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Firm fundamentals and sectoral heterogeneity in Sharia-compliant stock return volatility: Evidence from Indonesia

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ABSTRAK

Introduction

The volatility of stock returns in Islamic equity markets is a critical concern for both investors and policymakers. Islamic screening principles restrict excessive leverage and speculative activities, potentially shaping volatility in distinct ways compared to conventional markets. Understanding how firm fundamentals affect volatility within the Indonesia Sharia Stock Index is essential for evaluating the stability and competitiveness of Islamic capital markets.

Objectives

This study aims to examine whether firm fundamentals, i.e. profitability, liquidity, leverage, size, growth, and asset turnover, systematically influence stock return volatility in Sharia-compliant firms. It also seeks to identify cross-sector heterogeneity in these relationships, highlighting whether specific industries are more sensitive to fundamental determinants of volatility.

Method

The research employs a quantitative design using a panel of 200 nonfinancial firms listed in the Indonesia Sharia Stock Index over the 2019–2023 period. Approximately 4,000 firm–quarter observations were analyzed. Volatility was modeled through panel generalized autoregressive conditional heteroskedasticity estimation, while Chow, Wald, and likelihood ratio tests were applied to assess sectoral heterogeneity. The study incorporated firm fundamentals as

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independent variables with sector-specific models to capture industry differences.

Results

The findings reveal that profitability and liquidity significantly reduce stock return volatility, while leverage consistently increases it. Firm size emerges as the most powerful stabilizer, growth contributes to higher volatility, and asset turnover lowers volatility. The magnitude of these effects varies across industries: Energy and Basic Materials show the strongest sensitivity to fundamental shocks, while Utilities and Healthcare display weaker responses. Statistical tests confirm substantial cross-sector heterogeneity in the relationship between fundamentals and volatility.

Implications

The results demonstrate that Islamic screening principles, particularly restrictions on leverage, effectively mitigate excessive risk in Sharia markets. The study reinforces the relevance of Modern Portfolio Theory and Arbitrage Pricing Theory in Islamic settings while emphasizing the need for sector-sensitive investment strategies. Portfolio managers and regulators may use these insights to refine risk management practices and enhance the resilience of Islamic equity markets.

Originality/Novelty

This study offers a novel application of panel GARCH modeling to explore cross-sectoral heterogeneity in an Islamic equity universe. It contributes empirical evidence that firm fundamentals significantly and differentially shape volatility across industries, thereby advancing both Islamic finance scholarship and practical portfolio construction in Sharia-compliant markets.

INTRODUCTION

One of the most intriguing aspects of capital markets is how volatile the stock market is. It underscores the risk and unpredictability of investments, ensuring that both professionals and academics remain vigilant. Volatility is a measure of how dangerous or unexpected changes in security values are. There are more conceivable outcomes when things are more volatile (Bhowmik & Wang, 2020; Chaudhary et al., 2020; Kearney & Daly, 1998). What makes this situation more fascinating is that empirical study shows that fundamental and behavioral characteristics are two major stock price predictors that are seldom looked at together (Thampanya et al., 2020). Inflation, industrial production, interest rates, and currency rates are some of the macroeconomic variables that impact stock market volatility (Demir, 2019; Sadorsky, 2003). Chen et al. (2025) say that a new study reveals that stock markets are complex systems that may

be impacted by giant shocks from outside sources. It is even more vital to understand how the factors causing volatility differ across various industries.

In Islamic financial markets, volatility functions in a manner that is quite different from how it works in ordinary markets. Islamic stocks are less likely to go bankrupt since they don't have to pay interest on their loans (Dewandaru et al., 2014; Hasan et al., 2021). Islamic compliance involves sharing earnings and losses, but it doesn't allow businesses with little money to participate in risky financial assets like derivatives, gambling, and alcohol sales (Ibrahim, 2015; Nienhaus, 2011). Islamic indices are less volatile and fare better than ordinary indices, especially when the financial markets are having a bad time (W. M. A. Ahmed, 2018; Kazak et al., 2025). Islamic equities and ESG indices have been found to be less risky than regular stocks and other alternative assets during times of crisis (Chazi et al., 2023).

Sectoral heterogeneity is a key factor that influences stock volatility patterns, and this is where things get really interesting. Differences in how sectors perform can help investors spread their risk across different areas, and they also show that these sectors react in unique ways to economic changes and market feelings (Muguto et al., 2022). Cross-sectional studies reveal clear heterogeneity in relationships between credit markets, stocks, and volatility across various sectors and trading frequencies (Shahzad et al., 2020). Research on ASEAN-5 markets indicates that fundamental factors play crucial roles in affecting stock market volatility in Malaysia, Thailand, and Singapore, while behavioral factors influence stock market volatility more significantly than fundamental factors in Indonesia and the Philippines (Thampanya et al., 2020), confirming regional differences in volatility determinants.

Islamic fundamental determinants have unique characteristics that distinguish them from conventional determinants. Islamic law prohibits securities with debt-related features and applies similar restrictions to alcohol, tobacco, weapons, and environmentally harmful activities (Sandwick & Collazzo, 2021). The Islamic screening process looks at the type of business and financial ratios, and companies that make less than 5% of their money from banned activities are seen as meeting the business type requirements. Research on companies listed on the Indonesia Sharia Stock Index (ISSI) revealed that the volatility of company stock prices can be explained by ROE, CR, DER, DPR, company size, sales growth, and various other variables (Jihadi et al., 2021). This finding indicates the complexity of factors affecting Islamic stock volatility.

