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# Analysis of The Influence of Corporate Board Size and Financial Performance on Stock Return Volatility with Growth Opportunity as An Intervening Variable on The Threat of The Indonesian Energy Crisis

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ABSTRACT

The energy crisis in Indonesia has led to fluctuations in energy sector stock prices, creating uncertainty for investors. This study aims to analyze the effect of corporate board size and financial performance on stock return volatility, with growth opportunity as an intervening variable. The research employs a quantitative method using path analysis and secondary data from 14 energy sector companies listed on the Indonesia Stock Exchange during the 2018–2022 period. The results show that board size has no direct effect on stock return volatility but has an indirect effect through growth opportunity. Financial performance positively influences stock return volatility. Overall, growth opportunity is proven to partially mediate the relationship between board size and financial performance on stock return volatility.



## INTRODUCTION

The global energy crisis in recent years has significantly affected economic stability and financial markets, including fluctuations in energy sector stock prices in Indonesia. Stock return volatility is a key indicator of risk and market stability, particularly in emerging economies. In Indonesia's energy sector, volatility has intensified due to fluctuations in global oil prices and ongoing energy supply uncertainty (Wahyudi and Rahmawati, 2025). This situation suggests that internal corporate factors such as governance mechanisms and financial performance may influence investor perceptions of risk. Therefore, understanding how

Corporate Board Size and Financial Performance affect Stock Return Volatility, both directly and indirectly through Growth Opportunity, is essential for evaluating firm stability amid market turbulence.

This research is grounded in Agency Theory (Jensen and Meckling, 1976), which posits that an effective board of directors can mitigate agency conflicts and improve managerial efficiency, ultimately enhancing firm value. Complementing this, Signaling Theory (SPENCE, 1978) explains how financial performance and growth opportunities act as information signals that shape investor expectations regarding firm stability and long-term prospects. Based on these theoretical foundations, Corporate Board Size and Financial Performance are expected to influence Stock Return Volatility directly, as well as indirectly through Growth Opportunity as a mediating variable.

However, previous studies have produced inconsistent findings, forming a significant research gap that this study seeks to address. Doku *et al.* (2023) found a significant relationship between board size and stock return volatility, while Merz and Trabert (2020) reported negative linear relationship between board size and volatility. Similarly, Tan and Floros (2012) found that financial performance positively affects volatility, but Abubakar (2020) reported no significant relationship in Nigeria. These contradictory results indicate the need for further empirical investigation, particularly within Indonesia's energy sector, which operates under unique structural and market conditions influenced by global energy price dynamics.

The object of this study comprises energy sector companies listed on the Indonesia Stock Exchange (IDX) during the 2018–2022 period (PT Bursa Efek Indonesia, 2024b). This sector is chosen due to its strategic role in supporting national economic resilience and its high exposure to external shocks. The motivation for this research arises from the need to clarify how corporate governance structures and financial performance interact to influence stock return volatility amid global energy uncertainty. Accordingly, the study aims to analyze the effect of Corporate Board Size and Financial Performance on Stock Return Volatility with Growth Opportunity as a mediating variable and to explain the theoretical and empirical mechanisms underlying these relationships.

## LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

### Theoretical Foundation

### Agency Theory

Agency theory (Jensen and Meckling, 1976) explains the relationship between principals and agents, where conflicts may arise if managers act contrary to shareholder interests. Governance mechanisms such as the board of directors function to monitor managerial behavior, ensure accountability, and improve strategic decision-making (Anand, 2008). An effective board can enhance oversight, strengthen transparency, and reduce risks arising from managerial opportunism, ultimately influencing firm growth prospects and shaping investor perceptions.

### Corporate Board Size

Corporate board size refers to the number of members serving on the company's board of directors or commissioners. A larger board may provide broader expertise and diverse perspectives, potentially improving decision-making quality and corporate oversight (Anand, 2008; Andres and Vallelado, 2008; Yarram and Dollery, 2015). However, excessively large boards can lead to inefficiency and slower decision processes (Yermack, 1996).

Empirical studies show mixed findings. Doku *et al.* (2023) found that board size significantly affects stock return volatility in Ghana, indicating better governance reduces risk. Conversely, Merz dan Trabert (2020) reported negative linear relationship between board size

and volatility. Thus, the board size may directly or indirectly affect stock return volatility through managerial decision quality and company growth.

