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RESEARCH ARTICLE

The Effect of ROE, DER, and EPS on Stock Prices of IDX Energy Companies (2020–2024)

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Abstract
This study examines the effects of Return on Equity (ROE), Debt to Equity Ratio (DER), and Earnings per Share (EPS) on the stock prices of companies in the IDX Energy sector during the 2020–2024 period. The research is motivated by the high volatility in the energy sector due to the COVID-19 pandemic, post-pandemic recovery, and global commodity price fluctuations, which may influence investor responses to firm fundamentals.Using a quantitative approach, this study analyzes secondary data from 15 companies selected through purposive sampling, resulting in 75 firm-year observations. The data were analyzed using panel data regression.The results show that ROE and DER have positive but statistically insignificant effects on stock prices, while EPS has a positive and statistically significant effect. Simultaneously, all variables significantly affect stock prices, with the model explaining 56.45% of the variation.These findings indicate that EPS is the most relevant financial indicator in explaining stock price movements of IDX Energy companies during the study period.

Keywords
Stock rice; Return on Equity; Debt to Equity Ratio; Earnings er Share; IDX ENERGY; Anel Data.

1 | INTRODUCTION

The energy sector remains one of the most strategic pillars of both the global and Indonesian economy. Its role is closely linked to industrial production, transportation, export performance, and government revenue. At the same time, the sector is highly sensitive to external pressures, including macroeconomic uncertainty, geopolitical conflict, and fluctuations in commodity markets. For that reason, developments in the energy industry often reflect broader economic conditions and shifts in international trade. During the 2020–2024 period, Indonesia's energy sector underwent significant changes shaped by the COVID-19 pandemic, the post-pandemic recovery, shifts in global demand, and instability in commodity prices. In 2020, the pandemic caused a sharp decline in economic activity across many countries. Restrictions on mobility, lower industrial output, and weaker trade flows reduced demand for major energy commodities, particularly oil and coal. The decline in demand placed substantial pressure on energy companies and weakened market performance across the sector. This situation was also captured in domestic financial reporting, where CNBC Indonesia described 2020 as a difficult period for the energy and mining industry due to falling demand and declining commodity prices (CNBC, 2021). In the following years, the sector began to recover as economic activity gradually resumed and commodity prices improved. Rising demand for energy, particularly during the global recovery phase, supported better performance in several energy-related firms. Even so, the recovery did not occur in a stable pattern. Market volatility remained strong, influenced by global inflation, supply-chain disruptions, policy uncertainty, and concerns over future energy demand. Such conditions were still visible in 2023, when Liputan6 reported weakness in energy-sector stocks following coal-price corrections, slowing demand, and investor caution toward global economic prospects as well as the direction of energy-transition policy (Nurmutia, 2023). These developments show that Indonesia's energy sector faced not only cyclical pressure, but also structural adjustment during a period of major economic change.

These developments align with prior academic findings indicating that the pandemic and instability in energy prices exerted a substantial effect on energy markets and stock-market performance. Chien et al. (2021) report that the COVID-19 pandemic was associated with pronounced declines in oil prices, productivity, and energy-demand indicators across several regions. Their study also notes a rise in uncertainty within stock markets and energy markets during the same period. Such evidence supports the view that shocks originating from public-health crises can quickly spread to commodity markets and financial markets, particularly in sectors closely tied to global demand and production activity. In Indonesia, Rheynaldi et al. (2023) show that the performance of energy-sector stocks is shaped not only by firm-level conditions but also by external factors, including oil prices, coal prices, exchange rates, and interest rates. These findings suggest that the valuation of energy-sector shares reflects the interaction between broad market shocks and company fundamentals. As a result, IDX ENERGY provides a relevant setting for assessing how investors respond to internal financial information when sectoral conditions are marked by price fluctuations, macroeconomic pressure, and changing expectations regarding future performance during periods of heightened uncertainty in domestic and international capital markets over time.

