

The Effect of Leverage, Activity, And Liquidity on Corporate Profitability: A Study of Energy Sector Companies Listed on The Indonesia Stock Exchange

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ABSTRACT

This study aims to analyze the impact of leverage, activity, and liquidity on profitability proxied by Return on Assets (ROA) in energy sector companies listed on the Indonesia Stock Exchange during the 2021–2024 period. A quantitative approach was employed using secondary data from the financial statements of 70 companies selected via purposive sampling. Analysis was conducted using panel data regression with EViews 14, utilizing the Random Effect Model (REM) and robust regression. The results indicate that leverage has no significant effect on ROA, whereas activity and liquidity have a positive and significant effect on ROA.

INTRODUCTION

Profitability is commonly used to evaluate how effectively a company converts the resources under its control into earnings. It therefore provides information about financial performance and the sustainability of business operations (Jaworski & Czerwonka, 2021; Nirawati et al., 2022). The level of profitability may also reflect management choices concerning asset use, financing, and day-to-day operations. Among the financial measures associated with these choices are leverage, activity, and liquidity ratios (Brigham & Houston, 2019; Siregar et al., 2025).

Indonesia's energy industry contributes to economic activity and supports the country's development agenda (Rismanto, 2024). Agriyani et al. (2025) reported that logistics, energy, finance, and industry together represented around 52% of capital-market capitalization and 58% of transaction value in 2023. IDX data for March 2025 placed the IDXENERGY sector at 14.9% of total exchange capitalization, equivalent to approximately IDR 1,659 trillion. The sector also includes more than 200 business entities (Purnomo et al., 2023). Because energy businesses require substantial capital and are exposed to changes in operating costs and financing arrangements, decisions about debt, asset utilization, and short-term funds are relevant to their financial outcomes (Fitriani & Wirianata, 2026).

One way to examine the profitability of energy companies is to compare their Return on Assets (ROA) over the 2021–2024 observation period.

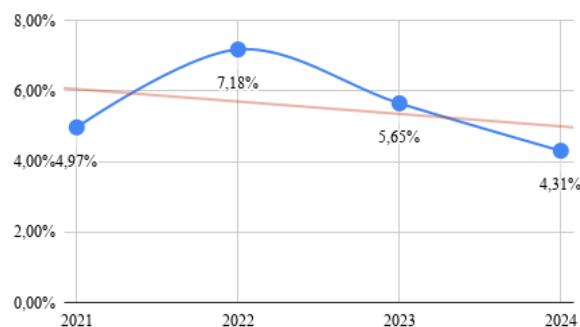


Figure 1 ROA of Energy Sector Companies, 2021–2024

Figure 1 shows that average ROA among energy-sector companies did not move consistently over the study period. The figure rose from 4.97% in 2021 to 7.18% in 2022, then fell to 5.65% in 2023 and 4.31% in 2024. The later decline points to a reduction in the sector's average ability to generate earnings from its asset base. The Ministry of Energy and Mineral Resources (2025) noted that higher production costs may weaken profits when they are not matched by improvements in operating efficiency. Eftasari and Sarumpaet (2025) also reported average leverage above 0.5 for companies in the oil, gas, and coal subsectors over 2020–2023.

The three financial ratios considered here capture different aspects of company management. Leverage reflects the extent to which debt is used to fund assets and business activities (Siswanto, 2021). The activity ratio indicates

how effectively assets are deployed to generate revenue (Shodiq et al., 2024), whereas liquidity concerns the capacity to settle short-term liabilities. Although each ratio may be connected to profitability, empirical conclusions have not been uniform. Some studies report a significant negative relationship between leverage and profitability, while others find no statistically significant association. Results for activity and liquidity likewise differ in direction and significance across studies.

The observed changes in ROA between 2021 and 2024, together with mixed findings in earlier studies, provide the basis for this research. Accordingly, this study examines whether leverage, activity, and liquidity are associated with the profitability of energy-sector companies listed on the Indonesia Stock Exchange during 2021–2024.