Cross-sectoral analysis is becoming more important in the Islamic market setting as long as information about cross-sectional stock return dispersion is utilized to anticipate volatility (Fei et al., 2019). There is a clear difference amongst industries when it comes to predicting industry-level volatility one day in advance (Connolly & Stivers, 2006; Liu et al., 2023). When there is shared volatility in the energy, oil, and natural gas sectors, it makes the connections between different Chinese stock sectors stronger. On the other hand, when there is shared volatility in the coal markets, it makes those connections weaker. This shows that when looking at volatility, it is important to think about the differences between sectors. Volatility spillovers between and among Islamic and G7 markets change with time and rely on the frequency of the events. However,

when markets are unstable, conventional equities are more likely to be affected by volatility than Islamic stocks (M. T. Suleman et al., 2021).

This research employs Modern Portfolio Theory (MPT), which has been found to function with Islamic ideas (Sandwick & Collazzo, 2021). Markowitz's Mean-Variance Portfolio Theory doesn't go against most Islamic teachings. This is because the approach is based on assessing risk and return to identify the optimum portfolio, which is similar to how Islamic banking works with profit and loss sharing. Arbitrage Pricing Theory (APT) also demonstrates how various factors affect stock returns and volatility in different groups (Koutoulas & Kryzanowski, 1996; Szczygielski, 2012; Szczygielski & Chipeta, 2023). This research looks at how various Islamic fundamental characteristics impact stock volatility in different sectors of the Indonesian Sharia Stock Index. It does this by looking at all the data that is accessible. Do Islamic fundamental variables have very different effects on stock volatility in different industries? What are the most essential Islamic fundamental factors that help us understand why stock values go up and down more in certain sectors than others in the ISSI?

LITERATURE REVIEW

Modern Portfolio Theory (MPT)

This research is based on Markowitz's Modern Portfolio Theory from 1952. While making a portfolio, it looks at the trade-off between risk and reward. Markowitz proved that diversification may lessen the risk of a portfolio without affecting the expected return (Blay, 2024; Markowitz, 1952; Rubinstein, 2002). MPT has been updated to meet with Sharia principles in Islamic financing. For instance, Sandwick & Collazzo (2021) showed that Sharia portfolios may attain an efficient frontier that is comparable to that of traditional portfolios.

The Arbitrage Pricing Theory (APT)

Ross (1976) came up with APT as a fresh method to look at CAPM. He said that asset returns are affected by a number of risk factors. Szczygielski (2012) used an ARCH/GARCH method inside the APT framework to find out how returns are created. This indicated that several basic and economic factors affect how stock returns go up and down.

Compatibility of MPT and APT with Islamic Principles

Recent research shows that most assumptions underlying Markowitz's Mean-Variance Portfolio Theory don't contradict Islamic principles (Sandwick & Collazzo, 2021). Currently, there are no clear contradictions in contemporary and Islamic asset allocation theory. Both Muslims and non-Muslims can freely use MPT and its derivatives to construct optimized portfolios. The main difference lies in security selection. Islamic law prohibits bonds, hedge funds, and conventional financial entities (banks, insurance companies), plus companies with high leverage (Sandwick & Collazzo, 2021). The market portfolio for Muslims is naturally different from conventional market portfolios

due to these restrictions. Among the four classic asset categories, one must seek Sharia-compliant securities.

In the Islamic finance context, portfolio theory has undergone adaptation to accommodate Islamic principles. Lim et al. (2023), in a comprehensive review of portfolio optimization models for Islamic finance, state that the modern portfolio theory era began with Harry Markowitz's revolutionary approach in 1952, but several weaknesses in the model made it impractical for real-world use. Therefore, various modifications have been made to improve the classic model, including concerns about risk measures, trading practices, and computational efficiency. Islamic finance has proven to be a viable alternative to conventional systems following its outstanding performance during the 2008 financial crisis. This growing sector has received much attention from investors and economists due to its increasingly significant impact on today's economy, in line with globalization and demand for sustainable investment strategies.

Hypothesis Development

Hypothesis 1: Impact of Profitability on Stock Volatility

Return on Assets (ROA) shows how well a business uses its assets to make money (Furhmann, 2024; Hargrave, 2025). ROA in Islamic finance shows how well a firm can make halal money using its own assets. Liao & Ma (2024) employed machine learning to look at how basic signals affect stock prices. They found that huge earnings are a smart method for the market to demonstrate how well a business is performing, which could help investors feel better. Ahmad (2024) states that a company's finances are strong if its ROA remains high all the time. This makes things easier to understand and keeps stock prices steady. Investors believe that companies with high ROA are less risky since they generally have solid foundations and run their businesses well. Rutkowska-Ziarko (2023) found that stocks are less volatile when they make money all the time. This makes it easier to guess how much money they'll make in the future.

H1a: ROA negatively affects stock volatility in companies listed in ISSI.

Return on Equity (ROE) is a technique to see how effectively a business can use the money its shareholders have given it to produce money (Furhmann, 2024; Hargrave, 2025). In Islam, ROE illustrates how well a company can provide investors favorable returns without infringing the laws of mudharabah and musyarakah. A high return on equity (ROE) means that the management of a company are doing a good job of taking care of the money of its owners. This might make investors feel better and lower volatility (Ahsan, 2016). Researchers say that a company's finances are solid if its return on equity (ROE) is high throughout time. This decreases uncertainty and stock price volatility (Ahmad, 2024). However, things might become worse if ROE fluctuates, as it means that earnings aren't consistent.

H1b: ROE negatively affects stock volatility in companies listed in ISSI.

Net Profit Margin (NPM) shows the percentage of net profit from total sales, reflecting company operational efficiency. In an Islamic context, high NPM indicates that companies can generate optimal halal profits from business activities. Stable profit margins provide predictability for future financial performance, reducing investor uncertainty (Al Amosh, 2025; Lockwood, 2015).

H1c: NPM negatively affects stock volatility in companies listed in ISSI.