Although external conditions play a major role in the energy sector, stock-price movements are not determined solely by macroeconomic or commodity-related factors. Investors also rely on accounting-based indicators that reflect a firm's profitability, capital structure, and shareholder-relevant earnings performance. Among the most widely used indicators are Return on Equity (ROE), Debt to Equity Ratio (DER), and Earnings per Share (EPS). ROE reflects the firm's ability to generate returns from shareholders' equity, DER indicates the extent of leverage and financial risk, and EPS measures the amount of earnings attributable to each outstanding share. Prior studies show that these indicators are frequently associated with stock-price variation, although the strength and direction of their effects is not always consistent across sectors. Nenobais et al. (2022) conclude from a literature review that ROE and EPS generally have positive and significant effects on stock prices. Mayanti (2022) finds that EPS has a positive and significant effect in banking firms, while ROE tends to be weak. Andriani et al. (2023) report that ROE, EPS, and DER jointly affect stock prices in processed-food companies, but only ROE is individually significant. Janaina and Yudiantoro (2023) find positive effects of EPS and DER in property and real-estate firms, whereas ROE is not significant. In a more relevant context, Dewi and Rangkuti (2020) show that leverage-related variables may also matter in energy-related sectors.

The mixed results in prior studies suggest that the market relevance of ROE, DER, and EPS may depend on industrial characteristics and economic context. Most previous studies have focused on banking, manufacturing, property, or broad market samples, while relatively few studies specifically examine energy issuers included in IDX ENERGY during 2020–2024. This gap is important because energy firms operate in a sector that is highly sensitive to commodity cycles, external shocks, and changes in investor expectations. Therefore, findings from non-energy sectors cannot automatically be generalized to energy companies. Based on this gap, the present study seeks to analyze the effects of Return on Equity (ROE), Debt to Equity Ratio (DER), and Earnings per Share (EPS) on the stock prices of companies included in IDX ENERGY during 2020–2024, while also identifying which of these indicators is the most informative in explaining stock-price movements under volatile sectoral conditions.

2 | BACKGROUND THEORY

Theoretical foundation

This study is grounded primarily in signaling theory and agency theory. Signaling theory explains how firms communicate private information to external investors under conditions of information asymmetry. In capital markets, published financial information functions as a signal of firm quality, operating performance, and future prospects. Because investors do not possess the same level of internal information as managers, accounting indicators are often interpreted as observable signals that help reduce uncertainty. Accordingly, favorable financial indicators may generate a positive market response, whereas weak indicators may create skepticism and downward pressure on valuation (Connelly et al., 2011). Agency theory complements this perspective by explaining how financial decisions shape the relationship among managers, shareholders, and creditors. From an agency perspective, financing choices affect monitoring intensity, risk-sharing, and potential conflicts of interest. Debt may play a disciplinary role by limiting managerial discretion and forcing firms to meet contractual obligations, yet excessive leverage may also increase financial distress risk and reduce the residual claims available to shareholders. Therefore, stock-price valuation is influenced not only by profitability signals, but also by how investors assess the risk implications of the firm's capital structure (Jensen & Meckling, 1976). Taken together, these theories provide the conceptual basis for examining the relationship between Return on Equity (ROE), Debt to Equity Ratio (DER), Earnings per Share (EPS), and stock prices. In this study, ROE and EPS are interpreted primarily as profitability-related signals received by investors, whereas DER is interpreted through both signaling and agency perspectives because leverage may be viewed either as a sign of expansion capacity or as an indicator of financial risk, depending on firm conditions and sectoral context.

Stock price and fundamental information

Stock price represents the market value assigned to a company's equity through the interaction of demand and supply in the secondary market. In fundamental analysis, stock price is not merely a trading outcome, but also a reflection of how investors interpret accounting performance, risk exposure, and future earning capacity. When firm fundamentals are considered informative and credible, changes in accounting-based indicators can be translated into changes in expected cash flows, discount rates, and ultimately stock prices. For that reason, fundamental variables remain central to valuation research, particularly in sectors characterized by cyclical earnings and high external sensitivity. Prior Indonesian evidence also supports the relevance of accounting-based fundamentals in stock-price formation. Studies on sectoral and index-based samples show that profitability, leverage, and earnings indicators are frequently used to explain cross-firm variation in stock prices, although the strength and direction of their effects are not always uniform across sectors (Adrisa et al., 2021). Because this study uses annual accounting indicators derived from audited financial statements, the dependent variable is conceptually best aligned with the year-end closing stock price, which reflects market valuation at the end of the same accounting period. Compared with annual average prices or prices observed after financial-statement publication, year-end closing price provides a more comparable annual benchmark for linking firm fundamentals to market valuation.