### Financial Performance

Financial Performance measures a company's ability to generate profits, manage assets, and meet obligations. Common financial indicators include Return on Investment (ROI), Current Ratio (CR), Debt to Equity Ratio (DER), Total Asset Turnover (TATO), and Price to Earnings Ratio (PER) (Kasmir, 2018).

Studies such as (Adams and Ferreira, 2009; Tan and Floros, 2012) found that strong financial performance enhances investor confidence and tends to increase stock return volatility as investors adjust expectations based on profit fluctuations. However, Abubakar (2020) reported insignificant relationships between financial metrics and volatility in Nigeria, showing inconsistent evidence. Therefore, financial performance may influence stock return volatility both directly and indirectly through perceived growth prospects.

### Growth Opportunity

Growth Opportunity reflects the company's potential for future expansion, measured by the market-to-book (M/B) ratio (Simoens and Vennet, 2021). Firms with high growth opportunities attract investors due to their long-term potential but may also experience short-term price fluctuations (Ai and Kiku, 2015; Mogos, Davis and Baptista, 2021).

According by Kasmir (2018) indicated that financial performance positively affects growth opportunity since profitable companies have better access to financing and investment opportunities. The results of Haryanto *et al.* (2022) study, indicate that growth opportunity is important information for investors, because it will be related to the sustainability and prospects of the company in the future.

### Stock Return Volatility

Stock Return Volatility measures the degree of fluctuation in stock prices over time and is a key indicator of investment risk (Luthfi *et al.*, 2022). High volatility suggests uncertainty, while low volatility indicates market stability. Volatility can be influenced by both internal factors (e.g., governance, performance) and external conditions (e.g., energy crisis, economic instability) (Ebrahim, Inderwildi and King, 2014; Yang and Fu, 2025). Effective governance and strong financial fundamentals may help reduce unnecessary volatility by enhancing investor confidence in a company's stability and performance.

### Hypotheses Development

### The Relationship between Corporate Board Size and Growth Opportunity

Prior studies on board size show inconsistent results. Doku *et al.* (2023) found that board size significantly affects stock volatility through improved oversight, whereas Merz and Trabert (2020) reported negative linear relationship between board size and volatility. This inconsistency suggests that board size may influence firm growth opportunities. Therefore, the first hypothesis is proposed:

***$H_1$:*** *Corporate board size has a positive effect on growth opportunity.*

### The Relationship between Financial Performance and Growth Opportunities

Financial performance is also shown to drive growth opportunities. Glancey (1998) demonstrated that profitability increases the firm's ability to expand, while the results of Haryanto *et al.* (2022) study, indicate that growth opportunity is important information for

investors, because it will be related to the sustainability and prospects of the company in the future. Based on this evidence, the second hypothesis is proposed:

***$H_2$:*** *Financial performance has a positive effect on growth opportunity.*

### The Relationship between Corporate Board Size and Stock Return Volatility

In addition to influencing firm growth, board size may affect stock return volatility. (Andres and Vallelado, 2008; Yarram and Dollery, 2015; Merz and Trabert, 2020) argued that internal governance characteristics shape investor responses, thereby influencing volatility. (Ebrahim, Inderwildi and King, 2014; Yang and Fu, 2025) further confirmed that internal factors, including governance quality, are associated with stock price fluctuations. Thus, the following hypothesis is proposed:

***$H_3$:*** *Corporate board size affects stock return volatility.*

### The Relationship between Financial Performance and Stock Return Volatility

Financial performance plays a crucial role in shaping investor perceptions of risk and stability. Tan and Floros (2012) showed that changes in financial conditions trigger investor reactions, which can directly influence volatility. Similarly, Djazuli (2017) found that financial indicators such as profitability and leverage contribute to stock price movements in Indonesia Stock Exchange. These findings support the argument that financial performance influences market reactions; hence:

***$H_4$:*** *Financial performance affects stock return volatility.*

### The Relationship between Growth Opportunity and Stock Return Volatility

Growth opportunity is also known to influence stock price dynamics. (Ai and Kiku, 2015; Mogos, Davis and Baptista, 2021) reported that high-growth firms attract market speculation, resulting in greater volatility. The results of Haryanto *et al.* (2022) study, indicate that growth opportunity is important information for investors, because it will be related to the sustainability and prospects of the company in the future. Based on this evidence, the fifth hypothesis is proposed:

***$H_5$:*** *Growth opportunity has a positive effect on stock return volatility*.

### Examining the Direct and Indirect Effects of Corporate Board Size on Stock Return Volatility via Growth Opportunity

If board size affects growth opportunity (H1), and growth opportunity affects stock return volatility (H5), then an indirect relationship likely exists. (Ai and Kiku, 2015; Mogos, Davis and Baptista, 2021) indicated that growth opportunity acts as a pathway linking internal company characteristics to stock market outcomes. Thus, the sixth hypothesis is formulated:

***$H_6$:*** *Corporate board size indirectly affects stock return volatility through growth opportunity*.

### Examining the Direct and Indirect Effects of Financial Performance on Stock Return Volatility via Growth Opportunity

Likewise, if financial performance affects growth opportunity (H2) and growth opportunity affects stock return volatility (H5), a mediated relationship is expected. (Andres and Vallelado, 2008; Tan and Floros, 2012; Yarram and Dollery, 2015; Merz and Trabert, 2020) showed that strong financial conditions drive firm expansion, and such expansion often increases market activity and price fluctuations. Therefore, the seventh hypothesis is proposed:

***H7:*** *Financial performance indirectly affects stock return volatility through growth opportunity.*

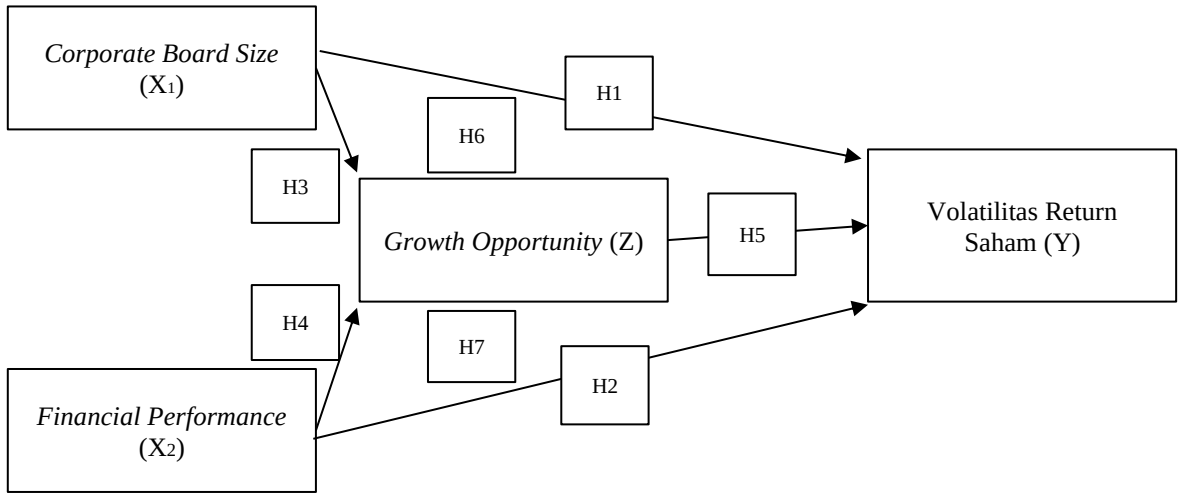


**Figure 1.** Research Framework

Source: Doku *et al.* (2023)

## RESEARCH METHODS

This study employs a quantitative research approach with a causal associative design, which aims to determine cause-and-effect relationships among measurable variables. The quantitative approach was chosen because the study tests hypotheses through numerical data and statistical models to identify the magnitude and direction of variable influence (Sugiyono, 2019).

The research object comprises energy sector companies listed on the Indonesia Stock Exchange (IDX) during the 2018–2022 period. The energy sector was selected because of its strategic role in Indonesia's economy and its vulnerability to fluctuations in global energy prices. The focus of this research is to examine how internal company factors, specifically corporate board size and financial performance affect stock return volatility, with growth opportunity serving as an intervening variable. The population includes all energy sector companies listed on the IDX from 2018 to 2022, totaling 87 companies. The sampling technique used is purposive sampling, based on the following criteria (PT Bursa Efek Indonesia, 2024b):

1. Companies must be consistently listed on the IDX during 2018–2022.
2. Companies must publish complete annual financial reports for the study period.
3. Financial reports use Rupiah (IDR) currency.

