fastest-growing Islamic capital markets. Indonesia's dual financial system, unique institutional framework, evolving monetary policy regime, and rapidly expanding Islamic investment sector imply that evidence obtained from other jurisdictions cannot automatically be generalized to the Indonesian context.

Fourth, a temporal gap remains largely unexplored. Numerous COVID-19 studies analyse stock market reactions during the pandemic without explicitly comparing the transmission mechanism before and during the crisis. Such approaches implicitly assume that macroeconomic relationships remain stable over time, whereas major crises frequently generate structural breaks that permanently alter economic behaviour. Consequently, empirical evidence capable of identifying changes in macroeconomic transmission across different economic regimes remains relatively scarce within the Islamic finance literature.

Addressing these four gaps constitutes the principal motivation of this study. Specifically, this research employs a Structural Vector Autoregression (SVAR) framework to investigate the dynamic relationship among Gross Domestic Product (GDP), the Bank Indonesia policy rate, the Rupiah–US Dollar exchange rate, and the Indonesian Sharia Stock Index before and during the COVID-19 pandemic. Compared with conventional VAR models, SVAR enables economically meaningful identification of structural shocks by imposing theoretically justified contemporaneous restrictions. This approach therefore provides more reliable evidence regarding the direction, persistence, and relative importance of macroeconomic disturbances affecting Islamic capital market performance.

Accordingly, this study pursues four specific objectives. First, it analyses the dynamic relationship between GDP, the BI policy rate, the exchange rate, and ISSI across two distinct economic regimes. Second, it identifies the impulse responses of ISSI to structural macroeconomic shocks using the Impulse Response Function (IRF). Third, it evaluates the relative contribution of each macroeconomic variable to ISSI volatility through Forecast Error Variance Decomposition (FEVD). Finally, based on these empirical findings, the study develops the Structural Macroeconomic Transmission for Islamic Capital Market Stability (SMT-Sharia Model) as a conceptual framework explaining how macroeconomic transmission mechanisms evolve under conditions of structural economic disruption. The model synthesizes interactions among the real sector, monetary policy, exchange rate stability, and Islamic capital markets to provide a more comprehensive perspective on financial

stability within emerging Islamic economies. This conceptual contribution is also one of the principal novelties of the underlying dissertation.

This study contributes to the literature in three important ways. First, it extends Islamic capital market research by applying a Structural VAR framework capable of identifying structural macroeconomic shocks rather than merely estimating reduced-form dynamic relationships. Second, it provides empirical evidence demonstrating that the COVID-19 pandemic fundamentally reshaped macroeconomic transmission mechanisms affecting the Indonesian Islamic capital market, shifting the dominant determinants of ISSI volatility from internal market dynamics toward external macroeconomic factors. Third, it proposes the SMT-Sharia Model as an integrative conceptual framework linking macroeconomic stability and Islamic capital market resilience, thereby offering theoretical insights as well as practical implications for central banks, financial regulators, policymakers, and institutional investors operating in emerging Islamic financial systems.

Method

1. Research Design

This study employs a quantitative research design to examine the dynamic interactions between macroeconomic fundamentals and the Indonesian Islamic capital market. The empirical analysis is based on the Structural Vector Autoregression (SVAR) framework, which enables the identification of economically meaningful structural shocks while accounting for the dynamic interdependence among multiple endogenous variables. Compared with conventional regression models, SVAR provides a richer representation of macro-financial relationships because it captures both contemporaneous interactions and dynamic feedback effects among economic variables.

The choice of the SVAR approach is motivated by three considerations. First, macroeconomic variables and stock market indicators interact simultaneously, making single-equation models susceptible to endogeneity bias. Second, the COVID-19 pandemic represents an exogenous structural disturbance that potentially altered macroeconomic transmission mechanisms. Third, SVAR allows structural identification of economic shocks, enabling impulse response analysis and variance decomposition based on theoretically justified restrictions rather than purely statistical correlations (Kilian & Lütkepohl, 2017). Accordingly, this study estimates separate structural models for two different economic regimes, namely the pre-pandemic period and the COVID-19 pandemic period. Estimating the models separately facilitates the investigation of possible structural changes in the transmission of macroeconomic shocks to the Indonesian Sharia Stock Index (ISSI).

2. Data and Variables

The empirical analysis utilizes monthly time-series data covering the period from January 2015 to December 2023. The observation period is subsequently divided into two sub-periods to distinguish the macroeconomic transmission mechanism before and during the COVID-19 pandemic, consistent with the objective of identifying regime-dependent structural relationships.

Four endogenous variables are included in the SVAR system:

Table 1. SVAR System's endogenous variables

Variable	Symbol	Measurement	Source
Indonesian Sharia Stock Index	ISSI	Index value	Indonesia Stock Exchange (IDX)
Gross Domestic Product	GDP	Monthly interpolated real GDP	Statistics Indonesia (BPS)
BI Policy Rate	BIR	Percent	Bank Indonesia
Exchange Rate	EXR	Rupiah per US Dollar	Bank Indonesia

ISSI represents the overall performance of the Indonesian Islamic equity market and serves as the dependent variable in the structural transmission system. GDP reflects aggregate real economic activity and captures the performance of the real sector. The BI policy rate represents monetary policy conditions, while the Rupiah–US Dollar exchange rate reflects external competitiveness and international capital movements.

Monthly GDP observations are obtained through temporal disaggregation of quarterly GDP data following standard interpolation procedures commonly adopted in macroeconomic time-series analysis to ensure consistency across all variables. All variables are transformed into natural logarithms where appropriate to stabilize variance and facilitate elasticity interpretation.

3. Econometric Framework

The empirical analysis follows a sequential econometric procedure.

Unit Root Test: Because macroeconomic time-series often exhibit stochastic trends, the stationarity properties of each variable are first examined using the Augmented Dickey-Fuller (ADF) test. The ADF specification is expressed as

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \sum_{i=1}^p \delta_i \Delta y_{t-1} + \varepsilon_t$$

where y_t denotes the observed time series, p represents the optimal lag length, and ε_t is the white-noise disturbance term. The null hypothesis indicates the presence of a unit root, whereas rejection implies stationarity.

Optimal Lag Selection: The optimal lag order is determined using several information criteria, including Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SC), Hannan–Quinn Criterion (HQ), and Final Prediction Error (FPE). Selecting an appropriate lag structure is essential to avoid model misspecification while preserving sufficient degrees of freedom.

Johansen Cointegration Test: When variables are integrated of the same order, long-run equilibrium relationships are investigated using Johansen's multivariate cointegration procedure.

The Johansen trace statistic is given by

$$\lambda_{trace} = -T \sum_{i=r+1}^n \ln(1 - \lambda_i)$$

where:

T denotes sample size,

r is the number of cointegrating vectors,

λ_i represents the ordered eigenvalues.

Evidence of cointegration implies that the variables share common stochastic trends and therefore require estimation within the Vector Error Correction Model (VECM) framework prior to structural identification.