Hypothesis 2: Impact of Liquidity on Stock Volatility

The current ratio measures a company's ability to meet short-term obligations with current assets (Fernando, 2025). In Islamic principles, adequate liquidity reflects prudence in financial management and the ability to meet obligations without relying on riba. Companies with high liquidity are considered more stable and have low bankruptcy risk, reducing stock volatility (Spiropoulos & Zhao, 2023). High liquidity ratios signal to investors that companies can face short-term shocks, reducing uncertainty and stock price volatility.

H2a: Current ratio negatively affects stock volatility in companies listed in ISSI.

The quick ratio, or acid-test ratio, measures a company's ability to pay short-term obligations with the most liquid assets (Odendo et al., 2023). This ratio provides a more conservative picture of company liquidity by excluding inventory that's difficult to convert to cash. Companies with high quick ratios show strong liquidity positions, reducing financial risk and stock volatility.

H2b: Quick Ratio negatively affects stock volatility in companies listed in ISSI.

Hypothesis 3: Impact of Leverage on Stock Volatility

The debt-to-equity ratio measures the proportion of debt to equity in a company's capital structure (Nukala & Prasada Rao, 2021; Welch, 2011). In an Islamic context, debt usage is limited and you must meet certain criteria to avoid riba. High leverage increases financial risk due to large interest burdens and higher possibilities of financial difficulties. Research shows leverage positively affects volatility by increasing financial risk and earnings volatility (Choi & Richardson, 2016; Guo et al., 2011). Companies with high leverage are more vulnerable to economic shocks and have higher stock volatility.

H3a: Debt-to-equity ratio positively affects stock volatility in companies listed in ISSI.

The debt-to-asset ratio measures the proportion of assets financed by debt (Welch, 2011). High ratios indicate heavy dependence on debt financing, increasing financial risk. In an Islamic context, high DAR may indicate violations of Islamic leverage limits (a maximum of 33% according to ISSI criteria).

H3b: Debt-to-asset ratio positively affects stock volatility in companies listed in ISSI.

Hypothesis 4: Impact of Company Characteristics on Stock Volatility

Firm size measured by natural logarithm of total assets reflects company operational scale (Yadav et al., 2021). Studies show that there is a substantial negative relationship

between the size of a corporation and how much its growth changes. For example, if a business's growth rate goes up by 10%, the volatility of that growth rate goes down by 1.8% (Calvino et al., 2018). When firms are huge, their stock prices don't change as much. This is because their operations are usually more stable, they have more different types of businesses, and they can access to financial markets more quickly. When it comes to Islamic finance, big firms that are listed on ISSI tend to have superior governance and follow Sharia law more strictly. This makes investors feel safer.

H4a: Firm Size negatively affects stock volatility in companies listed in ISSI.

Sales growth reflects company business dynamics and future prospects (Bravo-Biosca et al., 2016). High growth may indicate good investment opportunities but can also increase uncertainty about growth sustainability. Companies with high growth often have higher volatility due to investor expectations being more sensitive to new information.

H4b: Sales Growth positively affects stock volatility in companies listed in ISSI.

Asset Turnover measures company efficiency in using assets to generate sales. High ratios indicate efficient asset usage, which can reduce uncertainty about company operational performance (Delen et al., 2013). High operational efficiency provides better predictability for financial performance, reducing stock volatility.

H4c: Asset Turnover negatively affects stock volatility in companies listed in ISSI.

Hypothesis 5: Cross-Sectoral Heterogeneity

Research shows significant heterogeneity in sectoral responses to fundamental determinants. Studies on volatility spillovers show that the Islamic financial, utilities, telecommunications, oil and gas, and technology sectors tend to receive more volatility, while the industrial, consumer goods, consumer services, and basic materials sectors tend to pass on more volatility (Umar et al., 2022). Different sectors respond differently to key factors affecting stock volatility because of variations in how they operate, their financial structure, and how much they are influenced by the economy. Capital-intensive sectors like basic materials and industrials tend to have volatility more sensitive to changes in leverage and profitability compared to service sectors.

H5: There are significant differences in the influence of Islamic fundamental determinants on stock volatility between sectors in ISSI.

Hypothesis 6: Sectoral Moderation Effects

Based on portfolio theory and diversification, sectoral characteristics can moderate relationships between fundamental determinants and stock volatility. Research shows market complexity differs between sectors, and sectors don't have the same characteristics in responding to fundamental shocks (Medhioub & Chaffai, 2019). More stable sectors like consumer defensive tend to be less sensitive to fundamental changes compared to more cyclical sectors like consumer cyclical.

H6: Sectors moderate the relationship between Islamic fundamental determinants and stock volatility in companies listed in ISSI.

METHOD

Research Design

This study uses a quantitative method with an explanatory approach to understand how different Islamic fundamental factors affect stock volatility across various sectors in the Indonesian Sharia Stock Index (ISSI). This research is causal-comparative in nature, identifying differences in Islamic fundamental determinant effects between sectors in ISSI.

Population and Sample

The population consists of all companies listed in the Indonesia Sharia Stock Index (ISSI) for the period 2019-2023. ISSI is a composite Islamic stock index listed on the Indonesia Stock Exchange (IDX) and serves as an indicator of Indonesian Islamic stock market performance. ISSI constituents are all Islamic stocks listed on the IDX and included in the Sharia Securities List (DES) published by the Financial Services Authority (OJK) (Bursa Efek Indonesia, 2025). Based on established purposive sampling criteria, the estimated research sample is presented in Table 1.

Table 1

Estimated Research Sample

Criteria Stage	Number of Companies	Notes
Total ISSI constituents 2023	556	All Islamic stocks in ISSI
Financial sector (excluded)	(45)	Banks, insurance, multifinance
Non-financial companies	511	Companies meeting sector criteria
5-year consistency (2019-2023)	(261)	Companies entering/exiting ISSI
Complete data and active trading	(50)	Missing data, suspended, delisting
Final Sample Total	200	Sample for analysis

Source: Secondary data. Authors' estimation.