Based on these criteria, 14 companies were selected as samples, resulting in 70 firm-year observations (14 companies × 5 years). This study utilizes secondary data in the form of quantitative information collected from the following sources:

a. Annual financial reports of energy sector companies listed on the IDX.
b. Monthly stock price data obtained from the official IDX website (PT Bursa Efek Indonesia, 2024a).
c. Supporting literature, including journals, books, and previous studies related to the research variables.

Data were collected through documentation and literature review techniques:

1) Documentation involves collecting published financial reports, stock price data, and other official publications.

2) Literature review involves reviewing previous studies and theories that form the basis for the conceptual framework and hypothesis development.

**Table 1.** Operational Definition of Variables

| Variable | Type | Indicator/Measurement | Formula |
|---|---|---|---|
| Corporate Board Size (X1) | Independent | Number of directors/board members | CBS = Total number of board members |
| Financial Performance (X2) | Independent | a. Debt to Equity Ratio (DER)<br>b. Return on Investment (ROI)<br>c. Current Ratio (CR)<br>d. Total Asset Turnover (TATO)<br>e. Price to Earnings Ratio (PER) | DER = $\frac{Total\ Debt}{Total\ Equity}$<br>ROI = $\frac{Net\ Profit}{Total\ Investment}$ x 100%<br>Current Ratio = $\frac{Current\ assets}{Current\ Liabilites}$<br>Asset Turnover Ratio = $\frac{Net\ Sales}{Total\ Assets}$<br>P/E Ratio = $\frac{Market\ Price\ Per\ Share}{Earning\ per\ share\ (EPS)}$ |
| Growth Opportunity (Z) | Intervening | | M/B Ratio = $\frac{Stock\ Market\ Value}{Stock\ book\ value}$ |
| Stock Return Volatility (Y) | Dependent | | $\sigma = \sqrt{\frac{1}{n-1}\sum_{t=1}^{n}(R_t - \underline{R})^2}$ |

Source: (Kasmir, 2018; Luthfi *et al.*, 2022; Doku *et al.*, 2023)

Data analysis was conducted using Path Analysis to examine both direct and indirect effects among variables. Path Analysis is appropriate for testing causal relationships involving mediating variables within a regression-based framework, as widely recommended in quantitative mediation studies (Hayes, 2022). Prior to hypothesis testing, the classical assumption tests were performed, including the Normality Test, Multicollinearity Test, Heteroskedasticity Test, and Autocorrelation Test, following the diagnostic procedures suggested by Gujarati (2004) to ensure the validity and reliability of the regression estimates.

Hypothesis testing was conducted using the t-test (partial effect), F-test (simultaneous effect), and Adjusted $R^2$ to assess the explanatory power of each model, aligning with the regression analysis procedures proposed by (Ghozali, 2018). The mediation effect in the model was examined by observing both direct and indirect paths, consistent with the approach recommended by (Hayes, 2012) in the PROCESS framework, where significant indirect effects indicate the presence of meaningful mediation. The statistical models estimated in this study are:

**Equation 1:** Direct effect of Corporate Board Size and Financial Performance on Growth Opportunity

$$Z=\beta_0+\beta_1X_1+\beta 2X_2+\varepsilon 1$$

**Equation 2:** Effect of Corporate Board Size, Financial Performance, and Growth Opportunity on Stock Return Volatility

$$Y=\beta_0+\beta_1X_1+\beta 2X_2+\beta_3Z+\varepsilon 2$$

Where:

Y : Stock Return Volatility
Z : Growth Opportunity
$X_1$ : Corporate Board Size
$X_2$ : Financial Performance

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$\beta_0$ : Constant
$\beta_1$–$\beta_3$ : Regression coefficients
$\varepsilon_1$, $\varepsilon_2$ : Error terms

All analyses were performed using SPSS software to examine the strength of relationships and mediation effects between variables.