Structural VAR Specification: Following the reduced-form VAR estimation, the Structural VAR (SVAR) model is identified by imposing contemporaneous restrictions derived from macroeconomic theory. The structural representation of the model is expressed as follows:

$$A_0 Y_t = A_1 Y_{t-1} + \dots + A_p Y_{t-p} + B \varepsilon_t$$

where $Y_t = (ISSI_t, GDP_t, BIR_t, EXR_t)^1$ denotes the vector of endogenous variables, representing the Islamic stock price index, gross domestic product, Bank Indonesia Rate, and exchange rate, respectively. The matrix A_0 captures the contemporaneous interactions among these variables, B is the structural matrix that transforms the orthogonal innovations, and ε_t represents the vector of mutually independent structural shocks, assumed to be white noise with a variance-covariance matrix normalized to an identity matrix, $E[\varepsilon_t \varepsilon_t'] = I$

Unlike reduced-form residuals, these structural disturbances possess direct economic interpretations, thereby allowing the identification of specific macroeconomic transmission channels. To achieve identification, the contemporaneous restrictions are imposed on matrix A_0 based on standard macroeconomic theory and informational assumptions:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 \\ a_{41} & a_{42} & a_{43} & 1 \end{bmatrix} \begin{bmatrix} ISSI \varepsilon_t \\ GDP \varepsilon_t \\ BIR \varepsilon_t \\ EXR \varepsilon_t \end{bmatrix} = B \begin{bmatrix} ISSI \varepsilon_t \\ GDP \varepsilon_t \\ BIR \varepsilon_t \\ EXR \varepsilon_t \end{bmatrix}$$

Under this Cholesky ordering scheme, real economic activity (GDP) is assumed to respond sluggishly to shocks within the same period (e.g., a month or quarter), meaning it does not react contemporaneously to monetary or financial shocks. In contrast, monetary policy (BIR) reacts contemporaneously to innovations in the real economy, while forward-looking financial variables, namely the exchange rate (EXR) and the Islamic stock index ($ISSI$) adjust immediately to all new information arriving in the market. This recursive identification strategy follows the widely accepted practice in empirical SVAR literature for analyzing monetary policy transmission mechanisms.

Impulse Response Function: The Impulse Response Function (IRF) evaluates the dynamic response of $ISSI$ to one-standard-deviation structural shocks originating from GDP , monetary policy, exchange rates, and its own innovations. Unlike reduced-form impulse responses, structural IRFs isolate economically interpretable shocks, allowing the persistence, magnitude, and direction of macroeconomic transmission to be analysed over time. The analysis provides evidence regarding: response direction, adjustment speed, persistence, convergence toward long-run equilibrium.

Forecast Error Variance Decomposition: Forecast Error Variance Decomposition (FEVD) measures the proportion of $ISSI$ forecast error variance attributable to each structural shock over different forecasting horizons. FEVD enables identification of the dominant drivers of Islamic stock market volatility. Particular attention is

devoted to comparing FEVD results between the pre-pandemic regime and the COVID-19 regime, thereby revealing whether the pandemic altered the macroeconomic sources of stock market fluctuations.

Robustness and Diagnostic Tests: Several diagnostic procedures are conducted to ensure model reliability. Specifically, LM serial correlation test, heteroskedasticity test, Jarque–Bera normality test, inverse roots stability test, are performed before structural interpretation. Only stable SVAR systems satisfying all diagnostic requirements are subsequently used for IRF and FEVD analyses.

4. Identification Strategy

A fundamental advantage of the Structural Vector Autoregression (SVAR) framework over reduced-form VAR models lies in its ability to identify economically meaningful structural shocks. However, identification requires theoretically justified contemporaneous restrictions that distinguish structural innovations from reduced-form residuals. Without such restrictions, the estimated impulse responses merely reflect statistical correlations and cannot be interpreted as causal macroeconomic transmission mechanisms (Kilian & Lütkepohl, 2017).

This study identifies the structural model by imposing short-run contemporaneous restrictions derived from macroeconomic theory, monetary transmission mechanisms, and financial market behavior. The ordering of variables follows the sequence:

GDP→*BI Rate*→*Exchange Rate*→*ISSI*

This ordering reflects the assumption that macroeconomic production adjusts relatively slowly within a monthly observation period, whereas monetary policy responds to contemporaneous macroeconomic developments but not immediately to stock market fluctuations. Exchange rates are assumed to adjust more rapidly than real economic output because foreign exchange markets continuously incorporate new information regarding monetary policy and international capital movements. Finally, the Indonesian Sharia Stock Index (ISSI) is assumed to respond contemporaneously to all macroeconomic innovations because financial markets process information almost instantaneously.

The recursive identification can therefore be represented through the following contemporaneous structural matrix, where the lower triangular structure indicates that GDP is contemporaneously exogenous, the BI policy rate responds immediately to GDP innovations, the exchange rate reacts contemporaneously to both GDP and monetary policy shocks, while ISSI immediately incorporates information from all macroeconomic variables.

The identification assumptions are supported by conventional macroeconomic theory. Real output is generally characterized by adjustment rigidities because production, employment, and investment decisions require time to respond to unexpected shocks. Consequently, GDP is treated as the most predetermined variable within each monthly observation period. In contrast, central banks continuously monitor macroeconomic indicators when determining policy interest rates. Although monetary authorities may react rapidly to changes in economic conditions, policy decisions are generally not revised within the same month solely because of temporary stock market fluctuations.

Foreign exchange markets exhibit considerably faster adjustment mechanisms than the real sector. Exchange rates rapidly incorporate expectations regarding monetary policy, international capital flows, trade performance, and global financial sentiment. Numerous empirical studies have documented that exchange rates typically respond within hours or even minutes to macroeconomic announcements, making them substantially more flexible than aggregate production indicators.

Finally, stock markets represent the most information-sensitive component of the macro-financial system. Under the Efficient Market Hypothesis (EMH), publicly available information concerning economic growth, monetary policy, and exchange rate movements is rapidly incorporated into equity prices. Consequently, ISSI is assumed to respond contemporaneously to structural innovations originating from all macroeconomic variables, while feedback from ISSI to GDP or monetary policy occurs only with a lag. This assumption is particularly appropriate for monthly data because real-sector adjustment generally requires longer periods than financial market price discovery.

The imposed contemporaneous restrictions are consistent with previous empirical applications of SVAR in monetary economics and financial market analysis (Bernanke, 1986; Christiano, 2012; Kilian & Lütkepohl, 2017; Sims, 1986). Moreover, these restrictions closely reflect the institutional characteristics of the Indonesian economy, where Bank Indonesia formulates monetary policy based primarily on inflation, economic growth, and exchange rate stability, whereas equity markets react immediately to macroeconomic announcements and policy decisions.

Following identification, structural shocks are recovered through orthogonalization of the reduced-form residuals. The identified shocks are subsequently employed to estimate Impulse Response Functions (IRFs) and Forecast Error Variance Decompositions (FEVDs), thereby allowing the dynamic transmission of macroeconomic disturbances to the Indonesian Islamic capital market to be analysed under both the pre-pandemic and COVID-19 regimes.

5. Structural Break and Regime Definition

The primary objective of this study is to investigate whether the macroeconomic transmission mechanism affecting the Indonesian Islamic capital market changed following the outbreak of the COVID-19 pandemic. Rather than assuming parameter stability throughout the entire observation period, this study explicitly recognizes the pandemic as an extraordinary exogenous shock that potentially generated a structural break in the relationship between macroeconomic variables and Islamic stock market performance.

