

ZAKAT AS RELIGIOSITY FACTOR WITHIN MACROECONOMIC, ESG AND ON STOCK VOLATILITY IN PT ALAMTRI RESOURCES OF THE JAKARTA ISLAMIC INDEX

Syamil Fatih Muhammad Alfaruqiy

Roikhan Mochamad Aziz

¹Universitas Islam Negeri Syarif Hidayatullah Jakarta, Indonesia

ABSTRACT

This research employs a quantitative approach using monthly time-series data. The variables include inflation, the JII Index, greenhouse gas (GHG) emissions, and national zakat collection. Ordinary Least Squares (OLS) regression was applied to examine both partial and simultaneous effects on stock volatility. The results reveal that inflation significantly affects stock volatility, while the JII Index demonstrates a positive yet insignificant influence. GHG emissions show a significant effect, indicating that environmental performance contributes to market risk perception. Zakat as a religiosity factor exhibits a significant effect on volatility. Simultaneously, all variables significantly influence volatility. This study aims to analyze the effects of zakat as a religiosity factor within macroeconomic indicators, ESG performance on the stock price volatility of PT Alamtri Resources, one of the constituents of the Jakarta Islamic Index (JII), during the period 2020–2023. The analysis focuses on a single issuer within the JII, limiting generalizability. Future studies may expand to cross-sectoral comparisons. The findings provide insight for Islamic investors and policymakers concerning the integration of sustainability and social indicators into investment risk assessment. This study integrates ESG and zakat as a religiosity variable in modeling volatility within the Islamic capital market, an approach rarely explored in existing literature.

Keywords: Zakat, ESG, JII Index, Inflation, Religiosity

I. INTRODUCTION

Volatility in stock prices remains one of the most essential indicators of risk within capital markets, including the rapidly expanding Islamic capital market ecosystem. As investors increasingly diversify their portfolios, understanding the drivers of volatility becomes crucial—particularly in markets influenced not only by macroeconomic fundamentals, but also by ethical, environmental, and socio-religious considerations such as zakat. Within Indonesia, the Jakarta Islamic Index (JII) serves as a benchmark for sharia-compliant equities, reflecting both financial performance and adherence to Islamic screening principles. One of its constituents, PT Alamtri Resources, represents a strategic energy-sector player whose stock price movements have shown noticeable fluctuations throughout the 2020–2023 period. These fluctuations raise important questions about the extent to which various economic, environmental, and social variables influence volatility within sharia-compliant equities.

Macroeconomic indicators play a central role in shaping investor expectations and market dynamics. Inflation, for instance, directly affects purchasing power and economic stability, often elevating uncertainty in the market and driving fluctuations in asset prices. Similarly, movements in the Jakarta Islamic Index (JII) act as a representation of broader market sentiment toward sharia-compliant instruments. Yet, evidence regarding how these macroeconomic variables influence

volatility in individual sharia stocks remains mixed, suggesting a gap that should be empirically verified within specific sectoral contexts (Aziz, 2019).

Beyond macroeconomic factors, issues surrounding Environmental, Social, and Governance (ESG) performance have increasingly shaped global investment behaviour. With the rise of sustainable finance frameworks and low-carbon investment indices, companies—particularly in resource-intensive sectors—face growing scrutiny regarding their environmental impact. One of the most critical indicators is greenhouse gas (GHG) emissions, which directly reflect an organization's environmental footprint. Although ESG-related studies have expanded in recent years, the integration of ESG—especially emissions data—into the analysis of volatility in Indonesia's Islamic capital market remains underexplored. This creates an important research opportunity, particularly given Indonesia's unique dual emphasis on sharia principles and sustainability commitments.

The Islamic capital market is also influenced by sociocultural dynamics, especially factors rooted in religious behaviour. Religiosity, proxied in this study through national zakat collection data, may indirectly reflect the economic engagement and ethical preferences of Muslim investors. While prior literature acknowledges the relevance of religious motivations in investment decision-making, the use of religiosity as an economic variable—particularly its relationship with volatility—remains scarce. This introduces a novel dimension for examining investor behaviour within sharia-compliant equity markets.

Despite the vast literature on financial volatility, existing research rarely integrates macroeconomic indicators, ESG factors, and religiosity into a single comprehensive model. This presents a clear research gap, especially in the context of strategic energy-sector issuers such as PT Alamtri Resources. The company's operational nature, exposure to commodity-driven risks, and availability of detailed emissions data make it a suitable object of study to understand how economic, environmental, and socio-religious factors collectively influence stock volatility in Indonesia's Islamic capital market.