Return on Equity (ROE)

Return on Equity measures a firm's ability to generate net income from shareholders' equity. As a profitability ratio, ROE reflects how efficiently management utilizes owners' capital to produce returns. Under signaling theory, a higher ROE may be interpreted as a favorable signal because it indicates that the firm is capable of producing stronger profits relative to its equity base. This can strengthen investor confidence, increase perceived firm quality, and support higher stock valuations. In this sense, ROE is expected to have a positive association with stock prices. However, the empirical role of ROE is not always stable across sectors. Some studies in Indonesia report that ROE significantly affects stock prices, while others find that its role weakens when market conditions, sectoral exposure, or other accounting indicators dominate investor attention. Adrisa et al. (2021), for example, found that profitability-related fundamentals affected stock prices in firms consistently listed in the Jakarta Islamic Index. By contrast, sector-specific evidence suggests that the explanatory power of ROE may vary depending on the industrial setting and the extent to which external shocks are already embedded in market prices. Thus, the ROE–price relationship is theoretically positive, but empirically context-dependent.

Debt to Equity Ratio (DER)

Debt to Equity Ratio measures the proportion of debt financing relative to shareholders' equity and is commonly used to capture the firm's leverage position. From an agency perspective, debt may function as a monitoring mechanism because it constrains managerial discretion and can improve capital discipline. Nevertheless, higher leverage also increases fixed financial obligations, refinancing pressure, and perceived distress risk. Consequently, the market may react negatively when DER is considered excessive relative to the firm's capacity to generate stable returns. The relationship between DER and stock price is therefore not always straightforward. In some settings, a higher DER signals greater risk and is associated with lower stock prices. In other settings, however, leverage is not necessarily interpreted as unfavorable,

particularly in sectors that are capital intensive and rely on long-term financing. Indonesian empirical studies reflect this ambiguity. Siregar (2020) reported a significant negative relationship between DER and stock price, whereas other studies indicate that leverage can be statistically weak or sector-specific in its effect. More recent energy-related evidence also shows that DER does not always emerge as the dominant determinant of market valuation. These findings justify treating DER as a theoretically negative, but empirically conditional, predictor of stock prices (Gafiarty et al., 2025; Juwita & Diana, 2020; Siregar, 2020)

Earnings per Share (EPS)

Earnings per Share represents the amount of profit attributable to each outstanding share and is one of the most visible indicators used by investors in equity valuation. Compared with broader profitability ratios, EPS speaks more directly to shareholders because it links accounting earnings to the number of shares held in the market. Under signaling theory, rising EPS is interpreted as a favorable signal of stronger earnings capacity and greater value creation for shareholders, which may increase investor demand and lead to higher stock prices. Among the three variables examined in this study, EPS is also the one most consistently supported in prior Indonesian literature. Andriani et al. (2023), Janaina and Yudiantoro (2023), and other recent studies show that EPS often has a positive relationship with stock prices and can remain significant even when other accounting ratios do not. Energy-sector evidence also suggests that EPS retains strong explanatory power in contexts characterized by earnings volatility and external commodity-price exposure. This pattern indicates that investors may place greater weight on per-share earnings information because it is easier to interpret as a direct measure of shareholder-relevant performance (Gafiarty et al., 2025; Nugroho et al., 2024).

Synthesis of previous studies and positioning of the present study

Previous studies show that stock prices are influenced by firm fundamentals, but they also reveal important inconsistencies in the relative roles of ROE, DER, and EPS. In Indonesian studies using non-energy samples, some researchers find ROE to be significant, others identify EPS as the most robust determinant, and still others report that DER plays only a weak or conditional role. These differences suggest that the market relevance of accounting indicators depends on sample composition, sector characteristics, estimation approach, and the broader economic environment. Another important pattern in the literature is that many prior studies focus on banking, food-processing, property, or broad index-based samples rather than firms in the energy sector. This matters because energy firms operate in a highly cyclical environment shaped by commodity prices, exchange-rate exposure, and macroeconomic shocks. Rheynaldi et al. (2023) show that stock returns of Indonesian energy companies are sensitive to energy-price movements, while more recent sector-specific evidence indicates that EPS may remain significant even when ROE and DER are not. These findings imply that results from non-energy sectors cannot be assumed to apply automatically to energy issuers. Accordingly, the present study positions itself as a sector-specific reassessment of the relationship between ROE, DER, EPS, and stock prices for companies included in IDX ENERGY during 2020–2024. By focusing on a period that spans the pandemic shock, post-pandemic recovery, and continued energy-market turbulence, this study seeks to clarify which fundamental indicators remain informative for explaining stock prices under structurally volatile conditions.