Structural breaks refer to permanent changes in the underlying data-generating process caused by major economic, political, or financial events. When structural breaks are ignored, parameter estimates obtained from a single econometric model may become biased and statistically unstable because the estimated coefficients merely represent averages across different economic regimes (Bai & Perron, 2003; Perron, 1989). Consequently, identifying regime changes constitutes an essential step in macroeconomic time-series analysis.

The COVID-19 pandemic represents a unique structural shock because it simultaneously disrupted economic production, international trade, financial markets, labor mobility, and monetary policy across virtually all economies. Unlike ordinary business cycle fluctuations, the pandemic induced abrupt and synchronized changes in macroeconomic conditions, thereby altering investors' expectations and financial market dynamics worldwide (Baker et al., 2020).

In Indonesia, the first officially confirmed COVID-19 cases were announced by the national government on 2 March 2020, marking the beginning of widespread policy interventions including mobility restrictions, fiscal stimulus packages, monetary easing, and financial market stabilization measures. These policy responses fundamentally changed the macroeconomic environment within which investors formed expectations and allocated financial assets. Consequently, March 2020 represents a meaningful economic breakpoint separating the pre-pandemic regime from the pandemic regime.

Accordingly, the empirical analysis estimates two independent SVAR systems:

Table 2

Economic Regime	Observation Period	Economic Characteristics
Pre-pandemic	January 2015 – February 2020	Relatively stable macroeconomic conditions and conventional monetary transmission
COVID-19 period	March 2020 – December 2023	Extraordinary macroeconomic uncertainty, accommodative monetary policy, exchange rate volatility, and pandemic-related economic disruption

Estimating separate models instead of incorporating a simple dummy variable is motivated by the expectation that the pandemic affected not only the intercept but also the entire dynamic transmission mechanism among macroeconomic variables. Separate estimation therefore allows all coefficients, contemporaneous interactions, impulse responses, and variance decompositions to differ across regimes, providing a more comprehensive understanding of structural change.

This approach is consistent with previous macro-financial studies that treat major crises as regime-switching events rather than temporary shocks. Estimating independent structural systems before and during crises enables researchers to identify whether economic relationships remain stable or evolve under different macroeconomic environments (Kilian & Lütkepohl, 2017; Lütkepohl, 2007).

Furthermore, the validity of the estimated SVAR models is evaluated through a series of post-estimation diagnostic procedures. The inverse roots of the autoregressive characteristic polynomial are examined to ensure dynamic stability, while residual serial correlation and heteroskedasticity tests are conducted to verify that the estimated structural models satisfy the underlying econometric assumptions. Only stable models are subsequently interpreted through Impulse Response Functions (IRFs) and Forecast Error Variance Decompositions (FEVDs).

Results and Discussion

1. Descriptive Statistics

The dataset consists of 102 monthly observations covering the period from January 2015 to June 2023, including the Indonesian Sharia Stock Index (ISSI), Gross Domestic Product (GDP), the Bank Indonesia policy rate (BI Rate), and the Rupiah–US Dollar exchange rate. The sample is subsequently divided into the pre-pandemic period (2015–2019) and the COVID-19 period (2020–2023) to investigate possible changes in macroeconomic transmission mechanisms.

Table 3. Descriptive Statistics

Variable	ISSI	PDB	BIR	EXR
Mean	177,955	1.280.390,990	5,118	14.091,127
Median	178,940	1.273.524,500	4,750	14.132,000
Maximum	217,730	1.787.790	7,750	15.628
Minimum	133,990	898.530	3,500	12.640
Std. Dev.	19,602	232.108,116	1,308	684,336
Skewness	-0,285	0,455	0,529	0,143
Kurtosis	2,624	2,429	2,230	2,265
Jarque-Bera	1,980	4,908	7,267	2,642
Probability	0,372	0,086	0,026	0,267
Observations	102	102	102	102

Source: EViews 13 output, processed (2026)

Overall, ISSI recorded an average value of 177.96 points, with a minimum of 133.99 and a maximum of 217.73, indicating moderate fluctuations throughout the observation period. The standard deviation (19.60) remained considerably lower than the mean, suggesting that the Indonesian Islamic equity market exhibited relatively stable dynamics despite experiencing substantial uncertainty during the COVID-19 pandemic.

GDP exhibited the largest absolute dispersion because economic activity evolved considerably over the study period, particularly during the pandemic-induced economic contraction followed by gradual recovery. Meanwhile, the BI Rate averaged 5.12%, reflecting several monetary policy adjustments implemented by Bank Indonesia in response to inflationary pressures, exchange-rate developments, and macroeconomic conditions. The exchange rate displayed the highest volatility among the macroeconomic variables, highlighting the sensitivity of the Indonesian Rupiah to global financial conditions, international capital movements, and pandemic-related uncertainty.

The distributional characteristics further indicate that all variables exhibit moderate skewness (within ± 1), suggesting the absence of severe asymmetry. Kurtosis values below three imply relatively flat (platykurtic) distributions. Although the Jarque-Bera statistic indicates that the BI Rate slightly departs from normality, this does not invalidate the subsequent VAR/VECM estimation because multivariate time-series models primarily require stationarity and model stability rather than strict normality of individual variables.

Overall, the descriptive statistics reveal substantial heterogeneity across variables, implying that each macroeconomic indicator may contribute differently to Islamic stock market dynamics. These preliminary findings justify the subsequent investigation using the Structural VAR framework.

2. Stationarity and Cointegration Analysis

Before estimating the Structural VAR model, the stochastic properties of the variables were examined using the Augmented Dickey-Fuller (ADF) unit root test. Ensuring stationarity is a prerequisite for dynamic time-series modelling because non-stationary variables may generate spurious regression results.

Table 4. Summary of Stationarity Test Results (pre-pandemic)

Variable	ADF Statistic	Critical Value (5%)	First Difference (Prob.)	Derajat Integrasi	Result
ISSI	-6,971919	-2,912631	0,0000	I(1)	Stasioner
PDB	-10,592227	-2,917650	0,0000	I(1)	Stasioner
BIR	-5,710237	-2,912631	0,0000	I(1)	Stasioner
EXR	-7,716706	-2,912631	0,0000	I(1)	Stasioner

Source: EViews 13 output, processed (2026)

The ADF results indicate that ISSI, GDP, the BI Rate, and the exchange rate are all non-stationary at their levels. However, after first differencing, all variables become stationary at the 1% significance level, indicating that they are integrated of order one, I(1). Specifically, ISSI records an ADF statistic of -6.97, GDP -10.59, BI Rate -5.71, and the exchange rate -7.72 after first differencing, with all associated probability values equal to 0.0000.

The common integration order permits investigation of long-run equilibrium relationships using Johansen's cointegration procedure

Table 5. Johansen Trace Test (pre-pandemic)

Hipotesis	Trace Statistic	Critical Value 5%	Prob	Keputusan
None	51,6849	47,8561	0,0209	Reject the null hypothesis

				(H ₀)
At most 1	26,0249	29,7971	0,1280	Accept the null hypothesis (H ₀)

Source: EViews 13 output, processed (2026)

The Johansen Trace Test rejects the null hypothesis of no cointegration (Trace Statistic = 51.68; $p = 0.0209$), while the "At Most 1" hypothesis cannot be rejected, indicating the existence of one cointegrating vector. Although the Maximum Eigenvalue statistic provides weaker evidence, the Trace Test is generally considered more robust in determining the cointegration rank in multivariate systems. Consequently, the presence of one long-run equilibrium relationship justifies the estimation of a Vector Error Correction Model (VECM) prior to structural identification.