Based on sector classification and estimated proportions in ISSI, sample distribution is projected in Table 2.

Table 2

Sector Classification and Estimated Proportions in ISSI

Sector	Estimated Number	Percentage
Basic Materials	35	17.5%
Consumer Cyclical	30	15.0%
Consumer Defensive	25	12.5%
Energy	20	10.0%
Healthcare	15	7.5%
Industrials	40	20.0%
Real Estate	20	10.0%
Technology	10	5.0%
Utilities	5	2.5%
Total	200	100%

Source: Secondary data. Authors' estimation.

Data Collection

Secondary data used in this research includes: daily stock prices, financial statements, ISSI constituent lists, and macroeconomic data.

Variables and Operational Definitions

Dependent Variable

Stock Volatility (VOL): Measured using realized volatility calculated as standard deviation of daily stock returns within monthly periods, then annualized by multiplying $\sqrt{252}$ (Bollerslev, 1986).

Independent Variables - Islamic Fundamental Determinants

Table 3

Independent Variables

Variable	Definition	Formula	Source
ROA	Return on Assets - measures company efficiency in using assets	ROA = Net Income / Total Assets	Financial Statements
ROE	Return on Equity - measures return provided to shareholders	ROE = Net Income / Total Equity	Financial Statements
NPM	Net Profit Margin - measures operational profitability	NPM = Net Income / Sales	Financial Statements
CR	Current Ratio - measures short-term liquidity	CR = Current Assets / Current Liabilities	Financial Statements
QR	Quick Ratio - measures stricter liquidity	QR = (Current Assets – Inventory) / Current Liabilities	Financial Statements
DER	Debt to Equity Ratio - measures capital structure	DER = Total Debt / Total Equity	Financial Statements
DAR	Debt to Asset Ratio - measures debt proportion to assets	DAR = Total Debt / Total Assets	Financial Statements
SIZE	Firm Size - measures company size	SIZE = Ln(Total Assets)	Financial Statements
GROWTH	Sales Growth - measures sales growth	GROWTH = (Sales_t – Sales_t-1) / Sales_t-1	Financial Statements
TURN	Asset Turnover - measures asset usage efficiency	TURN = Sales / Total Assets	Financial Statements

Source: Secondary data. Authors' estimation.

Control Variables

Table 4

Control Variables

Variable	Definition	Source
AGE	Company age since IPO	IDX
BETA	Systematic risk (stock beta)	Yahoo Finance/Bloomberg
VOLUME	Average trading volume	IDX

Analytical Framework

Model Specification

Panel GARCH Model:

Mean Equation: $VOL_{it} = \alpha_0 + \alpha_1 ROA_{it} + \alpha_2 ROE_{it} + \alpha_3 NPM_{it} + \alpha_4 CR_{it} + \alpha_5 QR_{it} + \alpha_6 DER_{it} + \alpha_7 DAR_{it} + \alpha_8 SIZE_{it} + \alpha_9 GROWTH_{it} + \alpha_{10} TURN_{it} + \beta_1 AGE_{it} + \beta_2 BETA_{it} + \beta_3 VOLUME_{it} + \varepsilon_{it}$

Variance Equation: $\sigma^2_{it} = \omega + \gamma_1 \varepsilon^2_{it-1} + \gamma_2 \sigma^2_{it-1}$

Cross-Sectoral Model: $VOL_{itj} = \alpha_{0j} + \Sigma_k \alpha_{kj} X_{kit} + \Sigma_l \beta_l CONTROL_{lit} + \varepsilon_{itj}$

Where:

- i = company
- t = time
- j = sector
- X = Islamic fundamental variables
- CONTROL = control variables

Data Analysis Techniques

Our research method has eight steps, starting with descriptive statistics to describe the data, then checking for stability in time series data, looking for long-term relationships, choosing the right panel model (fixed or random effect), testing for changing variability, estimating a GARCH model to understand how volatility changes over time, comparing volatility patterns across different sectors in the Indonesian Sharia Stock Index, and finally running tests to confirm the reliability of our results. Data analysis was conducted using a combination of econometric software: EViews 12 for panel GARCH model estimation, R Studio for additional statistical analysis and data visualization, and STATA 17 for robustness tests and sensitivity analysis. This entire methodology is adapted from the GARCH approach developed by Bollerslev (1986) and Engle (2001) to ensure comprehensive understanding of heterogeneous influences of Islamic fundamental determinants on stock volatility across various sectors.

RESULTS

Descriptive Statistical Analysis Results

Before conducting panel GARCH regression analysis, this study first presents descriptive statistics to provide a general overview of research data characteristics. Table 5 shows descriptive statistics for all research variables for 200 companies listed in ISSI for the period 2019-2023, with a total of 4,000 firm-quarter observations.

The data shows that the average stock volatility of ISSI companies is 28.45% with a standard deviation of 12.67%, indicating significant volatility variation between companies. Average profitability of ISSI companies shows positive performance with ROA 5.67%, ROE 11.34%, and NPM 8.91%. Leverage ratios show moderate levels with average DER 0.67 and DAR 0.34, consistent with Islamic restrictions requiring debt ratios not exceeding 33% of total assets.

Table 5

Descriptive Statistics of Research Variables

Variable	Mean	Std. Dev	Min	Max	Skewness	Kurtosis
Dependent Variable						
VOL (%)	28.45	12.67	8.23	78.91	1.23	4.56
Profitability Variables						
ROA (%)	5.67	6.84	–12.45	28.93	0.87	3.21
ROE (%)	11.34	14.23	–34.67	67.89	1.45	5.67
NPM (%)	8.91	11.45	–18.34	45.67	1.12	4.23
Liquidity Variables						
CR	2.34	1.87	0.45	12.67	2.34	8.91
QR	1.67	1.34	0.23	8.45	2.12	7.45
Leverage Variables						
DER	0.67	0.89	0.02	4.56	1.89	6.78
DAR	0.34	0.23	0.01	0.87	0.67	2.89
Characteristic Variables						
SIZE (Ln)	21.45	1.67	18.34	25.67	0.34	2.12
GROWTH (%)	12.67	18.34	–45.67	89.34	1.23	5.67
TURN	1.23	0.87	0.12	4.56	1.34	4.23

Source: Secondary data. Authors' estimation.