Addressing these gaps, this study aims to examine the influence of inflation, JII performance, GHG emissions, and religiosity on the volatility of PT Alamtri Resources' stock price during 2020–2023. The analysis is conducted using monthly time-series data and the Ordinary Least Squares (OLS) regression method. The study also formulates the following research questions:

1. Do macroeconomic variables significantly affect the company's stock volatility?
2. How does ESG performance, particularly GHG emissions, impact volatility?
3. What is the role of religiosity in shaping volatility within a sharia-compliant stock?
4. To what extent do these variables collectively influence stock volatility?

The findings of this study are expected to enrich the academic discussion on volatility determinants in Islamic capital markets by providing empirical evidence that integrates sustainability-oriented factors and socio-religious perspectives. Furthermore, the results offer practical value for investors seeking to align market strategy with sharia principles, for issuers aiming to strengthen sustainability reporting practices, and for regulators designing policies to enhance the resilience and competitiveness of the Islamic capital market in a rapidly evolving global financial landscape.

II. LITERATURE REVIEW

Shariah Finance Theory

Islamic financial theory provides the grand conceptual foundation of this study. The system is rooted in the Qur'an, Sunnah, and the fiqh tradition, emphasizing justice (al-'adl), transparency, and the prohibition of *riba*, *gharar*, and *maysir*. Economic activities are viewed not only as profit-seeking mechanisms but as forms of worship (ibadah) whose outcomes must contribute to societal welfare. The Qur'anic narrative of Prophet Yusuf (Qur'an 12:47–49) is widely interpreted as an early example of strategic resource management and sustainability. Classical works such as Ibn Kathir's tafsir and contemporary Islamic economists such as Chapra and Al-Sadr reinforce that economic governance must protect human dignity, prevent injustice, and safeguard public interest.

This paradigm directly relates to sustainable investment because Islamic economics demands preservation of long-term wellbeing—aligning naturally with modern ESG principles. ESG considerations such as environmental protection, social justice, and organizational integrity are consistent with *maqasid al-shariah*, which prioritizes the preservation of life, wealth, intellect, lineage, and faith.

Basic Concepts of Islamic Economics

Islamic economics situates market behaviour within a moral-spiritual framework. Wealth is a trust from God (amanah), and its circulation must prevent exploitation and support equitable development. Scholars like Hallaq, Qardhawi, and Soemitra highlight Islamic economics as a value-driven discipline that balances efficiency with ethical commitments. In the Indonesian context, the rapid growth of Islamic financial institutions reflects rising public preference for Islamically compliant investments.

Practice of Islamic Economics in Indonesia

Indonesia is home to one of the world's largest Islamic financial ecosystems. The government, through OJK and BAZNAS, actively promotes Islamic capital markets, Islamic banking, zakat management, and halal industry integration. According to OJK reports, the development of the Jakarta Islamic Index (JII) and broader Islamic indices signals strengthening demand for shariah-compliant equities. Several studies (Wilson, 2007; Huda & Nasution, 2007) argue that Indonesia's Islamic market performance is increasingly influenced by global ethical investing trends.

Investment and Shariah Capital Market Framework

Investment in Islam must avoid prohibited elements and must be linked to real economic activity (Chapra, 2001). The shariah capital market applies screening methods to filter companies based on; (1) business activities and (2) financial ratio thresholds. Instruments such as sukuk and syariah equities continue to grow due to rising investor awareness and stronger regulatory frameworks (Iqbal, 2008).

Islamic Stocks

Shariah-compliant stocks must meet screening criteria set by OJK, ensuring that operations and capital structure do not violate Islamic principles. Investors treat syariah stocks as both financial and moral assets. Literature notes that shariah stocks sometimes exhibit unique volatility patterns, influenced by investor sentiment, macroeconomic dynamics, and ethical concerns.

Basic ESG Concepts

Environmental, Social, and Governance (ESG) principles represent a framework used worldwide to evaluate the sustainability performance of companies. ESG has expanded from niche ethical investing to a mainstream requirement due to climate risks, governance scandals, and social responsibility pressures. Reports such as GSIA (2023) highlight that sustainable investment assets continue to grow globally.

ESG and Sustainable Finance

Research shows that ESG performance can influence firms' risk profiles, cost of capital, and stock volatility. For instance:

1. High emissions often increase risk perception among investors.
2. Strong governance reduces information asymmetry.
3. Positive social performance boosts brand value and long-term resilience.

Indonesian research literature (Rambe & Armayanti, 2024; Rismanto, 2024) shows that ESG integration is increasingly prominent across capital markets, though adoption remains uneven across industries—especially extractive sectors like energy and mining.

Maqasid al-Shariah and ESG

Many scholars like Qaradawy argue that ESG aligns naturally with Islamic moral objectives.