Conceptual framework and hypotheses development

Based on signaling theory, profitability-related indicators are expected to be positively valued by investors because they convey information about the firm's ability to generate returns. Accordingly, ROE is expected to have a positive effect on stock prices because stronger returns on equity indicate more efficient use of shareholder capital. EPS is also expected to have a positive effect because it directly reflects the portion of earnings attributable to each share. By contrast, based on agency theory and financial-risk considerations, DER is expected to have a negative effect because excessive leverage may increase default risk and reduce the attractiveness of the firm's equity to investors. Figure 1 presents the conceptual framework of this study, in which ROE, DER, and EPS are treated as explanatory variables, while stock price is the dependent variable. Based on the theoretical arguments and empirical synthesis above, the hypotheses are formulated as follows.

H1: Return on Equity has a positive effect on the stock prices of companies included in IDX ENERGY.
H2: Debt to Equity Ratio has a negative effect on the stock prices of companies included in IDX ENERGY.
H3: Earnings per Share has a positive effect on the stock prices of companies included in IDX ENERGY.

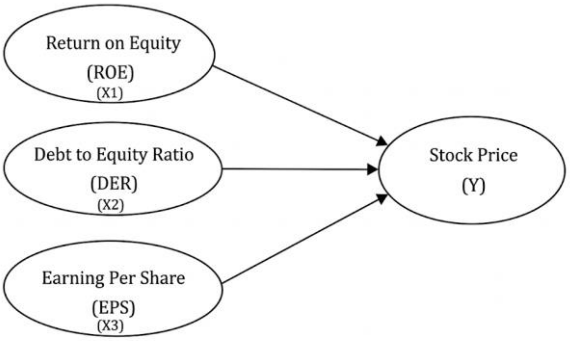

Figure 1. Research Framework

3 | METHOD

This study employed a quantitative causal-associative design to examine the effects of Return on Equity (ROE), Debt to Equity Ratio (DER), and Earnings per Share (EPS) on the stock prices of companies included in IDX ENERGY during 2020–2024. The study used secondary data obtained from audited annual reports, issuer disclosures, and market information published by the Indonesia Stock Exchange (IDX) and the official websites of the respective firms. Because the analysis combined cross-sectional variation across firms with time-series variation across annual observations, panel data regression was considered the most appropriate analytical approach for addressing the research objective (Madany et al., 2022).

The unit of analysis in this study was the firm-year observation. Accordingly, each sampled company contributed one annual observation for each year in the 2020–2024 period. The use of annual data was intended to align the accounting-based explanatory variables with audited financial statements and year-end market values, thereby improving comparability across firms and reducing inconsistencies that may arise from mixed reporting intervals. The population consisted of all companies classified in IDX ENERGY during 2020–2024, from which 91 firms were identified at the initial stage.

The sample was selected using purposive sampling to ensure data completeness, comparability, and continuity throughout the observation period. A company was included in the final sample if it met the following criteria: (1) it was not suspended during 2020–2024; (2) it had completed its initial public offering before 2020 and remained listed through December 31, 2024; (3) it published complete audited annual reports for the 2020–2024 period; (4) it provided complete data for ROE, DER, EPS, and year-end closing stock price, with non-zero equity; and (5) it was consistently included among the top 15 firms by market value during the observation period. The final criterion was applied to focus the analysis on the most representative and consistently valued issuers within IDX ENERGY, while also improving comparability across firms and reducing distortions from very small or thinly traded issuers whose market prices may be less stable as annual valuation benchmarks. After applying these criteria, 15 companies remained in the final sample. With five annual observations for each company, the study analyzed 75 balanced panel observations.

The dependent variable in this study was stock price, measured using the year-end closing price of each company's shares, expressed in Indonesian rupiah per share. This measure was selected because it reflects the market valuation observed at the end of each accounting year and is directly comparable with the annual financial indicators used as explanatory variables. The independent variables consisted of ROE, DER, and EPS. ROE was measured as net income divided by total equity, reflecting the firm's ability to generate returns from shareholders' funds. DER was measured as total liabilities divided by total equity, representing the extent to which corporate financing relied on debt relative to shareholders' capital. EPS was measured as earnings attributable to ordinary shareholders divided by the number of outstanding shares, indicating the amount of profit earned for each share.

The analysis retained the variables in their original data level rather than applying logarithmic transformation. This decision was made for three reasons. First, the study sought to preserve the economic interpretability of stock prices in rupiah per share and of the accounting indicators in their original units. Second, several observations contained negative ROE and EPS values, which make direct logarithmic transformation unsuitable without additional data treatment. Third, the main statistical concern arising from scale differences was not coefficient consistency but the reliability of inference under heteroskedasticity and serial correlation; this issue was addressed through firm-clustered robust standard errors in the final model.