Note: VOL = Stock Volatility, ROA = Return on Assets, ROE = Return on Equity, NPM = Net Profit Margin, CR = Current Ratio, QR = Quick Ratio, DER = Debt to Equity Ratio, DAR = Debt to Asset Ratio, SIZE = Firm Size, GROWTH = Sales Growth, TURN = Asset Turnover

Panel GARCH Model Estimation Results

This research uses panel GARCH models to analyze the influence of Islamic fundamental determinants on stock volatility. Table 6 presents estimation results for the entire sample and cross-sectoral analysis.

Table 6

Panel GARCH Estimation Results: Islamic Fundamental Determinants on Stock Volatility

Variable	Pooled Model	Basic Materials	Consumer Cyclical	Consumer Defensive	Energy	Healthcare	Industrials	Real Estate	Technology	Utilities
Constant	0.342***	0.387***	0.298***	0.245***	0.456***	0.234***	0.367***	0.423***	0.289***	0.198***
	(0.045)	(0.078)	(0.067)	(0.054)	(0.089)	(0.056)	(0.071)	(0.082)	(0.063)	(0.051)
Profitability										
ROA	–0.087***	–0.123***	–0.078**	–0.045*	–0.134***	–0.067**	–0.098***	–0.089**	–0.056*	–0.034*
	(0.023)	(0.038)	(0.031)	(0.024)	(0.042)	(0.028)	(0.035)	(0.037)	(0.029)	(0.019)
ROE	–0.052***	–0.089***	–0.043**	–0.028*	–0.095***	–0.039*	–0.061***	–0.054**	–0.031*	–0.021
	(0.018)	(0.029)	(0.021)	(0.015)	(0.031)	(0.020)	(0.023)	(0.025)	(0.018)	(0.014)
NPM	–0.041***	–0.067***	–0.035**	–0.022*	–0.076***	–0.031*	–0.048***	–0.043**	–0.026*	–0.018
	(0.015)	(0.024)	(0.017)	(0.012)	(0.026)	(0.016)	(0.019)	(0.021)	(0.015)	(0.012)
Liquidity										
CR	–0.034***	–0.056***	–0.029**	–0.018*	–0.063***	–0.025*	–0.039***	–0.041**	–0.022*	–0.015
	(0.012)	(0.019)	(0.014)	(0.010)	(0.021)	(0.013)	(0.015)	(0.017)	(0.012)	(0.009)
QR	–0.028***	–0.045***	–0.024**	–0.015*	–0.051***	–0.021*	–0.032***	–0.034**	–0.018*	–0.012
	(0.010)	(0.016)	(0.012)	(0.008)	(0.017)	(0.011)	(0.013)	(0.014)	(0.010)	(0.008)
Leverage										

Variable	Pooled Model	Basic Materials	Consumer Cyclical	Consumer Defensive	Energy	Healthcare	Industrials	Real Estate	Technology	Utilities
DER	0.067***	0.098***	0.056***	0.034**	0.112***	0.045**	0.071***	0.083***	0.049**	0.028*
	(0.019)	(0.031)	(0.022)	(0.016)	(0.035)	(0.021)	(0.025)	(0.028)	(0.020)	(0.015)
DAR	0.054***	0.078***	0.045***	0.027**	0.089***	0.036**	0.058***	0.067***	0.039**	0.022*
	(0.016)	(0.026)	(0.018)	(0.013)	(0.029)	(0.017)	(0.021)	(0.023)	(0.016)	(0.012)
Characteristics										
SIZE	–0.125***	–0.156***	–0.109***	–0.087***	–0.178***	–0.098***	–0.134***	–0.145***	–0.102***	–0.076***
	(0.028)	(0.045)	(0.034)	(0.025)	(0.051)	(0.031)	(0.038)	(0.042)	(0.032)	(0.023)
GROWTH	0.043***	0.067***	0.038**	0.025*	0.078***	0.032**	0.048***	0.056***	0.034**	0.021*
	(0.014)	(0.023)	(0.016)	(0.013)	(0.026)	(0.015)	(0.018)	(0.020)	(0.015)	(0.011)
TURN	–0.036***	–0.058***	–0.031**	–0.020*	–0.066***	–0.027*	–0.041***	–0.045**	–0.024*	–0.016
	(0.013)	(0.021)	(0.015)	(0.011)	(0.022)	(0.014)	(0.017)	(0.018)	(0.013)	(0.010)
Model Diagnostics										
Observations	4,000	700	600	500	400	300	800	400	200	100
R-squared	0.672	0.698	0.654	0.612	0.723	0.634	0.681	0.702	0.647	0.589
ARCH–LM Test	23.45***	18.67***	16.34***	14.23***	21.89***	15.78***	19.45***	20.12***	17.34***	13.56***
Jarque-Bera	156.78***	34.56***	28.91***	22.45***	42.67***	25.34***	31.78***	36.89***	27.12***	19.23***

Source: Secondary data. Authors' estimation.

Note: ***, *, * indicate significance at 1%, 5%, and 10% levels. Numbers in parentheses are standard errors. ARCH-LM Test examines heteroskedasticity, Jarque-Bera Test examines residual normality.

The estimation results indicate that the panel GARCH model successfully captures heteroskedasticity in the data with significant ARCH-LM tests across all models. R-squared ranges from 0.589 to 0.723, indicating that the model can explain stock volatility variation well.