Examples:

1. Environmental → preservation of life (*hifz al-nafs*) and the earth as divine trust.
2. Social → justice and protection of wealth (*hifz al-mal*).
3. Governance → accountability (*amanah*) and prevention of corruption.

Thus, ESG is positioned not as a Western ethical add-on but as an embedded Islamic principle (Baharuddin, et al., 2020).

Previous Studies

Farhan (2024) examines how ESG compliance influences the balance between risk and return in sustainable investment strategies. The study finds that the impact of ESG implementation varies across companies—some firms experience higher market valuation due to strong ESG adherence, while others show no significant change. The study highlights that external factors such as government regulation and investor awareness play a crucial role in determining the effectiveness of ESG in enhancing stock performance. Although aligned with ESG-related themes, the research mainly focuses on return-based financial indicators and does not specifically analyze volatility or the context of the Jakarta Islamic Index (JII).

Lee and Isa (2023) analyze ESG practices among Shariah-compliant companies in Malaysia and their relationship with financial performance. Their findings indicate that companies with higher ESG scores generally experience lower stock price volatility, suggesting that strong ESG implementation enhances market stability for Islamic equities. However, the magnitude of this effect varies depending on regulatory environments and global market conditions. Unlike the present study, their research focuses on broader corporate performance metrics such as ROA, ROE, and Tobin's Q, and applies a Malaysian dataset rather than Indonesian syariah stocks.

Alberg et al. (2008) evaluate stock market volatility using asymmetric GARCH-family models on the Tel Aviv Stock Exchange (TASE). The study concludes that the EGARCH model with a skewed Student-t distribution most accurately captures volatility dynamics, outperforming both standard GARCH and other competing models due to its superior ability to model asymmetry and excess kurtosis. This research demonstrates the importance of selecting robust econometric tools for volatility estimation. Although methodologically relevant, the study examines a conventional market index and does not incorporate ESG factors or Islamic financial instruments.

III. METHODOLOGY

Variable Overview

This study employs a quantitative research approach using monthly time-series data to analyze the effects of macroeconomic indicators, ESG performance, and religiosity on the stock price volatility of PT Alamtri Resources during the period 2020–2023. The methodological framework consists of four primary components: data sources, operational definitions of variables, model development, and analytical techniques.

The data used in this study were obtained entirely from secondary sources published by authoritative institutions. Monthly stock price data of PT Alamtri Resources and the Jakarta Islamic Index (JII) were collected from the Indonesia Stock Exchange (IDX). Inflation data were sourced from the Central Bureau of Statistics (BPS). Environmental performance indicators, specifically greenhouse gas (GHG) emissions, were extracted from the company's sustainability reports. Meanwhile, religiosity data—proxied by national zakat collection—were obtained from the official publications of BAZNAS. All datasets cover the period from January 2020 to December 2023. The selection of this period reflects both the availability of complete ESG disclosures and the heightened volatility caused by global energy uncertainty.

Stock volatility in this study is proxied using the monthly closing stock prices of PT Alamtri Resources for the period 2020–2023. Unlike statistical volatility measures that rely on log returns or variance calculations, this research uses the direct month-to-month fluctuations in the stock price as the indicator of volatility. This proxy allows the analysis to capture actual price changes as they occur in the market and provides a straightforward representation of volatility consistent with the available data.

Inflation (X1) reflects changes in the general price level and is widely used as a macroeconomic indicator affecting investment risk. Data is taken from BPS. The JII Index price (X2) represents the performance of sharia-compliant equities in Indonesia. It acts as a market sentiment indicator relevant to the Islamic capital market. Greenhouse gas emissions (X3) are used as the ESG variable (Environmental pillar). The data represent annual emissions intensity as reported in PT Alamtri Resources' sustainability disclosures. These values are converted into monthly series through linear interpolation. Religiosity (X4) is proxied by the total of the national zakat collection published by BAZNAS. Zakat collection is treated as a reflection of Muslim socio-religious engagement with the economy.

To examine the relationship between the independent variables and stock volatility, this study employs a multiple linear regression model using the Ordinary Least Squares (OLS) method. The baseline empirical model is expressed as:

$$VOL_t = \beta_0 + \beta_1 INF_t + \beta_2 JII_t + \beta_3 GHG_t + \beta_4 REL_t + \varepsilon_t$$

Where:

1. VOL_t = stock volatility at time t
2. INF_t = inflation rate
3. JII_t = Jakarta Islamic Index
4. GHG_t = GHG emissions
5. REL_t = religiosity (zakat collection)
6. ε_t = error term

This linear specification allows the identification of both partial and simultaneous effects of all independent variables on volatility.