To estimate the relationship between the explanatory variables and stock price, this study specified the following panel regression model.

$$\text{StockPrice}_{it} = \beta_0 + \beta_1 \text{ROE}_{it} + \beta_2 \text{DER}_{it} + \beta_3 \text{EPS}_{it} + \mu_i + \varepsilon_{it}$$

Where StockPrice_{it} denotes the stock price of firm *i* in year *t*; β_0 is the intercept; β_1, β_2, and β_3 are the regression coefficients of ROE, DER, and EPS, respectively; μ_i represents the unobserved firm-specific effect; and ε_{it} denotes the idiosyncratic error term. The equation was estimated within a panel-data framework because the study sought to capture both inter-firm differences and temporal variation over the five-year observation period. Statistical inference for the study hypotheses was conducted at the 5% significance level.

The analysis was conducted in several stages. First, descriptive statistics were used to summarize the distribution of each variable, including the mean, minimum, maximum, and standard deviation. This stage provided an overview of the data pattern and helped identify the degree of variation across firms and across years. Second, panel-model selection was conducted to determine the most appropriate baseline estimator among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The selection process followed a standard sequence using the Chow test, the Hausman specification test, and the Breusch–Pagan Lagrange Multiplier test (Breusch & Pagan, 1980; Chow, 1960; Hausman, 1978). The Chow test was used to compare CEM and FEM, the Hausman test was used to compare FEM and REM, and the Breusch–Pagan Lagrange Multiplier test was used to compare CEM and REM.

Third, diagnostic testing was performed to evaluate the statistical adequacy of the model. Multicollinearity among the independent variables was assessed using the Variance Inflation Factor (VIF). In this study, VIF values materially below 10 were treated as indicating no severe multicollinearity, while still being interpreted cautiously because threshold-based rules of thumb should not be applied mechanically (O'Brien, 2007). Heteroskedasticity was assessed using the Breusch–Pagan test, while serial correlation in the panel structure was assessed using the Wooldridge test for panel-data models as operationalized by Drukker (2003). Fourth, because panel-data estimators may produce biased conventional standard errors in the presence of heteroskedasticity and serial correlation, statistical inference was based on robust standard errors clustered at the firm level. The use of robust covariance estimation follows the logic that consistent inference can still be maintained even when classical error assumptions are violated in panel settings (Arellano, 1987). The entire analytical procedure was conducted using STATA.

To strengthen construct validity, all variables were operationalized using widely accepted financial-ratio formulas and were measured only from audited annual reports and official market disclosures. To improve reliability, the data were cross-checked between IDX publications and the financial reports of the respective issuers before estimation. In addition, the use of a balanced panel and clearly defined inclusion criteria was intended to reduce missing-data bias and improve comparability across observations.

This study also considered methodological limitations at the design stage. Because the analysis relied on annual secondary data, short-term market reactions and intra-year volatility were not directly captured. To mitigate this limitation, the study restricted the sample to firms with continuous listing status, complete audited reports, and consistent year-end market data throughout the 2020–2024 period. Furthermore, because the study used only publicly available corporate disclosures and did not involve human participants, informed consent and human-subject ethical clearance were not required.

4 | RESULTS AND DISCUSSION

4.1 Results

This section reports the empirical findings in a sequence that follows the analytical procedure of the study. The presentation begins with descriptive statistics, proceeds to panel-model selection and diagnostic testing, and then reports the final random-effects regression with firm-clustered robust standard errors. The second part of the section interprets the findings in relation to the hypotheses, the theoretical framework, and prior empirical studies, while also clarifying the practical meaning and interpretive limits of the results.

4.1.1 Descriptive statistics

Table 1 presents the descriptive statistics for the balanced panel of 75 firm-year observations. Overall, the data indicate substantial cross-firm dispersion in profitability, leverage, earnings per share, and stock prices, which supports the relevance of panel-data estimation for capturing both inter-firm heterogeneity and time variation during 2020–2024.

Table 1. Descriptive statistics of the study variables

Variable	N	Mean	Minimum	Maximum	SD
Return on Equity (ROE)	75	0.17	-2.54	1.15	0.39
Debt to Equity Ratio (DER)	75	1.49	0.09	24.85	2.91
Earnings per Share (EPS)	75	1,580.88	-69.39	26,323.72	4,141.47

Stock price	75	7,661.35	67	80,000	13,953.59

Note. SD = standard deviation. Stock price is measured as the year-end closing price in Indonesian rupiah per share.