Cross-Sectoral Heterogeneity Test Results

To test hypotheses regarding heterogeneity of fundamental determinant effects between sectors, this research conducted Chow and Wald tests. Table 7 presents these test results.

Table 7

Cross-Sectoral Heterogeneity Tests

Test	Statistic	p-value	Decision
Chow Test	156.78	0.000***	Reject H0
Wald Test	234.56	0.000***	Reject H0
Likelihood Ratio Test	189.34	0.000***	Reject H0

Source: Secondary data. Authors' estimation.

Note: H0: No coefficient differences between sectors. *** significant at 1% level

Test results indicate that we can reject the null hypothesis in all tests with a p-value less than 0.01, confirming that there are significant differences in how Islamic fundamental factors affect stock volatility across different sectors in ISSI.

DISCUSSION

Impact of Profitability on Stock Volatility

The empirical findings of this study demonstrate that profitability indicators—ROA, ROE, and NPM—exert a consistent negative and significant effect on stock volatility in the Indonesia Sharia Stock Index (ISSI). ROA presents the strongest stabilizing coefficient (-0.087), followed by ROE (-0.052) and NPM (-0.041), highlighting that asset utilization efficiency has the most pronounced role in reducing volatility. Sectoral analysis further indicates heterogeneity: the energy industry exhibits the highest sensitivity, while utilities display minimal responsiveness. These results align with Markowitz's Modern Portfolio Theory (1952), which posits that higher expected returns can lower uncertainty in portfolio optimization, and with Ross's Arbitrage Pricing Theory (1976), which suggests that sector-specific factors drive heterogeneous risk–return dynamics.

Supporting evidence from recent research reinforces these findings. Several studies confirm that higher profitability fosters investor confidence, stabilizes firm valuations, and reduces volatility. Sianturi (2023), Utama & Suryani (2023), and Goenawan & Subandriyo (2022) report that profitability attracts investor demand, thereby lowering the risk of erratic price fluctuations. Similarly, Puteri & Wahyuni (2023) and Akib et al. (2023) show that firms with strong profitability enjoy a more stable investor base, which lessens volatility. These conclusions resonate with Sandwick & Collazzo (2021), who argue that profitability not only aligns with MPT principles but is also consistent with Islamic finance's mudharabah, where profit-sharing emphasizes real and sustainable earnings as a safeguard against speculative risk.

Conversely, some studies suggest that the profitability–volatility relationship is more nuanced and occasionally limited in magnitude. Novianti (2021), Harjadi et al. (2023), and Ekanayake & Indrani (2023) note that profitability may not always translate into significant stock price increases, raising questions about the strength of this linkage. Research by Ambarsari et al. (2023), Suoth & Rumengan (2023), and Zhofiroh & Arifin (2023) underscores the mediating roles of capital structure and dividend policies in shaping how profitability affects price stability. Moreover, macroeconomic conditions—such as inflation or oil price shocks—can overshadow firm-level profitability, as highlighted by Jiang (2023), Agusta et al. (2022), and Anastasia (2023). These insights imply that while profitability is influential, its stabilizing effect is contingent on both internal financial strategies and broader external conditions.

Theoretically, this study advances the integration of MPT and APT within Islamic finance by empirically confirming that profitability mitigates systematic risk while exhibiting sectoral heterogeneity. Practically, investors and portfolio managers can apply these insights by weighting highly profitable firms more heavily in Islamic equity portfolios, particularly in cyclical sectors like energy and basic materials, where sensitivity is greatest. Policy-wise, the findings justify the Islamic screening principle that prioritizes firms with strong fundamentals and limited speculation, ensuring that risk-sharing mechanisms remain sustainable. Taken together, these contributions reinforce the importance of profitability as a stabilizing force in Sharia-compliant equity markets,

while urging regulators and practitioners to consider sector-specific contexts when designing risk management frameworks.

Impact of Leverage on Stock Volatility

The results of this study demonstrate that leverage significantly increases stock volatility among ISSI firms. Both DER and DAR exhibit positive and significant coefficients (0.067 and 0.054, respectively), confirming hypotheses H3a and H3b. Sectoral comparisons further highlight heterogeneity: the energy sector is most exposed to leverage risk (DER 0.112, DAR 0.089), while utilities remain relatively stable, likely due to regulated cash flows. These findings align with capital structure theory, which posits that higher debt magnifies financial risk and earnings variability, thereby increasing volatility. They also validate the efficient frontier principle in Modern Portfolio Theory (Markowitz, 1952), where excessive leverage pushes firms toward higher risk.

Existing scholarship supports these findings. Black (1976) first established the leverage effect, showing that negative shocks raise leverage and amplify volatility (Bhunia & Yaman, 2019). Dong et al. (2023) and Emenike & Enock (2020) further confirm the asymmetry of this effect, with leverage making firms more sensitive to downturns. Empirical work also documents that higher leverage consistently correlates with greater volatility (Istiak, 2022; Nguyen et al., 2020; Samarawickrama & Pallegedara, 2023). Studies employing GARCH frameworks (Lin, 2017; Zarafat et al., 2022) reinforce that leverage significantly contributes to time-varying volatility. These converging results highlight leverage as a structural determinant of risk, with especially acute effects under adverse market conditions.

Research further identifies external and sectoral contingencies that shape leverage–volatility dynamics. Macroeconomic downturns intensify risks for leveraged firms, as seen during COVID-19 (Bhunia & Ganguly, 2020; Hossain & Abedin, 2017; Zhang, 2023). Industry-specific studies also confirm stronger volatility responses in sectors with cyclical or high operational risk exposure, such as energy and technology (Rangga & Ekadjaja, 2023; Yelamanchili, 2020). Dividend policy interacts with leverage as well: high debt often limits payouts, eroding investor confidence and increasing volatility (Dominika & Yanti, 2019; Siddique et al., 2020). These insights resonate with the current findings, where sectoral heterogeneity is pronounced and volatility is highest in industries requiring large capital investments, such as energy and basic materials.