Data Analysis Techniques

Several statistical tests were performed prior to the regression estimation:

1. Descriptive statistics: Summaries of mean, maximum, minimum, and standard deviation are produced to analyze the characteristics of each variable.
2. Classical assumption tests: To ensure the validity of OLS estimation, the study performs tests such as; Normality test (Jarque–Bera) and Heteroscedasticity test (Breusch-Pagan-Godfrey). These tests validate that the residuals meet OLS assumptions.
3. Regression analysis: Multiple linear regression is applied to determine the direction, magnitude, and statistical significance of each variable's effect on volatility.
4. F–test and t-test: The t-test measures partial significance of each independent variable, while the F-test evaluates joint significance across the model.
5. Coefficient of determination (R^2): R^2 is used to assess how much variation in stock volatility can be explained by the combined independent variables.

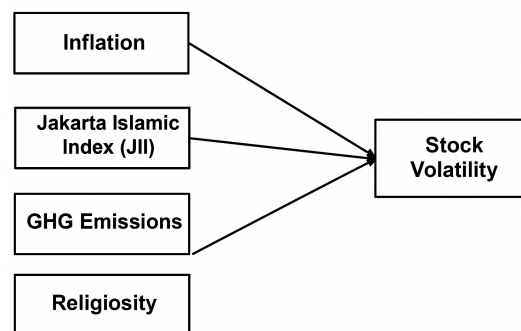


Figure 1. Research model

The use of OLS in this study is justified by several considerations. First, the model seeks to measure direct linear effects between macroeconomic indicators, ESG variables, religiosity, and stock volatility. OLS provides clear interpretability for such relationships. Second, the dataset comprises a moderate time span with regularly spaced monthly observations, making OLS an efficient estimator compared to more complex volatility modeling approaches. Third, the objective of this study is explanatory rather than predictive; therefore, OLS enables the identification of the most influential variables without imposing strict distributional assumptions beyond classical diagnostics.

IV. RESULTS AND DISCUSSION

Descriptive Statistics

The descriptive statistics provide an overview of the overall characteristics and variability of each variable used in this study: stock price volatility, inflation, JII index movement, GHG emissions, and religiosity. Throughout the 2020–2023 period, PT Alamtri Resources experienced notable fluctuations in its stock prices, reflecting the broader instability of the energy sector during and after the COVID-19 pandemic. Inflation exhibited steady upward pressure in several periods, particularly in 2021–2022 when global commodity and supply chain disruptions pushed consumer prices higher. The JII Index showed periodic but moderate changes, consistent with investor sentiment toward sharia-compliant equities.

GHG emissions, sourced from PT Alamtri Resources' sustainability reports and converted to monthly observations, displayed relatively stable but meaningful variation influenced by operational intensity. Religiosity, proxied by national zakat collection, followed a generally increasing trend that reflects post-pandemic recovery and heightened public participation in Islamic philanthropy. Collectively, these descriptive patterns suggest that the dataset contains sufficient variation to support regression analysis and hypothesis testing.

Skewness	-0.417370
Kurtosis	2.6476681
Jarque-Bera	1.641836
Probability	0.440027

Table 1. Normality test output

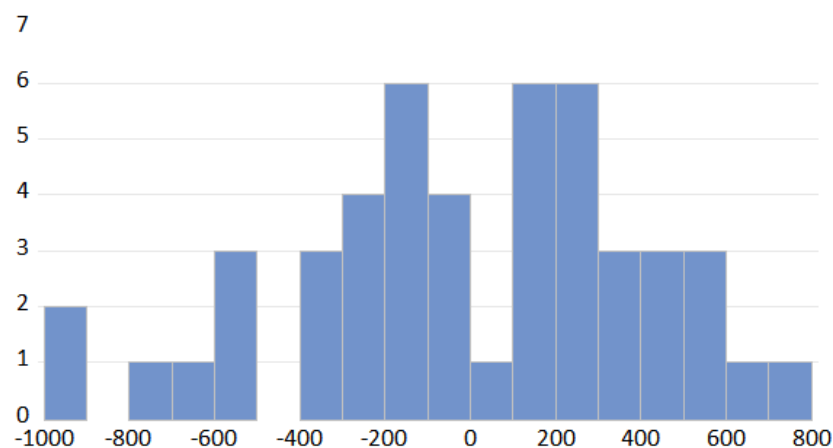


Figure 2. Histogram model for this function

Normality test

The Jarque–Bera test indicates that the residuals approximate a normal distribution with a score of 1.641836 with a probability of 0.440027. This is supported by a skewness value of -0.417, relatively close to zero, and a kurtosis value of 2.64, close to 3, indicating that the data distribution is not far from a normal distribution. Furthermore, the residual histogram also displays a pattern resembling a normal distribution, although not completely symmetrical. Therefore, it can be concluded that the assumption of residual normality is met, making the regression model suitable for further analysis.