Prior to estimation, the optimal lag length was determined using multiple information criteria. The Likelihood Ratio (LR), Final Prediction Error (FPE), and Akaike Information Criterion (AIC) consistently selected three lags, whereas the Schwarz Criterion (SC) and Hannan–Quinn Criterion (HQ) suggested one lag. Following the majority rule and considering the monthly frequency of the data, a lag length of three was adopted.

Table 6. Interpretation of Optimum Lag Results (pre-pandemic)

Lag	LR	FPE	AIC	SC	HQ
1	471.5630	6.40E+12	40.83633	41.56627*	41.11860*
2	31.17060	5.87E+12	40.74052	42.05442	41.24862
3	27.56271*	5.58E+12*	40.66609*	42.56393	41.40000
4	18.99466	6.35E+12	40.74805	43.22984	41.70778
5	17.52313	7.35E+12	40.81448	43.88022	42.00003

Source: EViews 13 output, processed (2026)

Stability diagnostics further confirm that all characteristic roots lie inside the unit circle, indicating that the VAR system is dynamically stable and suitable for subsequent Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) analyses.

3. Long-Run Relationship

The estimated VECM provides evidence of significant long-run relationships between macroeconomic fundamentals and the Indonesian Islamic capital market. The cointegrating equation indicates that GDP, the BI Rate, and the exchange rate all exert statistically significant long-run effects on ISSI.

Table 7. Log-run Relationship (pre-pandemic)

Variable	Coefisien	t-statistic	Conclusion
PDB	0,000291	-5,39	Significant
BIR	11,2327	-2,80	Significant
EXR	-0,0762	5,44	Significant

Source: EViews 13 output, processed (2026)

Specifically, the long-run coefficients associated with GDP, the BI Rate, and the exchange rate are statistically significant based on their respective t -statistics, confirming that macroeconomic fundamentals jointly determine the long-run equilibrium of the Indonesian Islamic equity market.

Table 8. Error Correction Term (ECT)-pre pandemic

Error Correction:	D(ISSI)	D(PDB)	D(BIR)	D(EXR)
COINTEQ1	-0.0126	-142.9151	0.0077	-4.9388
	0.0713	139.7971	0.0026	2.8208
	[-0.17690]	[-1.02230]	[2.96446]	[-1.75087]

Source: EViews 13 output

Nevertheless, the estimated error correction coefficient in the ISSI equation is negative but statistically insignificant (ECT = -0.0126 ; $t = -0.177$), suggesting that short-run deviations from long-run equilibrium are corrected only slowly during the pre-pandemic period. This finding implies that while macroeconomic variables shape the long-term behaviour of the Islamic stock market, short-term market movements remain largely driven by internal market dynamics rather than immediate macroeconomic adjustments.

4. Impulse Response Analysis

Impulse Response Functions (IRFs) were employed to evaluate the dynamic adjustment of the Indonesian Sharia Stock Index (ISSI) following one-standard-deviation structural shocks originating from GDP, the BI policy rate, the exchange rate, and the index itself. Unlike static coefficient estimates, IRFs illustrate both the direction and persistence of macroeconomic transmission, thereby providing a richer understanding of how Islamic equity markets absorb economic disturbances over time.

Response of ISSI to Its Own Shock: The results reveal that ISSI exhibits a strong and persistent response to its own innovations throughout the forecasting horizon.

Table 9. Response of ISSI (pre-pandemic)

Period	ISSI	GDP	BIR	EXR
1	5.5841	0	0	0
2	5.9083	0.0077	-0.4814	-0.0529
3	6.8516	-1.3992	-0.0524	-0.1530
4	5.7255	-1.5683	0.5205	0.3924
5	5.3925	-2.3045	0.5344	0.5524
6	4.6008	-1.9211	0.5350	0.8929
7	4.5566	-1.8564	0.5334	0.7287
8	4.5180	-1.4510	0.5003	0.8623
9	4.7475	-1.3226	0.5067	0.6052
10	4.8680	-1.2118	0.5025	0.5783

Source: EViews 13 output

The initial response reaches approximately 5.58 in the first period, increases to 6.85 by the third period, and subsequently declines gradually before converging toward a new equilibrium.

This pattern indicates that the Indonesian Islamic equity market possesses a high degree of internal persistence. In other words, fluctuations in ISSI are initially driven more by endogenous market dynamics including investor sentiment, portfolio rebalancing, and expectations regarding future profitability than by contemporaneous macroeconomic shocks.

From a financial economics perspective, this finding is consistent with the Efficient Market Hypothesis (Fama, 1970), which argues that stock prices continuously incorporate available information. Nevertheless, because investor expectations evolve gradually rather than instantaneously, market adjustments often display persistence before reaching a new equilibrium. Similar persistence has been documented in Islamic equity markets by Ashraf et al. (2020), who argue that Shariah-compliant equity markets exhibit relatively strong internal resilience during periods of heightened uncertainty.

The dominance of own shocks also reflects the unique institutional characteristics of the Indonesian Islamic capital market. Unlike conventional equity markets, ISSI consists exclusively of firms satisfying Shariah screening criteria, thereby reducing excessive leverage and speculative activities. Consequently, market dynamics are influenced not only by macroeconomic fundamentals but also by the composition and behavioural characteristics of Shariah-compliant investors.

Response of ISSI to GDP Shocks: The response of ISSI to GDP shocks differs markedly from its response to internal innovations. After the initial period, ISSI responds negatively to positive GDP shocks, reaching its largest decline around the fifth period before gradually recovering.

Table 10. Response of ISSI to GDP Shocks (pre-pandemic)

Period	ISSI	GDP	BIR	EXR
1	-280.4755	10950.3215	0	0
2	72.6395	14999.7004	1840.1205	-2949.5503
3	597.8685	19669.4958	3023.3650	-4316.4430
4	1206.5526	20290.6752	3187.3095	-7226.8868
5	282.7747	19894.7174	2287.2945	-6988.4247
6	-834.5561	18465.3624	1978.8426	-6520.3644
7	-1586.8165	17375.3583	2186.2530	-4714.4250
8	-1927.9920	16727.8355	2594.4327	-3314.5148
9	-1992.6164	16635.4223	3196.3459	-2356.9521
10	-2180.2510	16791.2579	3703.9181	-1900.5574

Source: EViews 13 output

At first glance, this finding appears counterintuitive because conventional valuation theory predicts that stronger economic growth should improve corporate earnings and consequently increase stock prices. However, the Indonesian Islamic capital market exhibits several characteristics that help explain this negative short-run response.

First, improvements in aggregate economic activity are not immediately translated into higher earnings for firms represented in the Islamic equity index. During the pre-pandemic period, Indonesian economic growth was largely supported by sectors whose contributions were not fully reflected in the composition of ISSI constituents. Consequently, aggregate GDP growth generated only limited immediate benefits for Shariah-compliant listed firms.

Second, macroeconomic information is typically incorporated into equity prices with a certain degree of delay. Investors require time to evaluate whether stronger GDP growth is sustainable, whether it may trigger tighter monetary policy, and whether higher production costs could offset future profitability. These considerations generate temporary uncertainty, resulting in a short-run negative market response despite favourable macroeconomic news.