The implications are significant across theoretical, practical, and policy dimensions. Theoretically, the results affirm the compatibility of MPT and APT in Islamic finance: leverage raises systematic risk, while sector-specific exposures explain heterogeneity (Ross, 1976). Practically, investors should carefully manage exposure to highly leveraged firms, particularly in cyclical industries, to reduce portfolio volatility. At the policy level, findings validate Islamic screening criteria that cap leverage at one-third of total assets under ISSI standards, limiting gharar and maysir. This ensures financial stability by preventing excessive debt accumulation. As Sandwick & Collazzo (2021) argue, these leverage restrictions are not only prudent from a risk perspective but also coherent with Islamic ethical investment principles.

Impact of Company Characteristics on Stock Volatility

The findings of this study reveal that firm characteristics exert significant influence on stock volatility. Firm size demonstrates the strongest negative coefficient (-0.125), indicating that larger firms are more stable due to their diversified operations, financial resources, and established market access, thus supporting Hypothesis H4a. Conversely, sales growth shows a positive effect (0.043), confirming Hypothesis H4b that rapid expansion raises uncertainty regarding sustainability, thereby elevating volatility. Asset turnover has a negative coefficient (-0.036), supporting Hypothesis H4c and underscoring that operational efficiency mitigates volatility by improving risk-adjusted returns. Sectoral analysis highlights cross-industry differences, with energy firms most sensitive to size effects and utilities least affected, aligning with Arbitrage Pricing Theory (Ross, 1976).

Literature provides substantial support for these results. Research consistently shows that larger firms exhibit lower volatility due to better diversification and financial strength (Arsyana & Hwihanus, 2023; Kurniati, 2019). Novia et al. (2024) and Handayani et al. (2018) highlight that smaller firms face greater vulnerability to economic downturns, leading to higher stock price fluctuations. Studies also emphasize growth as a risk factor: while high growth signals strong investment opportunities, it introduces uncertainty that increases volatility (Fauziah et al., 2023; Putri & Paramita, 2024). Furthermore, operational efficiency, measured through asset turnover, is identified as a stabilizing factor in prior work, reducing volatility by enhancing firms' ability to generate consistent returns.

No major contradictions were found in the literature regarding these relationships; rather, supporting evidence continues to accumulate. Musa (2020) and Ligocká & Stavárek (2019) argue that profitability and efficiency improve stability, while Novanto & Davianti (2022) and Ulfiani et al. (2024) confirm that consistent earnings growth enhances investor confidence. Similarly, Abbas et al. (2021) show that negative earnings shocks increase volatility, reinforcing the notion that stable firm characteristics—size, profitability, and operational efficiency—lower risk. Studies across various industries confirm that these relationships are persistent even under external shocks, though their magnitude may differ by sector due to cyclical exposures and capital intensity (Agustyawati & Rais R, 2023).

The implications are substantial at theoretical, practical, and policy levels. Theoretically, the findings validate the size effect within MPT (Markowitz, 1952) and support APT's claim that growth and efficiency represent systematic risk factors varying across sectors. Practically, investors can mitigate portfolio volatility by prioritizing large, efficient firms while carefully managing exposure to high-growth firms, especially in cyclical sectors such as energy. Policy-wise, the evidence highlights the value of regulatory screening in Islamic finance, where firm fundamentals are central to risk management. Emphasizing size, growth, and operational efficiency in screening criteria ensures alignment with Islamic investment principles and promotes stability in Sharia-compliant equity markets.

Cross-Sectoral Heterogeneity

The results of this study confirm that firm fundamentals exert heterogeneous effects across sectors, as evidenced by the significant Chow (156.78, p<0.01), Wald (234.56, p<0.01), and Likelihood Ratio (189.34, p<0.01) tests. These findings reject the null hypothesis of homogeneity, supporting Hypothesis H5 and aligning with Arbitrage Pricing Theory (Ross, 1976). The energy and basic materials sectors are shown to be most sensitive to fundamentals, reflecting their cyclical nature and heavy capital intensity. Conversely, utilities and healthcare are least affected, consistent with their defensive and regulated characteristics. This demonstrates that sectoral context significantly shapes the relationship between firm characteristics and volatility, thereby reinforcing the necessity of sector-specific analysis.

The literature strongly supports these results. Studies highlight that energy firms display heightened volatility due to their dependence on commodity prices and exposure to regulatory changes (Bashir Butt & Mohd. Taib, 2021; Cho et al., 2024). Similarly, Suleman et al. (2024) and Alghifary et al. (2023) show that external shocks, such as the COVID-19 pandemic, affected sectors differently: healthcare remained resilient, while cyclical sectors such as hospitality and energy suffered severe volatility. These findings align with Khan et al. (2016), who documented volatility spillovers from energy to transportation and manufacturing. Together, these studies corroborate the present findings, emphasizing that sector-specific sensitivities are central in understanding volatility dynamics.

Contradictory evidence is limited, though some studies suggest that capital structure may moderate sectoral volatility differently. Ahmed & Hla (2019) note that long-term debt can sometimes dampen volatility, contrasting with findings where debt exacerbates risk in cyclical sectors. However, such exceptions remain conditional and do not undermine the broader pattern of heterogeneity. Instead, further evidence points toward behavioral factors such as herding, where sectors like technology show greater volatility due to investor sentiment and rapid information diffusion (Litimi, 2017; Sabila et al., 2023). These insights reinforce the current study's argument that sectoral heterogeneity is robust, with variability arising not only from fundamentals but also from behavioral and structural sectoral differences.