**Table 2.** Sample Profile

| No | Company Code | Company Name |
|---|---|---|
| 1 | AIMS | Akbar Indo Makmur Stimec Tbk. |
| 2 | AKRA | AKR Corporindo Tbk. |
| 3 | ARTI | Ratu Prabu Energi Tbk. |
| 4 | BOSS | Borneo Olah Sarana Sukses Tbk. |
| 5 | CNKO | Exploitasi Energi Indonesia Tbk. |
| 6 | DWGL | Dwi Guna Laksana Tbk. |
| 7 | ELSA | Elnusa Tbk. |
| 8 | FIRE | Alfa Energi Investama Tbk. |
| 9 | KOPI | Mitra Energi Persada Tbk. |
| 10 | PKPK | Perdana Karya Perkasa Tbk. |
| 11 | PTBA | Bukit Asam Tbk. |
| 12 | RUIS | Radiant Utama Interinsco Tbk. |
| 13 | SMMT | Golden Eagle Energy Tbk. |
| 14 | SMRU | SMR Utama Tbk. |

Source: Processed Primary Data (2025)

## DATA ANALYSIS RESULTS & DISCUSSION

### Descriptive Statistics

Table 1 presents the descriptive statistics of the main variables in this study, which include Corporate Board Size, Financial Performance, Growth Opportunity, and Stock Return Volatility.

**Table 1.** Descriptive Statistics of Research Variables

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Corporate Board Size | 70 | 6 | 16 | 9,47 | 2,512 |
| Debt To Equity | 70 | 0,16 | 43,09 | 3,0913 | 6,31779 |
| Return on Investment | 70 | 0 | 4 | 0,1396 | 0,48196 |
| Current Ratio | 70 | 0,01 | 146,13 | 5,1909 | 21,6289 |
| Total Asset Turnover Ratio | 70 | 0 | 2,25 | 0,653 | 0,54682 |
| Price To Earning | 70 | -8,36 | 3459,82 | 105,68 | 418,407 |
| Volatilitas Return Saham | 70 | 0 | 21,73 | 2,8499 | 5,68901 |
| Growth Opportunity | 70 | -16,32 | 17602,8 | 412,923 | 2125,93 |
| Valid N (listwise) | 70 | | | | |

Source: Processed Primary Data (2025)

The table shows that the average board size is around five members, indicating a moderate governance structure. Financial performance and growth opportunity vary

considerably among companies, suggesting heterogeneous conditions in Indonesia's energy sector.

### Path Analysis Results

The data were analyzed using path analysis to determine both direct and indirect effects among the variables. Before testing the hypotheses, classical assumption tests were conducted, showing that all data met normality, multicollinearity, and heteroscedasticity requirements.

**Model 1:** Effect of Corporate Board Size and Financial Performance on Growth Opportunity.

**Table 2.** Regression Results – Model 1

| Variable | Coefficient (β) | t-statistic | Sig | Result |
|---|---|---|---|---|
| Corporate Board Size (X1) | 0,308 | -2,387 | 0,020 | Significant |
| Financial Performance (X2) | 0,011 | 0,067 | 0,047 | Significant |
| $R^2$ = 0,171 | F = 18,772 | Sig. F = 0,000 | | |

Source: Processed Primary Data (2025)

Corporate Board Size and Financial Performance both have a positive and significant effect on Growth Opportunity. This means that larger boards and higher profitability are associated with better future growth potential.

**Model 2:** Effect of Corporate Board Size, Financial Performance, and Growth Opportunity on Stock Return Volatility

**Table 3.** Regression Results – Model 2

| Variable | Coefficient (β) | t-statistic | Sig | Result |
|---|---|---|---|---|
| Corporate Board Size (X1) | 0,235 | 1,906 | 0,061 | Significant |
| Financial Performance (X2) | -0,110 | -0,928 | 0,026 | Significant |
| Growth Opportunity (Z) | 0,074 | 0,643 | 0,035 | Significant |
| $R^2$ = 0,317 | F = 23,844 | Sig. F = 0,000 | | |

Source: Processed Primary Data (2025)

The results indicate that Financial Performance exerts a positive and significant influence on Stock Return Volatility at the 1% level ($p < 0,01$). This finding suggests that stronger or fluctuating financial indicators tend to trigger greater market reactions, leading to heightened volatility as investors adjust their expectations based on financial outcomes. Growth opportunity also demonstrates a significant positive effect on stock return volatility ($p < 0,05$), implying that firms with higher growth prospects are more exposed to fluctuating market expectations and speculative responses, resulting in more pronounced price movements.