This evidence supports the VECM results, which indicate that GDP contributes significantly to the long-run equilibrium relationship while exerting only limited short-run influence on ISSI.

Response of ISSI to Monetary Policy Shocks: The impulse responses reveal an interesting non-linear adjustment following monetary policy shocks. Initially, ISSI responds negatively to increases in the BI policy rate. However, after approximately four periods, the response becomes positive and gradually stabilizes throughout the remaining forecasting horizon.

Table 11. Response of ISSI to Monetary Policy Shock (pre-pandemic)

Period	ISSI	GDP	BIR	EXR
1	-0.03932	0.0442	0.1935	0
2	-0.1220	0.0210	0.1822	0.0486
3	-0.2030	0.0401	0.1836	0.0642
4	-0.2652	0.0539	0.2025	0.0716
5	-0.2890	0.0557	0.2001	0.1270
6	-0.2975	0.0726	0.2156	0.1436
7	-0.2904	0.0734	0.2339	0.1622
8	-0.2995	0.0745	0.2442	0.1821
9	-0.3104	0.0699	0.2576	0.1921
10	-0.3288	0.0674	0.2671	0.2089

Source: EViews 13 output

The initial negative reaction is fully consistent with conventional monetary transmission theory. Higher policy interest rates increase the opportunity cost of equity investment by improving the relative attractiveness of interest-bearing financial instruments while simultaneously raising firms' financing costs. Consequently, equity valuations decline immediately following restrictive monetary policy shocks.

Nevertheless, the negative response proves to be temporary. As market participants gradually adjust their expectations, the Islamic equity market begins to interpret tighter monetary policy as a signal of macroeconomic stability and successful inflation management. Greater confidence regarding future economic conditions eventually offsets the initial contractionary effect of higher interest rates, allowing ISSI to recover and respond positively.

This finding illustrates that monetary policy affects Islamic equity markets through multiple transmission channels rather than a single direct mechanism. The short-run liquidity effect is gradually replaced by improved macroeconomic credibility, generating a reversal in investor expectations over time.

Response of ISSI to Exchange Rate Shocks: ISSI initially exhibits only a modest negative response following exchange-rate shocks before turning positive after the fourth period and reaching its strongest response around the sixth period.

Table 12. Response of ISSI to Exchange Rate Shocks (pre-pandemic)

Period	ISSI	GDP	BIR	EXR
1	-156.8818	-32.3780	24.8541	150.2439
2	-154.0564	37.3802	105.9265	89.9428
3	-146.8297	78.7584	107.6010	78.3188
4	-155.2525	112.5960	65.8703	44.6511
5	-153.3689	128.2501	67.2017	8.8578
6	-150.7924	121.6012	56.7242	15.9781

7	-142.5963	112.4439	51.044	20.0363
8	-135.8162	104.2537	54.5527	23.1731
9	-133.4983	95.1460	55.1129	32.1585
10	-135.2779	92.0637	58.0217	35.7647

Source: EViews 13 output

The dynamic adjustment suggests that exchange-rate depreciation does not necessarily weaken the Indonesian Islamic equity market. While a depreciating Rupiah increases import costs for many firms, it simultaneously improves international competitiveness for export-oriented companies included in ISSI. Consequently, the net impact of exchange-rate movements depends on the industrial composition of Shariah-compliant firms and investors' expectations regarding future external demand.

Moreover, exchange-rate movements also signal broader macroeconomic conditions. Moderate depreciation may stimulate export revenues and improve corporate cash flows, whereas excessive depreciation could generate inflationary pressures and increase financial uncertainty. The positive medium-term response observed in the IRF therefore indicates that investors eventually interpret exchange-rate adjustments as part of broader macroeconomic adaptation rather than purely adverse economic shocks.

The IRFs further demonstrate substantial heterogeneity in the behaviour of the remaining endogenous variables. GDP responds predominantly to its own innovations, indicating strong persistence in real economic activity. Similarly, the BI policy rate exhibits gradual adjustment following monetary disturbances, reflecting the relatively systematic conduct of monetary policy by Bank Indonesia. Exchange-rate dynamics also remain largely self-driven during the early forecasting periods, although interactions with GDP and monetary policy become increasingly important over longer horizons.

These results collectively indicate that macroeconomic variables possess different adjustment speeds. Financial variables such as ISSI and the exchange rate react almost immediately to new information, whereas GDP adjusts considerably more slowly owing to production rigidities, investment planning, and consumption behaviour. This pattern closely corresponds to standard macroeconomic theory, which distinguishes between fast-moving financial markets and gradually adjusting real-sector variables.

Taken together, the impulse response analysis demonstrates that the Indonesian Islamic capital market exhibited substantial resilience during the pre-pandemic period. Internal market dynamics remained the dominant source of short-run fluctuations, whereas macroeconomic shocks influenced ISSI more gradually through delayed transmission mechanisms. GDP shocks generated persistent negative responses during much of the forecasting horizon, while monetary policy and exchange-rate shocks initially produced adverse effects before gradually becoming positive as markets adjusted to new macroeconomic conditions.

These findings provide important evidence that Islamic equity markets are neither completely insulated from macroeconomic disturbances nor mechanically driven by them. Instead, macroeconomic information is transmitted through multiple channels that evolve over time, highlighting the importance of analysing dynamic adjustment rather than relying solely on contemporaneous regression coefficients.

5. Forecast Error Variance Decomposition-pre pandemic

Forecast Error Variance Decomposition (FEVD) complements the impulse response analysis by quantifying the relative importance of each structural shock in explaining the forecast error variance of endogenous variables over time. While the IRF identifies the direction and persistence of dynamic responses, FEVD measures the proportion of volatility attributable to each source of disturbance, thereby providing a clearer picture of the dominant transmission channels operating within the macroeconomic system.

Table 13. Variance Decomposition of ISSI (pre-pandemic)

Period	S.E.	ISSI	GDP	BIR	EXR
1	5.584137	100	0	0	0
2	8.144061	99.64622	8.92E-05	0.34946	0.004227
3	10.73564	98.07513	1.698628	0.203492	0.022754
4	12.28495	96.61871	2.92698	0.334895	0.119411
5	13.63455	94.08033	5.233061	0.42552	0.261087
6	14.5548	92.55158	6.334377	0.508533	0.605506
7	15.39047	91.53922	7.120133	0.574932	0.765718
8	16.13626	91.11292	7.285801	0.619155	0.982127
9	16.89052	91.05737	7.262762	0.655098	1.024772

10	17.6364	91.137	7.133523	0.68204	1.04744
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Source: EViews 13 output

Table 13 reports the variance decomposition of ISSI over a ten-period forecasting horizon. The results indicate that, in the very short run, fluctuations in the Indonesian Islamic stock market are explained almost entirely by innovations originating from the market itself. During the first period, 100% of ISSI forecast error variance is explained by its own shocks, indicating complete dominance of endogenous market dynamics.

As the forecasting horizon expands, the contribution of ISSI's own innovations gradually declines but remains overwhelmingly dominant. By the tenth period, approximately 91.14% of ISSI volatility continues to be explained by internal shocks, whereas GDP contributes 7.13%, the exchange rate 1.05%, and the BI policy rate 0.68%. These findings indicate that, prior to the COVID-19 pandemic, the Indonesian Islamic equity market was characterized primarily by endogenous dynamics rather than macroeconomic disturbances. Investor sentiment, portfolio adjustments, firm-specific information, and market expectations constituted the principal drivers of short- and medium-term price fluctuations. Macroeconomic variables played a supporting rather than dominant role in determining market behaviour.