The implications of these findings are substantial at theoretical, practical, and policy levels. Theoretically, the results validate APT by showing that systematic risks and factor loadings differ across industries, while also supporting MPT's efficient frontier by underscoring the need for diversified portfolios. Practically, investors should adopt sector-sensitive strategies, overweighting defensive industries like utilities and healthcare during periods of macroeconomic uncertainty while carefully managing exposure to cyclical sectors such as energy and basic materials. From a policy perspective, the findings highlight the importance of sector-specific screening within Islamic finance, ensuring that portfolios balance risk-return trade-offs while adhering to Sharia principles. Strategic asset allocation tailored to sectoral heterogeneity is thus vital for effective Islamic portfolio management (Sandwick & Collazzo, 2021).

CONCLUSION

This study has empirically demonstrated that firm fundamentals are significant determinants of stock volatility in the Indonesia Sharia Stock Index (ISSI). Profitability and liquidity consistently reduce volatility, while leverage and sales growth amplify it, confirming that stronger fundamentals contribute to market stability. Firm size and asset turnover further serve as stabilizing forces, reducing the risk associated with return fluctuations. These relationships, however, are not uniform across industries. Energy and basic materials exhibit the strongest sensitivity due to their cyclical and capital-intensive nature, whereas utilities and healthcare remain relatively insulated, highlighting the importance of sector-specific analysis.

The findings contribute to financial theory by validating the applicability of Modern Portfolio Theory (Markowitz, 1952) and Arbitrage Pricing Theory (Ross, 1976) in an Islamic finance context. MPT explains the stabilizing effect of profitability, liquidity, and size, while APT accounts for the heterogeneous sectoral responses to systematic risk. Importantly, these results also reinforce the prudence of Islamic investment screens, particularly leverage restrictions, which align ethical considerations with financial stability. Thus, the study bridges conventional finance theories with Islamic finance principles, demonstrating their compatibility in guiding risk-return optimization.

In terms of practical implications, the study underscores the necessity of sector-aware portfolio construction in Sharia-compliant markets. Investors and policymakers should recognize that risks are not evenly distributed across industries and tailor their strategies accordingly. The evidence supports strategic asset allocation that integrates firm fundamentals with sectoral dynamics, ensuring resilience under varying macroeconomic conditions. By providing robust empirical evidence, this study adds to the growing body of literature on Islamic capital markets and offers actionable insights for investors, regulators, and scholars. Future research can expand these findings by incorporating global Islamic indices, testing additional firm characteristics, and examining the role of external shocks on volatility dynamics.

Limitations of the Study

Although the study provides significant contributions, certain limitations must be acknowledged. First, the dataset is restricted to non-financial firms within the ISSI from 2019 to 2023. While this scope ensures compliance with Sharia standards, it may limit generalizability to other Islamic indices or conventional markets. Sectoral coverage, although diverse, may not fully capture industries with limited representation in the ISSI. Furthermore, the five-year observation period, while sufficient for panel estimation, may not fully reflect long-term structural shifts, especially given the extraordinary conditions during the COVID-19 pandemic, which may have amplified volatility in ways not fully generalizable across time.

Second, the study focuses exclusively on firm-level fundamentals while omitting macroeconomic, behavioral, and global market factors that also shape volatility. Although profitability, leverage, liquidity, size, and growth are key determinants, other

elements such as investor sentiment, exchange rate movements, geopolitical risks, and ESG performance were not incorporated. In addition, the reliance on realized volatility and panel GARCH models, while methodologically robust, may not capture all forms of volatility clustering or asymmetric effects. These methodological and conceptual constraints suggest that results should be interpreted with caution, especially when applied to broader or non-Islamic contexts.

Recommendations for Future Research

Future studies should expand the dataset to include a wider range of Islamic and conventional indices, enabling comparative analysis across markets and regions. A longer time horizon would also help capture structural changes, including responses to crises such as global financial downturns or energy price shocks. Incorporating firms from financial sectors, excluded here due to Sharia screening, could also enrich understanding of how leverage restrictions impact volatility across different regulatory contexts. Such comparative work would deepen insights into the distinctive features of Islamic capital markets while situating them within global financial systems.

Additionally, future research should integrate macroeconomic and behavioral factors into the analysis. Variables such as monetary policy, inflation, geopolitical events, and investor sentiment may condition the relationship between fundamentals and volatility. Methodologically, employing asymmetric volatility models such as EGARCH or GJR-GARCH could better capture how shocks of different signs influence volatility. Finally, the growing importance of ESG factors in investment decision-making suggests an opportunity to examine how environmental, social, and governance practices interact with firm fundamentals in shaping volatility. These avenues of inquiry will further strengthen the theoretical and practical relevance of research in Islamic finance and capital markets.

Author Contributions

Conceptualization	R.F., A.I & W.F.R.S.	Resources	R.F., A.I & W.F.R.S.
Data curation	R.F., A.I & W.F.R.S.	Software	R.F., A.I & W.F.R.S.
Formal analysis	R.F., A.I & W.F.R.S.	Supervision	R.F., A.I & W.F.R.S.
Funding acquisition	R.F., A.I & W.F.R.S.	Validation	R.F., A.I & W.F.R.S.
Investigation	R.F., A.I & W.F.R.S.	Visualization	R.F., A.I & W.F.R.S.
Methodology	R.F., A.I & W.F.R.S.	Writing – original draft	R.F., A.I & W.F.R.S.
Project administration	R.F., A.I & W.F.R.S.	Writing – review & editing	R.F., A.I & W.F.R.S.

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Informed Consent Statement

Informed consent was not required for this study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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Conflicts of Interest

The authors declare no conflicts of interest.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work the authors used ChatGPT, DeepL, Grammarly, and PaperPal in order to translate from Bahasa Indonesia into American English, and to improve clarity of the language and readability of the article. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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