The mean ROE of 0.17 indicates that, on average, the sampled firms generated a positive return on shareholders' equity, but the minimum value of −2.54 shows that some firms experienced deep losses relative to equity during the observation window. DER averaged 1.49, with a maximum of 24.85, suggesting that leverage structures varied widely across energy issuers. EPS and stock price also displayed substantial dispersion, as reflected in standard deviations that exceeded their respective means. This pattern suggests that the sampled firms operated under markedly different profitability conditions and market valuations, which is consistent with the structural heterogeneity of Indonesian energy companies during a period marked by pandemic disruption, commodity-price shocks, and post-pandemic adjustment.

4.1.2 Panel model selection

The selection of the most appropriate panel-data estimation model was carried out by applying the Chow test, Hausman test, and Breusch–Pagan Lagrange Multiplier (LM) test. These procedures were used to compare alternative specifications and to identify the estimator that best fits the structure of the data. The Chow test was employed to assess whether the common effect model or fixed effect model was more suitable. The Hausman test was then used to compare the fixed effect and random effect models. In addition, the Breusch Pagan LM test was conducted to examine the suitability of the random effect model. The complete results are presented in Table 2.

Table 2. Panel model selection results

Selection test	Statistic	p-value	Statistical decision	Indicated model
Chow test	$F = 172.97$	< .001	Reject H_0	Fixed effect model
Hausman test	$\chi^2 = 2.59$	.2744	Fail to reject H_0	Random effect model
LM test	$\chi^2 = 9.48$	.001	Reject H_0	Random effect model

Note. H_0 in the Chow test states that pooled OLS is adequate; H_0 in the Hausman test states that the random-effects estimator is consistent; H_0 in the LM test states that pooled OLS is adequate relative to random effects.

The Chow test rejected the pooled model in favor of a model with cross-sectional effects. However, the Hausman test was not significant, indicating that the random-effects estimator was preferable to the fixed-effects estimator because the unobserved individual effects were not statistically correlated with the regressors. The significant LM test further showed that random effects were preferable to pooled OLS. Taken together, the three tests support the use of the random-effects model as the baseline estimator for the study.

4.1.3 Diagnostic tests and estimation strategy

Before interpreting the estimated regression coefficients, several diagnostic tests were conducted to ensure that the model met the underlying statistical assumptions and produced reliable results. As presented in Table 3, the diagnostic stage covered multicollinearity, heteroskedasticity, and serial-correlation testing. The multicollinearity test was used to examine whether strong correlations existed among the independent variables. The heteroskedasticity test was performed to assess whether the variance of the error terms remained constant across observations. Meanwhile, the serial-correlation test evaluated the presence of correlation among residuals over time. These procedures were necessary to support the validity and consistency of the estimation results.

Table 3. Diagnostic test results

Test / variable	Statistic	p-value	Interpretation
VIF: ROE	3.57	—	No severe multicollinearity
VIF: DER	3.40	—	No severe multicollinearity
VIF: EPS	1.10	—	No severe multicollinearity
Breusch–Pagan heteroskedasticity test	84.42	.0001	Heteroskedasticity detected
Wooldridge serial-correlation test	28.81	.0001	Serial correlation detected

Note. VIF = variance inflation factor. Dashes indicate that no p-value applies to the VIF diagnostics.

All VIF values were well below the usual threshold of concern, indicating that ROE, DER, and EPS did not exhibit problematic multicollinearity. By contrast, the Breusch–Pagan and Wooldridge tests were significant, showing that the conventional random-effects standard errors were vulnerable to heteroskedasticity and serial correlation. Accordingly, the final model was estimated using random effects with firm-clustered robust standard errors. This adjustment preserves the substantive coefficient estimates while improving the reliability of statistical inference.

4.1.4 Final regression results and hypothesis testing

Table 4 presents the final random-effects regression model estimated using firm-clustered robust standard errors. The use of this estimation approach was intended to obtain coefficient estimates that remain reliable in the presence of within-firm error dependence and potential heteroskedasticity. The reported results serve as the main basis for evaluating the direction, magnitude, and statistical significance of the relationships between the independent variables and the dependent variable. On that basis, each research hypothesis was assessed according to the estimated coefficients and probability values.

Table 4. Random-effects regression with firm-clustered robust standard errors

Variable	Coefficient	Robust SE	p-value
Constant	2,891.18	2,094.44	.167
Return on Equity (ROE)	6,064.49	5,412.38	.263
Debt to Equity Ratio (DER)	425.29	527.69	.420
Earnings per Share (EPS)	1.94	0.16	< .001

Note. Dependent variable = year-end stock price. Coefficients are interpreted ceteris paribus.