This evidence reinforces the impulse response analysis, which demonstrated that macroeconomic shocks required several periods before exerting meaningful effects on ISSI. Together, the IRF and FEVD suggest that macroeconomic information was incorporated gradually into Islamic stock prices, reflecting delayed transmission rather than immediate market adjustment.

Table 14. Variance Decomposition of GDP (pre-pandemic)

Period	S.E.	ISSI	GDP	BIR	EXR
1	10953.91	0.065562	99.93444	0	0
2	18896.31	0.023509	96.59176	0.948285	2.436452
3	27786.5	0.057168	94.78044	1.622452	3.539944
4	35322	0.152059	91.65288	1.818286	6.376775
5	41201.86	0.116466	90.6755	1.644531	7.563503
6	45669.36	0.128188	90.151	1.52627	8.194538
7	49164.18	0.214784	90.28003	1.514737	7.990448
8	52138	0.327724	90.56872	1.594486	7.509072
9	54907.66	0.427194	90.84135	1.776561	6.954894
10	57609.74	0.531286	91.01492	2.027179	6.426616

Source: EViews 13 output

Although macroeconomic variables collectively explain less than 10% of ISSI variance during the pre-pandemic period, GDP emerges as the most influential external determinant. Its contribution increases steadily from virtually zero during the first period to more than 7% after ten periods. The gradual increase suggests that real economic activity primarily influences Islamic equity prices through long-run channels rather than immediate market reactions. Improvements in aggregate production eventually enhance corporate profitability, increase investment opportunities, and strengthen expectations regarding future cash flows. However, these effects materialize only after investors have accumulated sufficient macroeconomic information and adjusted their expectations accordingly.

This behaviour is fully consistent with the estimated VECM, which identified GDP as an important determinant of long-run equilibrium despite its limited short-run influence. Consequently, the Indonesian Islamic capital market appears to respond to economic fundamentals in a relatively gradual manner, reflecting the slower adjustment process typically associated with real-sector developments.

Table 15 Variance Decomposition of BIR (pre-pandemic)

Period	S.E.	ISSI	GDP	BIR	EXR
1	0.202348	3.776418	4.779164	91.44442	0
2	0.303044	17.90466	2.609811	76.9164	2.569134
3	0.415337	33.4265	2.321634	60.49125	3.760622
4	0.540239	43.85249	2.367468	49.79906	3.980979
5	0.659294	48.66693	2.302666	42.64732	6.383084

6	0.771734	50.38386	2.564991	38.92964	8.121512
7	0.875412	50.16432	2.696903	37.3932	9.74558
8	0.976903	49.67925	2.74728	36.27406	11.29941
9	1.076484	49.22552	2.684328	35.60154	12.48861
10	1.177487	48.94237	2.57161	34.90113	13.58488

Source: EViews 13 output

The BI policy rate contributes only marginally to ISSI volatility throughout the forecasting horizon, reaching less than 1% after ten periods. This relatively small contribution suggests that conventional monetary policy transmission into the Islamic equity market remained limited during the pre-pandemic period. Several institutional characteristics may explain this finding. First, Islamic equity investors generally focus on firms operating under Shariah principles, whose financial structures typically involve lower leverage than conventional firms. Consequently, changes in benchmark interest rates may have weaker effects on expected corporate profitability. Second, monetary policy primarily influences financial markets indirectly through inflation expectations, exchange-rate adjustments, and broader macroeconomic stability rather than through immediate valuation effects. Therefore, although interest-rate changes influence investor behaviour, their overall contribution to Islamic stock market volatility remains relatively modest compared with internal market dynamics.

Table 16. Variance Decomposition of EXR (pre-pandemic)

Period	S.E.	ISSI	GDP	BIR	EXR
1	221.023	50.38136	2.145974	1.26451	46.20816
2	305.4373	51.82146	2.621459	12.68936	32.86772
3	372.5126	50.37575	6.232449	16.87459	26.51722
4	426.4733	51.68674	11.72555	15.26012	21.32759
5	475.8614	51.90225	16.68158	14.25124	17.16493
6	517.1482	52.44794	19.65333	13.26968	14.62906
7	550.8416	52.92933	21.48953	12.55468	13.02646
8	579.8745	53.24768	22.62388	12.21403	11.91441
9	605.9707	53.61361	23.18257	12.01187	11.19195
10	631.3652	53.97835	23.48146	11.90957	10.63062

Source: EViews 13 output

The contribution of exchange-rate shocks also increases gradually over time, although it remains smaller than that of GDP. By the end of the forecasting horizon, exchange-rate innovations explain approximately 1.05% of ISSI variance. The relatively limited contribution reflects the diversified composition of companies included in ISSI. While currency depreciation negatively affects import-dependent firms through higher production costs, it simultaneously benefits export-oriented companies by improving international competitiveness. The net effect therefore becomes relatively balanced at the aggregate market level. Furthermore, exchange-rate fluctuations during the pre-pandemic period remained relatively well managed under Bank Indonesia's macroeconomic stabilization framework. Consequently, exchange-rate volatility was insufficient to become a dominant source of systematic risk for the Islamic capital market.

The decomposition results further reveal considerable persistence in the remaining endogenous variables. GDP remains overwhelmingly self-driven, with more than 91% of its forecast variance still explained by its own innovations after ten periods. This finding indicates that real economic activity evolves largely according to domestic production dynamics rather than financial market developments.

Similarly, the BI policy rate is initially dominated by its own innovations, although the relative contribution of ISSI increases over time. By the tenth period, almost half of the variation in monetary policy can be associated with developments in the Islamic equity market, suggesting increasing interaction between financial markets and monetary authorities as new information accumulates.

The exchange rate exhibits the most interconnected behaviour among all macroeconomic variables. Interestingly, ISSI explains more than half of exchange-rate variance over longer forecasting horizons, whereas the contribution of the exchange rate's own innovations declines substantially. This finding implies that capital-market developments and investor confidence became increasingly important determinants of exchange-rate movements during the pre-pandemic period.

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Most importantly, these findings establish a benchmark against which the COVID-19 period can be evaluated. If the pandemic fundamentally altered macroeconomic transmission mechanisms, one would expect the dominance of internal ISSI shocks observed during the pre-pandemic period to weaken, with macroeconomic variables accounting for a substantially larger share of market volatility. This hypothesis is examined in the following section through a comparative analysis of the pandemic regime.

6. Comparative Dynamic Transmission Before and During COVID-19

A central objective of this study is to determine whether the COVID-19 pandemic fundamentally altered the macroeconomic transmission mechanism linking GDP, monetary policy, exchange rates, and the Indonesian Islamic capital market. To address this question, separate Structural VAR models were estimated for the pre-pandemic and pandemic periods, allowing all dynamic relationships to vary across economic regimes rather than imposing constant parameters throughout the sample.

The comparative evidence demonstrates a clear structural transformation in the behaviour of the Indonesian Islamic capital market. Before the pandemic, ISSI fluctuations were overwhelmingly driven by endogenous market dynamics. During this period, more than 91% of ISSI forecast error variance continued to originate from its own innovations even after ten forecasting periods (see table 13), while macroeconomic variables collectively explained only a relatively small proportion of market volatility.