Prob. F-statistic	0.9638
Obs*R-squared	0.9573

Table 2. Heteroscedasticity test output

Heteroscedasticity test

Based on the results of the Breusch-Pagan-Godfrey test on this research model, the F-statistic probability value was obtained at 0.9638, the Obs*R-squared probability value at 0.9573, and the Scaled explained SS probability value at 0.9800. All probability values are greater than the 0.05 significance level, so it can be concluded that the regression model does not contain heteroscedasticity problems. This indicates that the residual variance is constant across all observations within the research period, so the resulting estimate is efficient. In other words, the classical assumptions regarding homoscedasticity are met, so the model can be used for further analysis without requiring additional transformation or correction.

Ordinary Least Squares regression

Overall, the regression results indicate that the model used is able to explain data variability quite well. This is reflected in the R-squared value of 0.8157, which means that approximately 81.57% of the variation in ADRO stock volatility can be explained by the four independent variables used in the model, while the remaining 18.43% is explained by other factors outside the model. The Adjusted R-squared value of 0.7986 also indicates that the model still has good explanatory power even considering the number of independent variables included.

Variables	Prob.	Coef.
Inflation (X1)	0.0012	-0.2427
GHG emissions (X2)	0.0000	39463.31
JII price (X3)	0.0852	3.7928
Religiosity (X4)	0.0001	1.61E-09

Table 3. Probability of X1, X2, X3, X4 variables

The partial test results for each variable are as follows:

1. Emissions (X1) has a coefficient of -0.2427 with a probability value of 0.0012 (<0.05). This indicates that emissions have a significant negative effect on ADRO stock volatility. This means that each increase in emissions is associated with a decrease in stock volatility. This

suggests that the market responds negatively to high emissions, but in the short term, this tends to reduce stock price fluctuations.

2. Inflation (X2) has a coefficient of 39463.31 with a probability value of 0.0000 (<0.05). This result indicates that inflation has a significant positive effect on ADRO stock volatility. In other words, the higher the inflation rate, the higher the ADRO stock volatility, as unstable macroeconomic conditions typically increase market uncertainty.
3. The JII Price (X3) coefficient is 3.7928 with a probability of 0.0852 (>0.05). This means that the JII index price does not have a statistically significant effect on ADRO stock volatility at the 5% significance level. However, the positive direction of the coefficient indicates that an increase in the JII index price tends to increase ADRO's volatility. However, the effect is still weak and has not been proven significant.
4. Religiosity (X4) has a coefficient of 1.61E-09 with a probability of 0.0001 (<0.05). These results indicate that religiosity has a significant positive effect on ADRO stock volatility. This suggests that increasing levels of public religiosity correlate with increased trading dynamics in sharia stocks, thus influencing ADRO stock price movements.

The F-statistic value of 47.5993 with a probability of 0.000000 indicates that all four independent variables simultaneously have a significant effect on ADRO stock volatility. Thus, the overall model constructed is suitable for explaining variations in stock volatility during the study period.

The t-test results show that three independent variables—emissions, inflation, and religiosity—significantly influence ADRO stock volatility at the 5% significance level. Meanwhile, the JII price variable is insignificant, thus concluding that the price movement of the Sharia Index (JII) does not play a significant role in explaining ADRO stock price fluctuations in the 2020–2023 period. With an R-squared value of 0.8157 and an Adjusted R-squared of 0.7986, this regression model is considered to have strong predictive ability. This means that most of the variation in ADRO stock volatility can be explained by the selected independent variables. Overall, these results indicate that the OLS model used is sufficiently robust and reliable in explaining the relationship between independent factors and ADRO stock volatility.

Analysis

Regression analysis using the Ordinary Least Squares (OLS) method on the sample period January 2020–December 2023 (48 observations) produced a model that was overall significant. In summary, the OLS model showed an R-squared value of 0.8158 and an Adjusted R-squared of 0.7986, which stated that approximately 81.6% of the variation in the dependent variable (ADRO stock price volatility) can be explained by a combination of independent variables: greenhouse gas emissions (X1), inflation (X2), JII index price (X3), and religiosity (X4). The simultaneous F-test (F-statistic = 47.5993, $p = 0.0000$) showed that the independent variables together made a significant contribution to the variation in stock volatility.