Based on Table 5, the estimated model can be written as $StockPrice_{it} = 2{,}891.18 + 6{,}064.49ROE_{it} + 425.29DER_{it} + 1.94EPS_{it} + u_i + \varepsilon_{it}$. The coefficients for ROE and DER are positive, but their p-values exceed .05, indicating that neither variable exerts a statistically significant partial effect on stock prices within the sampled energy firms. EPS, by contrast, has a positive coefficient of 1.94 and remains highly significant. This means that, holding the other fundamentals constant, an increase in EPS is associated with a higher year-end stock price.

Table 5. Hypothesis testing and overall model fit

Code	Hypothesis statement	Direction	p-value	Decision
H1	ROE has a positive effect on stock price.	Positive	.263	Not supported
H2	DER has a negative effect on stock price.	Observed sign: positive	.420	Not supported
H3	EPS has a positive effect on stock price.	Positive	< .001	Supported
F-test	ROE, DER, and EPS jointly affect stock price.	—	< .001	Supported
R^2	Model explanatory power	—	—	.5645

Note. The joint test produced F = 488.73, p < .001. The model explains 56.45% of the variation in stock prices.

The joint significance test confirms that ROE, DER, and EPS are collectively relevant for explaining stock-price variation, even though only EPS remains individually significant. The coefficient of determination (R^2 = .5645) indicates that 56.45% of the variance in stock prices is captured by the model, while the remaining 43.55% is likely attributable to other firm-specific and macroeconomic factors not included in the specification.

4.2 Discussion

The following discussion explains each empirical finding by linking the estimated results to the theoretical framework and relevant prior studies. In line with the journal format, the interpretation relies on the statistical evidence presented in the preceding section and is used to clarify the meaning of each coefficient, sign, and level of significance. The discussion also compares findings with earlier empirical results to identify points of agreement or difference. At the time, the analysis remains cautious and objective, so that every conclusion is based only on the estimates and does not extend beyond what the regression results can justify.

The results show that ROE has a positive but statistically insignificant effect on stock prices. From a signaling perspective, ROE should function as a favorable indicator because it reflects the firm's ability to generate returns from shareholders' equity. However, the insignificant result in this study suggests that ROE was not the primary accounting signal considered by investors in IDX ENERGY companies during 2020–2024. In a shock-prone and commodity-sensitive sector, the informational role of ROE may be weakened by earnings volatility, exposure to global commodity prices, and investor attention to future cash-flow expectations rather than current accounting profitability alone. This interpretation is consistent with prior studies showing that external risk can reduce the explanatory power of profitability ratios in turbulent sectors (Chien et al., 2021; Rheynaldi et al., 2023). Empirically, this result is in line with Gafiarty et al. (2025), who also found that ROE did not exert a significant partial effect on stock prices in energy-sector companies. However, the finding differs from Adrisa et al. (2021), Andriani et al. (2023), and Juwita and Diana (2020), who reported a more significant role of ROE in other samples. This contrast reinforces the argument that the market relevance of ROE is context dependent. In the case of IDX ENERGY firms, ROE may function as supporting information rather than as a dominant valuation anchor.

The results also indicate that DER has a positive but statistically insignificant effect on stock prices. Theoretically, DER is often expected to have a negative relationship with stock prices because higher leverage may increase financial

risk, refinancing pressure, and the probability of distress. However, this relationship is not always straightforward, especially in capital-intensive industries such as energy. In this sector, debt financing may be interpreted as a normal component of long-term asset development, production expansion, and operational continuity rather than as a purely negative signal. This interpretation is consistent with Rheynaldi et al. (2023), who found that DER was positive but not significant in explaining stock returns in Indonesian energy companies, and with Gafiarty et al. (2025), who similarly reported that DER was not significant in the energy-sector stock-price context. By contrast, the result differs from Siregar (2020), who documented a significant negative relationship between DER and stock price. These differences suggest that leverage does not carry a uniform valuation meaning across sectors. For energy firms, investors may tolerate higher debt ratios when they expect commodity-linked revenue recovery, stable operating cash flows, or long-term expansion financed through liabilities.