LITERATURE REVIEW

Agency Theory

Jensen and Meckling's (1976) agency theory describe the relationship between shareholders, as principals, and managers, as agents. Because the two parties may pursue different objectives, conflicts of interest can arise and create agency costs that affect organizational efficiency. The theory also recognizes that self-interest can influence managerial choices. In the present research context, financing decisions, the use of assets, and the management of liquid resources are relevant managerial actions that may be related to company performance and profitability (Sodri & Hirdinis, 2022).

Signalling Theory

Spence (1973) developed signalling theory to explain how information can help one party assess another party's quality or prospects. For companies, financial indicators may provide investors and creditors with signals about risk, operating performance, and financial condition. Leverage, activity, and liquidity ratios offer different information about these matters. Changes in ROA can therefore be interpreted as an indication of how effectively a company generates earnings from its assets, although the ratios must be considered alongside other relevant information.

Profitability

Profitability refers to a company's capacity to earn income through the management of its resources, assets, and capital. It is often used to assess financial results and the effectiveness of management decisions (Wantah, 2024; Putriani et al., 2025). In this study, profitability is represented by Return on Assets (ROA), calculated as net income divided by total assets.

Leverage

Leverage describes the role of borrowed funds in financing a company's assets and operations and is commonly considered when assessing financial risk. Managing debt appropriately can help preserve financial stability and flexibility (Hery, 2015). The leverage measure applied in this study is the Debt to Equity Ratio (DER), calculated by dividing total debt by total equity.

Activity

The activity ratio captures how productively a company uses its asset base to generate revenue (Jiao et al., 2023). This issue is particularly relevant to energy companies, whose operations often depend on major investments in equipment, facilities, and infrastructure. Total Assets Turnover (TATO) is used in this research to represent the sales generated in relation to total assets.

Liquidity

Liquidity concerns whether a company has sufficient current resources to cover obligations due in the short term. A higher ratio can indicate greater capacity to meet these obligations (Devi et al., 2026). Nevertheless, a very high level may also suggest that some current assets are not being used efficiently (Kasmir, 2019; Sitorus et al., 2025). This study measures liquidity with the Current Ratio (CR), calculated by dividing current assets by current liabilities.

Hypothesis Development

The Effect of the Leverage Ratio on Company Profitability

Debt financing relative to equity is one factor that may shape profitability. When borrowing becomes excessive, interest and other financing costs can increase, placing pressure on earnings. Prior studies by Aeraafi and Hartono (2024), Andriani and Dewi (2024), and Fachrian and Hidayat (2023) reported a negative and statistically significant relationship between leverage and profitability. On this basis, the first hypothesis is formulated as follows:

H1: The leverage ratio has a negative effect on company profitability.

The Effect of the Activity Ratio on Company Profitability

A company's activity ratio indicates how effectively it converts its asset investment into revenue. When assets are used more productively, they may support higher sales and strengthen the potential to earn profits (Simanullang et al., 2022). Findings reported by Mirantini et al. (2025), Sari and Ilmi (2024), and Naufal and Fatihat (2023) also indicate a positive relationship between activity and profitability. The second hypothesis is therefore:

H2: The activity ratio has a positive effect on company profitability.

The Effect of the Liquidity Ratio on Company Profitability

Liquidity can support business continuity by helping a company settle its short-term commitments on time. However, excessive holdings of current assets may indicate that available funds are not being deployed productively (Sumarlin, 2021). Research by Wildan et al. (2024), Farika and Dewi (2023), and Afriyani and Jumria (2020) reports a positive relationship between liquidity and profitability. Accordingly, the third hypothesis is stated as follows:

H3: The liquidity ratio has a positive effect on company profitability.