In contrast, corporate board size does not exhibit a direct significant effect on volatility. This absence of direct influence suggests that the role of the board may operate through different pathways particularly through its impact on strategic decisions that enhance growth prospects indicating an indirect effect mediated by growth opportunity rather than a direct relationship with stock return volatility.

### Indirect (Mediation) Effect Test

Using the Sobel test, growth opportunity is found to partially mediate the relationship between corporate board size and stock return volatility, as well as between financial performance and stock return volatility.

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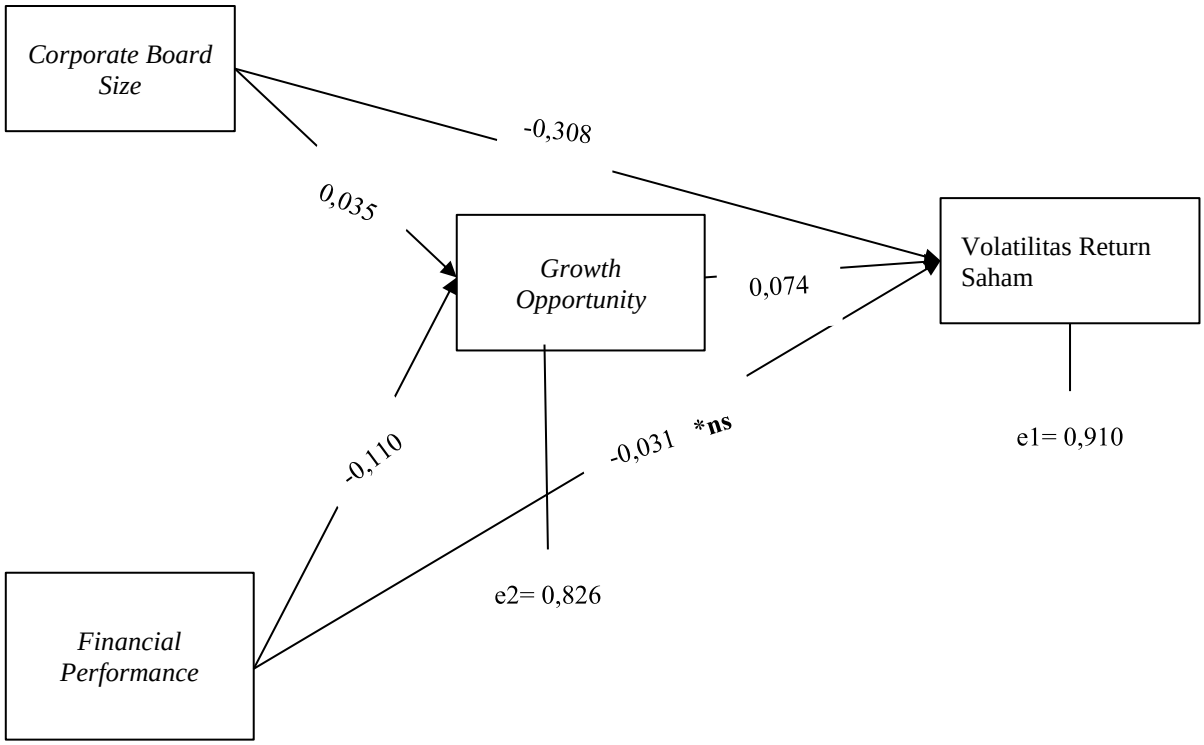


*Note: p < 0,05; ns = not significant*

**Figure 1.** Path Analysis Test Results

Source: Processed Primary Data (2025)

**Discussion**

From the results above, the hypothesis testing can be summarized as follows:

**Table 4.** Hypothesis Evaluation

| Hypothesis | Statement | Result |
|---|---|---|
| H1 | Corporate Board Size positively affects Stock Return Volatility | Rejected |
| H2 | Financial Performance positively affects Stock Return Volatility | Accepted |
| H3 | Corporate Board Size positively affects Growth Opportunity | Accepted |
| H4 | Financial Performance positively affects Growth Opportunity | Accepted |
| H5 | Growth Opportunity positively affects Stock Return Volatility | Accepted |
| H6 | Corporate Board Size indirectly affects Stock Return Volatility through Growth Opportunity | Accepted (Partial Mediation) |
| H7 | Financial Performance indirectly affects Stock Return Volatility through Growth Opportunity | Accepted (Partial Mediation) |

Source: Processed Primary Data (2025)

These findings confirm that growth opportunity plays a crucial mediating role, linking internal company characteristics (governance and performance) to stock return volatility.