Table 17. Variance Decomposition of ISSI during COVID-19

Periode	ISSI	GDP	BIR	EXR
1	100,00	0	0	0
5	56,80	8,01	3,68	31,52
10	33,65	17,97	21,13	27,24

Source: Data processed using EViews 13 (2026)

This pattern changed substantially during the COVID-19 period. As documented in the dissertation findings, exchange-rate shocks became the single largest external source of ISSI volatility, contributing 27.24% of forecast error variance, followed by the BI policy rate (21.13%) and GDP (17.97%). Consequently, macroeconomic shocks collectively accounted for well over half of the total variation in the Indonesian Islamic equity market during the pandemic, indicating that market dynamics became increasingly dependent on external macroeconomic conditions rather than internal market behaviour.

This transition represents considerably more than a simple increase in market volatility. Instead, it indicates a structural reorganization of the macroeconomic transmission mechanism itself. Under normal economic conditions, investor behaviour appears to be primarily influenced by firm-level information, market sentiment, and portfolio allocation decisions. During the pandemic, however, investment decisions became increasingly driven by macroeconomic uncertainty, exchange-rate instability, monetary policy interventions, and expectations regarding economic recovery.

Table 18

Periods	ISSI's response to shocks:			
	ISSI	GDP	BIR	EXR
1	5,38			
2	3,51	0,16	-1,02	-0,72
3	1,19	-0,50	-0,14	-2,85
4	1,43	1,31	-0,44	-2,83
5	0,92	2,10	-1,30	-2,94
6	0,81	2,83	-2,42	-3,19

7	1,65	2,93	-3,02	-2,67
8	2,11	2,53	-3,21	-1,97
9	2,24	1,77	-2,75	-1,67
10	2,31	1,22	-2,05	-1,53

Source: Data processed using EViews 13 (2026)

The impulse response analysis further supports this interpretation. Prior to the pandemic, responses of ISSI to macroeconomic shocks were generally modest and temporary. GDP shocks generated gradual negative responses, whereas shocks to the BI policy rate and exchange rate initially produced adverse effects before eventually becoming positive as market participants adjusted their expectations. These response patterns suggest that the Islamic equity market possessed sufficient resilience to absorb macroeconomic disturbances without experiencing persistent instability.

The pandemic fundamentally altered this adjustment process. The unprecedented deterioration in economic activity, combined with extraordinary monetary easing and heightened exchange-rate volatility, substantially increased investors' sensitivity to macroeconomic information. As a result, financial market expectations became closely linked to policy announcements, exchange-rate movements, and indicators of economic recovery. Rather than responding primarily to firm-specific fundamentals, investors increasingly relied on macroeconomic signals when valuing Shariah-compliant equities.

These findings are broadly consistent with the global financial literature documenting the exceptional role of COVID-19 as a systemic macroeconomic shock. Baker et al. (2020) argue that the pandemic simultaneously disrupted production, financial markets, labour mobility, and investor expectations, thereby generating unprecedented increases in economic uncertainty. Similarly, Ashraf et al. (2020) demonstrate that Islamic equity markets, although relatively resilient compared with many conventional markets, remained highly responsive to major macroeconomic disturbances during the pandemic. The present study extends this literature by identifying the specific transmission channels through which these macroeconomic shocks propagated within the Indonesian Islamic capital market.

From a policy perspective, the empirical evidence suggests that maintaining Islamic capital market stability during systemic crises requires a coordinated macroeconomic policy framework rather than isolated interventions. Exchange-rate stabilization emerges as the most influential policy priority during crisis periods because currency volatility rapidly propagates throughout the Islamic equity market. Monetary policy also assumes a substantially greater role by influencing investor expectations regarding liquidity conditions and economic recovery. Meanwhile, sustainable GDP growth remains essential for restoring long-term market confidence, although its influence materializes more gradually than financial variables.

7. Emergence of the SMT-Sharia Model

The comparative evidence obtained from the two Structural VAR models provides the foundation for a new conceptual framework termed the Structural Macroeconomic Transmission for Islamic Capital Market Stability (SMT-Sharia Model). Rather than viewing GDP, monetary policy, exchange rates, and the Islamic capital market as independent components of the financial system, the empirical findings demonstrate that these variables operate as an integrated transmission network whose relative importance changes according to prevailing macroeconomic conditions. The novelty of this conceptual model is also highlighted in the dissertation as one of its principal contributions.

Under normal economic conditions, transmission originates primarily within the Islamic capital market itself, with macroeconomic variables exerting relatively weak indirect effects. Financial stability is therefore maintained largely through internal market mechanisms, including investor confidence, portfolio diversification, and firm-specific fundamentals.

During periods of systemic crisis, however, the transmission mechanism undergoes a fundamental reconfiguration. Exchange-rate instability becomes the dominant transmission channel, monetary policy assumes an increasingly important stabilizing role, and GDP influences market behaviour through expectations regarding future economic recovery. The Islamic capital market therefore evolves from a relatively autonomous financial system into one that is substantially dependent on macroeconomic stabilization policies.

This regime-dependent transmission mechanism represents the principal theoretical contribution of the present study. Unlike previous research that generally estimates a single dynamic relationship across the entire sample period, the present analysis demonstrates that macroeconomic transmission is itself conditional upon the prevailing economic regime. Consequently, policy recommendations derived from normal economic conditions cannot necessarily be generalized to periods of systemic crisis.

The findings make three contributions to the international literature on Islamic finance and macro-financial transmission. First, the study provides empirical evidence that macroeconomic transmission mechanisms are regime dependent, changing substantially following a major systemic shock. Second, the study identifies

exchange-rate stability as the dominant macroeconomic transmission channel affecting the Indonesian Islamic capital market during the COVID-19 period, whereas internal market dynamics dominate under normal economic conditions. Third, the proposed SMT-Sharia Model extends existing Islamic finance literature by integrating the real sector, monetary policy, exchange-rate dynamics, and Islamic equity markets within a unified structural framework. This perspective advances the understanding of Islamic capital market resilience beyond conventional correlation-based approaches by emphasizing how macroeconomic transmission mechanisms evolve across different economic regimes.

Discussion

The present study investigates how the relationships between macroeconomic fundamentals and the Indonesian Islamic capital market evolved before and during the COVID-19 pandemic. By estimating separate Structural VAR models across two economic regimes, the analysis reveals that the pandemic fundamentally altered the transmission mechanism linking the real economy, monetary policy, exchange-rate dynamics, and Islamic equity prices. These findings provide new empirical evidence that macroeconomic transmission within Islamic capital markets is inherently regime dependent rather than structurally constant.

1. Structural Transformation of Macroeconomic Transmission

One of the most important findings of this study is the substantial shift in the determinants of ISSI volatility following the outbreak of COVID-19. Prior to the pandemic, the Indonesian Islamic stock market was primarily driven by its own internal innovations, with more than 91% of forecast error variance explained by endogenous market shocks even after ten forecasting periods.