Before entering into the discussion of the hypotheses per variable, it should be emphasized that the results of this estimation must be read by paying attention to the classical assumption tests that have been carried out: the residual model meets the normality test (Jarque-Bera $p = 0.4400$) and does not show heteroscedasticity according to Breusch-Pagan-Godfrey (Prob(F) = 0.9631).

The OLS results show a coefficient of EMISSIONS (X1) = -0.2428 with $p = 0.0012$ (significant at the 1% level). Statistically, this indicates that there is a significant relationship between

corporate emissions and ADRO stock price volatility, but the direction is negative: a one-unit increase in emissions is associated with a decrease in stock volatility. Intuitively, this finding may seem counterintuitive if we expect companies with high emissions to be penalized by the market so that volatility increases. There are several possible reasons for this negative result: (1) large resource-based companies with high emissions often also have company size, cash flow, or long-term contracts that stabilize stock prices so that volatility is relatively low; (2) the existence of emissions measurements that are scaled differently or indicated per output complicates the interpretation of the level; (3) this result may be affected by multicollinearity with the religiosity variable (X4) so that the sign of the coefficient X1 is sensitive to model specification.

The INFLATION coefficient (X2) = 39,463.31 with $p = 0.0000$, indicating a positive and highly significant effect. In other words, an increase in the inflation rate is associated with increased ADRO stock volatility. Theoretically, this is consistent with the expectation that higher inflation creates economic uncertainty and reduces the real value of fixed-income instruments, leading investors to shift portfolios, increasing price movements and volatility. The coefficient's magnitude should be interpreted according to the units of the inflation variable used; however, the positive direction and strong significance are robust findings in much of the macro-financial literature.

The PRICE_JII (X3) coefficient of 3.7928 with $p \approx 0.0852$ is at the 10% significance level but is insignificant at the 5% level. This indicates a positive relationship between JII index movements and ADRO stock volatility—for example, an increase in the sharia market index is followed by price movements of certain issuers—but the statistical evidence is weak. A conservative interpretation: the market index plays a role in influencing volatility, but its influence is not as strong as inflation and religiosity in this sample. Further exploration is needed, such as testing the lagged index or spillover effects between stocks within the index, to explain this relationship in more detail.

The RELIGIOSITY variable (X4) shows a positive coefficient of 1.61×10^{-9} with $p = 0.0001$, so that statistically religiosity is significantly related to the increase in ADRO stock volatility. It should be emphasized that the coefficient is very small numerically due to the scale of X4 (collection of zakat in large amounts), so practical interpretation must take scale into account: an increase in national zakat in the order of trillions of rupiah can result in a meaningful change in volatility. Conceptually, this finding opens a narrative that the level of religiosity (as reflected in the capacity and participation of the community in financial worship instruments such as zakat) can influence investment preferences or the liquidity of sharia instruments, thus having implications for price dynamics and volatility.

The model's F-test (F-statistic = 47.5993, $p = 0.0000$) confirms that the independent variables simultaneously significantly explain variations in volatility. At the partial level, the t-test results indicate that X1, X2, and X4 are significant at the 1% level (or highly significant), while X3 is only borderline (significant at the 10% level but not at the 5%). Practical implications: The hypothesis that at least some factors (macro and non-macro/ESG/religious) influence volatility is accepted, but the detailed mechanisms of influence differ across variables.

The regression results obtained using the Ordinary Least Squares (OLS) model not only provide a statistical overview of the relationships between variables but also allow for deeper economic interpretation. This analysis is crucial for understanding the dynamics of PT Alamtri Resources (ADRO) stock volatility within the context of the national economy and global trends,

particularly during the 2020–2023 period, marked by the pandemic, economic recovery, and energy market uncertainty.

First, the significant negative effect of greenhouse gas emissions on ADRO's stock volatility can be interpreted in terms of the structure of the Indonesian energy market. As a large coal-based company, ADRO has long-term contracts and a strong market share, so even though emissions levels are increasing, its stock price tends to be more stable. The market appears to respond to emissions not by increasing price fluctuations, but by taking into account relatively well-maintained short-term profitability. However, from an environmental economics perspective, this indicates a regulatory lag, where emissions issues have not yet been fully appreciated by the domestic market. This finding aligns with the fact that Indonesian investors still prioritize financial performance over sustainability.

Second, the inflation variable has a significant positive effect, consistent with macroeconomic theory and financial literature. High inflation creates market uncertainty, suppresses purchasing power, and increases corporate operating costs. Under these conditions, investors tend to reposition their portfolios, leading to more dynamic stock price movements and increased volatility. This phenomenon was evident in 2022, when inflation surged to 6–7% due to rising global energy and food prices. This situation demonstrates how fundamental macroeconomic factors remain the primary determinant of Islamic stock volatility.