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### Comparison with Previous Research

The finding that Financial Performance positively affects stock volatility aligns with Tan and Floros (2012), who argued that profitability fluctuations lead to higher market sensitivity among investors. Meanwhile, the non-significant direct effect of Corporate Board Size on volatility is consistent with while Merz and Trabert (2020) reported negative linear relationship between board size and volatility. The mediating role of growth opportunity supports the results of Haryanto *et al.* (2022) study, indicate that growth opportunity is important information for investors, because it will be related to the sustainability and prospects of the company in the future.

### Theoretical Implications

The results reinforce Agency Theory (Jensen and Meckling, 1976), emphasizing that managerial control and governance structures can influence firm stability indirectly through performance and growth signals. In addition, the results validate Signaling Theory (SPENCE, 1978), as financial performance and growth opportunity serve as information cues to investors, affecting how they perceive company value and associated risks.

### Practical Implications

From a managerial standpoint, the findings indicate that companies need to prioritize the improvement of their financial performance in order to attract investor interest and maintain greater stability in stock price movements. Although the board of directors does not directly influence stock return volatility, its strategic role remains essential, particularly in formulating growth-oriented policies that shape market perceptions of the firm's future prospects. For investors, the results highlight the importance of considering growth opportunities as a key component in evaluating stock risk, especially within highly volatile industries such as the energy sector where expectations and market reactions tend to be more sensitive. Meanwhile, for policymakers, the study underscores the need to strengthen corporate governance regulations to ensure that boards operate effectively and that financial reporting remains transparent, thereby fostering a more stable and trustworthy capital market environment.

### Summary of Findings

In summary, the findings of this study confirm that financial performance plays a significant role in influencing stock return volatility, as fluctuations in a company's financial condition prompt corresponding reactions from the market. The results also show that corporate board size does not directly affect volatility but exerts its influence indirectly through growth opportunity, highlighting the strategic role of the board in shaping the firm's long-term prospects rather than short-term market movements.

Growth opportunity emerges as a key mediating variable that connects internal corporate characteristics with broader market dynamics, demonstrating how investor expectations regarding future expansion impact stock price behavior. Overall, the study aligns with theoretical predictions and provides empirical evidence within the context of Indonesia's energy sector, particularly during a period marked by global energy uncertainty and heightened market sensitivity.

## CONCLUSION

This study aimed to examine the effect of corporate board size and financial performance on stock return volatility with growth opportunity as an intervening variable among energy sector companies listed on the Indonesia Stock Exchange during the 2018–2022 period. The results

reveal that Corporate Board Size does not directly affect stock return volatility but has an indirect influence through Growth Opportunity. Meanwhile, Financial Performance has a significant positive effect on stock return volatility both directly and indirectly via Growth Opportunity. These findings indicate that financial performance and growth prospects are the primary determinants of stock price movements, while the board of directors plays a more strategic role in shaping corporate growth potential that enhances firm value.

Theoretically, this study strengthens Agency Theory, emphasizing the importance of effective corporate governance in mitigating agency conflicts and improving managerial performance. It also supports Signaling Theory, which suggests that financial performance and growth opportunities act as positive signals that influence investor perceptions of firm stability and prospects. Practically, the findings imply that companies should maintain strong financial performance and formulate effective growth strategies to attract investor confidence and stabilize stock volatility. Investors are encouraged to consider fundamental indicators such as profitability and growth potential when making investment decisions, particularly in the energy sector where market risks are high.

This study is subject to several limitations. The research period of five years may not fully capture long-term market dynamics, and the focus on the energy sector limits the generalizability of the findings to other industries. Future research should extend the observation period and include macroeconomic variables such as inflation, interest rates, and global energy prices to provide a more comprehensive analysis. Employing advanced analytical methods such as structural equation modeling (SEM) or panel data regression could yield deeper insights into causal relationships among variables and enrich the empirical literature on stock market volatility in Indonesia.

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