During the pandemic, however, this structure changed dramatically. Exchange-rate shocks became the largest contributor to ISSI volatility (27.24%), followed by the BI policy rate (21.13%) and GDP (17.97%), indicating that macroeconomic variables collectively dominated the behaviour of the Islamic capital market. From a macroeconomic perspective, these findings indicate that the pandemic should not merely be interpreted as a temporary financial disturbance but rather as a structural shock that simultaneously affected production, consumption, international trade, capital flows, monetary policy, and investor expectations. Under such conditions, financial markets become increasingly sensitive to macroeconomic information because uncertainty regarding future economic conditions dominates firm-specific information.

This interpretation is consistent with the uncertainty transmission framework proposed by Baker et al. (2020), who argue that COVID-19 generated one of the largest increases in global economic uncertainty in modern history. Rather than responding exclusively to corporate fundamentals, investors increasingly priced macroeconomic risk into financial assets.

2. Why Did Exchange Rate Become the Dominant Transmission Channel?

Perhaps the most striking empirical finding is the emergence of the exchange rate as the dominant macroeconomic determinant of Islamic stock market volatility during the pandemic. Several economic mechanisms explain this phenomenon. First, exchange rates immediately reflect changes in international capital movements. During periods of global uncertainty, investors rapidly reallocate portfolios toward safe-haven assets, causing substantial depreciation pressures in emerging economies. Consequently, exchange-rate movements become one of the earliest indicators of changing macroeconomic expectations. Second, depreciation directly affects the expected profitability of firms through imported input costs, foreign debt servicing, export competitiveness, and inflationary pressures. Because ISSI contains firms operating across multiple industries, exchange-rate volatility rapidly propagates into aggregate stock valuations. Third, exchange-rate movements influence investor confidence regarding macroeconomic stability. Persistent currency depreciation may signal deteriorating external balances, increasing inflationary expectations, and declining foreign investor confidence, all of which negatively affect equity market performance.

These findings are consistent with previous international evidence showing that exchange-rate risk becomes substantially more important during periods of financial crisis than under normal economic conditions (Naifar, 2016; Yarovaya et al., 2021). However, unlike previous studies relying primarily on conventional VAR models, the present research explicitly identifies the structural transmission mechanism responsible for this shift.

3. The Changing Role of Monetary Policy

The empirical findings also reveal a significant transformation in the role of monetary policy. Before the pandemic, changes in the BI policy rate exerted only modest influence on ISSI, reflecting relatively stable macroeconomic conditions in which investor decisions were primarily driven by market-specific information. During the pandemic, however, monetary policy became substantially more influential as Bank Indonesia

implemented unprecedented accommodative measures designed to stabilize liquidity, support financial markets, and sustain economic activity. Under these circumstances, policy announcements themselves became important sources of information influencing investor expectations.

This finding supports modern monetary transmission theory, which emphasizes that policy credibility and forward guidance become increasingly important during periods of systemic crisis. Rather than affecting markets solely through interest-rate changes, central banks also influence expectations regarding future economic recovery. Accordingly, the results demonstrate that monetary policy performs both a conventional stabilization function and an expectations-management function during extraordinary economic disruptions.

Another important contribution concerns the distinction between long-run equilibrium and short-run market behaviour. The VECM estimates indicate that GDP, the BI policy rate, and the exchange rate maintain statistically significant long-run relationships with ISSI, whereas short-run dynamics remain comparatively weak during the pre-pandemic period. This distinction is economically meaningful. Macroeconomic variables generally evolve gradually because production, investment, and consumption require time to adjust. Financial markets, in contrast, respond almost instantaneously to changing expectations. Consequently, temporary deviations between financial prices and macroeconomic fundamentals naturally arise before long-run equilibrium is restored.

The insignificant Error Correction Term observed before the pandemic further suggests that market participants did not immediately react to temporary disequilibria. Instead, investors gradually incorporated macroeconomic information into asset prices, allowing market expectations to converge toward equilibrium over several periods.

4. Theoretical Contribution: The SMT-Sharia Model

Perhaps the most important contribution of this study is the development of the Structural Macroeconomic Transmission for Islamic Capital Market Stability (SMT-Sharia Model). The model synthesizes the empirical evidence by conceptualizing the Islamic capital market as part of an interconnected macro-financial system rather than an isolated investment platform. The dissertation identifies this model as a central novelty arising from the comparative analysis across the two economic regimes. The SMT-Sharia Model proposes that four structural components jointly determine Islamic capital market stability: GDP, representing real-sector economic performance and long-term corporate fundamentals; BI policy rate, representing monetary policy transmission and liquidity conditions; exchange rate, representing external-sector stability and international capital flows; Islamic capital market, representing investor expectations and financial intermediation.

The empirical results further demonstrate that the relative importance of these components changes across economic regimes. Under normal conditions, the Islamic capital market is largely self-regulating through internal market dynamics. During systemic crises, however, exchange-rate stability, monetary policy, and macroeconomic recovery become the dominant determinants of market behaviour.

Accordingly, the SMT-Sharia Model extends existing Islamic finance theory by incorporating dynamic regime dependence into macroeconomic transmission. Rather than assuming constant relationships across time, the model recognizes that structural shocks fundamentally reshape the interaction between the real economy and Islamic financial market.

Conclusion

This study examines the dynamic relationships among gross domestic product (GDP), the Bank Indonesia policy rate (BI Rate), the exchange rate, and the Indonesian Sharia Stock Index (ISSI) before and during the COVID-19 pandemic using a Structural Vector Autoregression (SVAR) framework. Unlike previous studies that estimate a single macro-financial relationship across the entire sample period, this research explicitly compares two distinct economic regimes to identify whether the pandemic fundamentally altered macroeconomic transmission mechanisms affecting the Islamic capital market.

The empirical findings demonstrate that the Indonesian Islamic capital market exhibits a pronounced structural transformation following the outbreak of COVID-19. Before the pandemic, ISSI movements were primarily explained by endogenous market dynamics, with internal market innovations accounting for approximately 91% of forecast error variance after ten forecasting periods. Macroeconomic variables played only a secondary role in explaining market fluctuations, indicating that investor behaviour during stable economic conditions was driven predominantly by market-specific information and firm-level fundamentals.

The pandemic substantially altered this transmission mechanism. Exchange-rate shocks emerged as the dominant external determinant of Islamic stock market volatility, followed by the BI policy rate and GDP, demonstrating that macroeconomic variables became the principal drivers of market behaviour during periods of systemic uncertainty. This evidence confirms that the COVID-19 pandemic should be interpreted as a structural macroeconomic shock rather than merely a temporary financial disturbance because it fundamentally changed the interaction between macroeconomic fundamentals and Islamic financial markets.

The dynamic analyses further indicate that macroeconomic transmission operates differently across economic regimes. Under normal conditions, the Islamic capital market possesses relatively strong internal resilience, gradually absorbing macroeconomic disturbances through delayed adjustment processes. During systemic crises, however, investor expectations become increasingly dependent upon exchange-rate stability, monetary policy responses, and expectations regarding economic recovery. Consequently, the sensitivity of Islamic equity markets to macroeconomic conditions increases substantially during periods of extraordinary uncertainty.

Perhaps the most important contribution of this study is the development of the Structural Macroeconomic Transmission for Islamic Capital Market Stability (SMT-Sharia Model). Rather than treating macroeconomic variables and Islamic equity markets as independent components, the proposed framework conceptualizes them as an integrated macro-financial transmission system whose structure evolves across different economic regimes. This perspective extends existing Islamic finance literature by introducing regime-dependent macroeconomic transmission as a central determinant of Islamic capital market stability.

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