Unlike ROE and DER, EPS has a positive and statistically significant effect on stock prices. This indicates that earnings per share is the most empirically relevant accounting indicator among the variables examined in this study. From a signaling perspective, EPS provides a more direct and easily interpretable measure of shareholder-relevant performance because it links accounting earnings to each outstanding share. Compared with ROE and DER, EPS is more readily translated into expectations about shareholder return and firm value. This result is consistent with Janaina and Yudiantoro (2023) and Gafiarty et al. (2025), both of whom found that EPS played an important role in explaining stock-price variation. However, it differs from Andriani et al. (2023), who reported that EPS was not individually significant in a processed-food sample. This comparison suggests that the informational dominance of EPS may vary across industries. For IDX ENERGY companies during 2020–2024, the result indicates that investors placed greater weight on distributable earnings capacity than on leverage or aggregate return on equity. In a volatile sector, investors may prefer indicators that are simpler, clearer, and more directly connected to expected returns.

Although ROE and DER are not significant individually, the joint significance test shows that ROE, DER, and EPS are collectively relevant in explaining stock-price variation. This indicates that the market does not rely on a single ratio alone, but rather processes firm fundamentals as a set of related signals. The model explains 56.45% of the variation in stock prices, which indicates moderate explanatory power for sectoral panel data. At the same time, the remaining unexplained variation suggests that stock prices in the energy sector are also influenced by external factors outside the model. These may include commodity-price movements, exchange-rate fluctuations, interest rates, government policy, and broader market sentiment. This interpretation is supported by Chien et al. (2021), who show that pandemic-related uncertainty and energy-price instability affect stock-market behavior, and by Rheynaldi et al. (2023), who find that Indonesian energy stock performance is influenced by oil prices, coal prices, exchange rates, and interest rates in addition to firm-level variables.

From a theoretical perspective, the findings refine the application of signaling theory and agency theory in the context of energy-sector firms. The positive but insignificant ROE result suggests that profitability signals are not automatically priced when the sector is exposed to pronounced external volatility. The positive but insignificant DER coefficient suggests that leverage in the energy sector cannot be treated as an inherently negative signal. By contrast, the strong EPS result indicates that investors assign greater valuation weight to earnings information that is more directly attributable to each share. From a practical perspective, the findings imply that investors and financial analysts should prioritize EPS as the main accounting signal when evaluating IDX ENERGY stocks, while treating ROE and DER as complementary indicators rather than stand-alone decision rules. For corporate managers, the results suggest that strategies aimed at improving earnings quality, operational efficiency, and sustainable per-share profitability are more likely to be reflected in market valuation than relying solely on leverage adjustments or short-term movements in ROE.

These findings should be interpreted within the boundaries of the research design. First, the study relies on annual observations and year-end closing prices, so short-term market reactions and intra-year volatility are not directly captured. Second, the model intentionally focuses on three internal accounting indicators and therefore does not directly estimate the influence of external drivers such as coal and oil prices, inflation, exchange rates, or policy shocks. Third, although firm-clustered robust standard errors improve statistical inference, the results should still be interpreted in conjunction with the broader economic context of the energy sector. Accordingly, the present findings explain an important, but not exhaustive, portion of stock-price formation in IDX ENERGY companies.

5 | CONCLUSIONS AND FUTURE WORK

This study concludes that firm fundamentals are relevant for explaining the stock prices of companies included in IDX ENERGY during 2020–2024, although their effects are not equally strong. ROE and DER have positive but statistically insignificant effects on stock prices, indicating that these two indicators do not function as dominant stand-alone determinants of market valuation in the sampled energy firms. By contrast, EPS has a positive and statistically significant effect, indicating that per-share earnings information is the most relevant accounting signal for investors in valuing energy-sector stocks. In addition, ROE, DER, and EPS jointly have a significant effect on stock

prices, which shows that the market still responds to these fundamentals collectively even though only EPS remains individually significant. From a practical perspective, these findings imply that investors and financial analysts should place greater emphasis on EPS when assessing stock-price prospects in IDX ENERGY companies, while treating ROE and DER as supporting indicators rather than primary decision signals. For corporate managers, the results suggest that strategies aimed at improving earnings quality, sustaining per-share profitability, and strengthening shareholder-relevant performance are more likely to be reflected in market valuation than relying solely on leverage adjustments or return-on-equity performance. This study is limited by its use of annual data, a five-year observation period, and the inclusion of only three internal accounting variables. Therefore, future research is recommended to incorporate external factors such as commodity prices, exchange rates, inflation, interest rates, and market sentiment in order to produce a more comprehensive explanation of stock-price formation in the energy sector. Future studies may also use longer observation periods or alternative panel-data specifications to capture broader market dynamics and improve the robustness of sector-specific valuation models.

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