Third, the JII index price shows a positive, though insignificant, coefficient. From a capital market economics perspective, this suggests that ADRO's stock movements do not fully follow the dynamics of the overall sharia index. As an energy company, ADRO is more influenced by sectoral factors such as global coal prices and national energy policies, thus its sensitivity to the JII is relatively low. However, the weak positive correlation still indicates that sharia market optimism can spread to its component stocks, including ADRO, although the influence is not dominant.

Fourth, religiosity, as proxied through zakat collection, has been shown to have a significant positive impact. From an economic perspective, increased zakat collection reflects the increased capacity of the Muslim community to fulfill its financial obligations. This phenomenon not only reflects growing religiosity but also broadens the participation base in Islamic financial instruments, including the capital market. Higher zakat collection increases the potential for liquidity in the Islamic sector, which in turn increases the dynamics of Islamic stock trading. This aligns with the government's agenda to strengthen the Islamic economic ecosystem as part of the national financial architecture.

Beyond domestic dynamics, it's important to note that global trends are trending in a different direction. In September 2025, FTSE Russell announced changes to the composition of its Emerging ESG Low Carbon Select Index, including AMMN and EMTK and removing PGAS and TLKM. Meanwhile, the FTSE Asia Pacific ex Japan ESG Low Carbon Select Index excluded several large Indonesian companies, such as BDMN, INDF, ICBP, SMGR, and UNVR. These changes reflect the increasing emphasis the global market places on sustainability, and companies that fail to meet ESG standards risk losing access to international indices. This context is an important signal for ADRO, as although the domestic market has not yet fully punished its high emissions, the global market could exert greater pressure in the future.

Future projections indicate that macroeconomic and non-macroeconomic factors will remain relevant. Inflation is expected to decline post-2023 as energy prices stabilize, potentially reducing

stock volatility. However, ESG and energy transition issues will become increasingly prominent, particularly as global investors begin to remove high-carbon companies from their portfolios. In this context, ADRO needs to strengthen its renewable energy transition strategy to maintain its attractiveness to global investors. Meanwhile, increased zakat collection and growing Islamic financial literacy will strengthen the domestic investor base, bolstering religiously oriented investors, providing opportunities for Islamic stocks to continue growing within the national financial market.

Thus, this economic analysis shows that ADRO's stock volatility is influenced not only by internal and macroeconomic factors but also by global market dynamics that increasingly emphasize sustainability. The interaction between religiosity, macroeconomics, and ESG creates new complexities that companies, investors, and regulators need to anticipate.

Furthermore, Future projections indicate a shift in the determinants of ADRO's stock volatility from solely macroeconomic factors to a more complex combination of inflation stability, global ESG pressures, and increasing domestic religiosity. This means that future ADRO stock volatility will reflect not only economic fundamentals but also investor responses to sustainability issues and Sharia values. With the increasing prominence of the energy transition agenda and the strengthening of the Sharia economy in Indonesia, companies like ADRO are at a crucial crossroads: will they be able to adapt to new trends and maintain their appeal, or will they face greater volatility due to resistance to change.

V. CONCLUSION AND RECOMMENDATION

This study set out to examine the influence of macroeconomic factors, ESG performance, and religiosity on the stock price volatility of PT Alamtri Resources during the 2020–2023 period. Using the Ordinary Least Squares (OLS) method and monthly data on inflation, the Jakarta Islamic Index (JII), greenhouse gas (GHG) emissions, and national zakat collection, the findings demonstrate that stock volatility in the Indonesian Islamic capital market is shaped by a multi-dimensional set of determinants.

First, inflation is shown to have a significant positive effect on volatility, reaffirming its role as a core macroeconomic driver that amplifies uncertainty and risk in financial markets. Second, GHG emissions exert a significant negative influence on volatility. Although counterintuitive, this result suggests that higher emissions—often associated with large-scale, operationally stable firms—may coincide with lower price fluctuations in the short term. Third, religiosity, proxied through national zakat collection, significantly affects volatility, indicating that socio-religious economic engagement influences investor behaviour and liquidity within the sharia equity ecosystem. Fourth, the JII Index is the only variable that does not significantly affect volatility, implying that firm-specific and sectoral factors play a larger role for PT Alamtri Resources compared to broader sharia market movements.

Simultaneously, all variables are jointly significant, supported by an R-squared of 0.8157 and an Adjusted R-squared of 0.7986, indicating that the model provides a strong explanatory framework for volatility. These findings reveal that Islamic-market volatility is shaped not only by conventional macroeconomic determinants, but also by sustainability indicators and religious-economic dynamics—highlighting the hybrid nature of Indonesia's Islamic capital market.

Overall, this study contributes to the literature by integrating macroeconomic, ESG, and religiosity factors into a unified volatility model, offering new insights for both academia and industry regarding the unique drivers of risk within sharia-compliant equities.

Based on the findings, several recommendations can be proposed for policymakers, investors, and future researchers:

1. For policymakers:
Regulatory bodies such as OJK and BAZNAS should strengthen the integration of sustainability and socio-religious indicators within Islamic capital market development strategies. The significant role of emissions and religiosity highlights the need for more comprehensive disclosure frameworks, ESG monitoring, and the enhancement of Islamic financial literacy programs.
2. For PT Alamtri Resources and similar firms:
The significant impact of GHG emissions underscores the importance of improving environmental transparency and accelerating energy transition initiatives. Firms should proactively adapt to global ESG standards to mitigate long-term valuation risks, especially as international indices increasingly exclude high-emission companies.
3. For investors:
Investors in the Islamic capital market should consider a broader range of factors—beyond traditional macroeconomic indicators—when assessing volatility and risk. Religiosity-driven liquidity patterns and ESG performance can provide important signals for portfolio construction, particularly for those adhering to ethical or sharia-based investment principles.
4. For future researchers:
This study focuses on a single issuer within the energy sector. Future research could expand the sample across multiple industries or employ alternative volatility measures such as log returns or GARCH-family models to capture asymmetric market behaviour. Additional ESG variables (e.g., governance quality or social responsibility metrics) may also enrich the analysis.
5. For the Islamic capital market ecosystem:
As global ESG pressures intensify and domestic religiosity continues to grow, stakeholders in the Islamic capital market should anticipate more complex interactions between sustainability, macroeconomic stability, and ethical investor behaviour. Strengthening ESG adoption and enhancing religious financial inclusion can help stabilize market dynamics and attract both domestic and international investors.

REFERENCES

- Al-Sadr, M. B. (1981). *Iqtisaduna, Our Economics Volume One, Part One*. World Organization for Islamic Services (WOFIS)
- Baharuddin, A., Ismail, M. Z., Hassan, N. M. N., & Sivaraska, S. (2020). *Science for Sustainable Development: Islamic and Interfaith Perspectives*. Penerbit IKIM.
- Chapra, U. (2001). *Masa Depan Ilmu Ekonomi: Sebuah Tinjauan Islam*. Gema Insani Press
- Huda, N., & Nasution, M. E. (2007). *Investasi pada pasar modal syariah*. Penerbit Kencana
- Iqbal, M. (2008). *Dinar Solution: Dinar Sebagai Solusi*. Gema Insani Press
- Kamso, N. (2013). *Investing in Islamic funds: A practitioner's perspective*. John Wiley & Sons.
- Qardhawi, Y. (2002). *Islam Agama Ramah Lingkungan*. Penerbit al-Kautsar
- Al Ansari, R., & Alanzarouti, F. (2020). *ESG and Islamic finance: An ethical bridge built on shared values*.

- Alberg, D., Shalit, H., & Yosef, R. (2008). Estimating stock market volatility using asymmetric GARCH models. *Applied Financial Economics*, 18(15), 1201-1208.
- Aziz, R. M. (2019). Analysis of Ziswaf, Production Index and Sharia Stock Index on Economic Growth. *Jurnal Pasar Modal Dan Bisnis*, 1(2), 221-242.
- Farhan, M. (2024). Keseimbangan Risiko dan Imbal Hasil Dalam Strategi Investasi Berkelanjutan: Pendekatan Integratif Terhadap Faktor Lingkungan, Sosial, dan Tata Kelola Perusahaan (ESG). *Currency: Jurnal Ekonomi dan Perbankan Syariah*, 2(2), 243-264.
- Lee, S. P., & Isa, M. (2023). Environmental, social and governance (ESG) practices and financial performance of Shariah-compliant companies in Malaysia. *Journal of Islamic Accounting and Business Research*, 14(2), 295-314.
- Rambe, L. A., & Armayanti, Y. (2024). Aspek Hukum Ekonomi Syariah dalam Environmental, Social and Governance (ESG): Upaya Peningkatan Ekonomi Masyarakat yang Berkelanjutan. *Journal of Islamic Law El Madani*, 4(1), 1-13.
- Rismanto, R. (2024). Penerapan ESG (Environmental, Social, Governance) Dalam Strategi Investasi Keuangan. *INVESTI: Jurnal Investasi Islam*, 5(1), 601-616.
- Wilson, R. J. (2007). Global Islamic capital markets: review of 2006 and prospects for 2007.