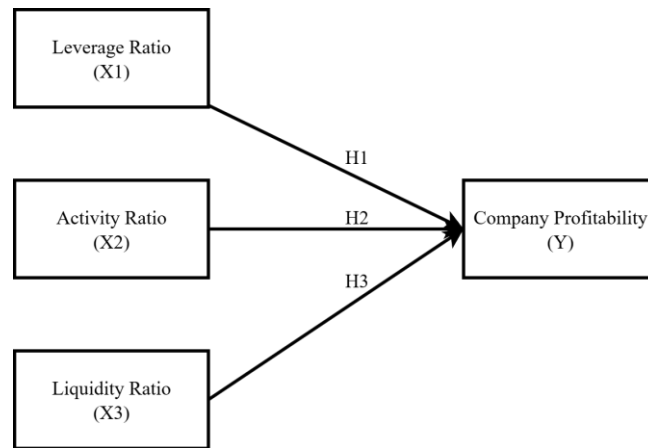


Figure 2 Conceptual Framework

METHODOLOGY

A quantitative causal design was applied to examine the relationships of leverage, activity, and liquidity with profitability among companies in the energy sector listed on the Indonesia Stock Exchange (IDX). The dataset consists of secondary information drawn from company financial statements for 2021–2024, obtained from the IDX website and individual company websites. Of the 91 companies identified in the population, firms were selected purposively if they remained listed throughout the observation period and provided complete audited financial statements for each year. The final sample comprised 70 companies, yielding 280 firm-year observations.

Profitability is the dependent variable and is measured using Return on Assets (ROA). The explanatory variables are leverage, represented by the Debt to Equity Ratio (DER); activity, represented by Total Assets Turnover (TATO); and liquidity, represented by the Current Ratio (CR). Descriptive statistics and panel-data regression were used for analysis. The Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) were compared using the Chow, Hausman, and Lagrange Multiplier tests. The study evaluates the hypotheses with the F-test and t-test and reports the coefficient of determination (R^2), using a 5% significance level unless a different threshold is explicitly stated.

RESEARCH RESULT

Descriptive Analysis

Table 1 Descriptive Statistics of Research Variables

	ROA	DER	TATO	CR
Mean	5.6009	1.3304	0.7760	2.0476
Maximum	61.760	64.610	3.1800	16.510
Minimum	-38.360	-29.140	0.0009	0.0100

Table 1 indicates that mean ROA was 5.600%, with a maximum of 61.760 for GEMS and a minimum of -38.360 for BULL. This spread reflects substantial

differences in the companies' ability to earn returns from assets. The mean DER was 1.3304 times; its maximum of 64.610 was recorded by CBRE, while the minimum of -29.140 was recorded by MTFN, reflecting variation in capital structures and equity positions. Average TATO was 0.7760 times, ranging from 0.0009 for ITMA to 3.180 for SGER, which suggests differing levels of asset-use efficiency. The mean CR was 2.0476 times, with values from 0.0100 for ARTI to 16.510 for RGAS, indicating variation in companies' short-term payment capacity.

Inferential Analysis

Table 2 Selection of the Best Model

Uji	Kriteria	Statistik	Prob	Kesimpulan
Chow	Cross-section F	9.740	0.000	FEM
Hausman	Cross-section Random	2.407	0.492	REM
LM	Breusch-Pagan	193.00	0.000	REM

Model selection relied on the Chow, Hausman, and Lagrange Multiplier (LM) tests. The Chow test returned a probability of 0.000, below 0.05, and thus favored FEM over CEM. The Hausman test produced a probability of 0.492, above 0.05, supporting REM rather than FEM. The LM test then returned a probability of 0.000, indicating that REM was preferable to CEM. Taken together, these results led to the use of the Random Effect Model for the panel regression estimates.

Table 3 Panel Data Regression (Random Effect Model)

Variabel	Coefficient	t-Statistic	Prob.
C	-1.351	-0.755	0.450
DER	-0.071	-0.770	0.441
TATO	8.070	5.708	0.000
CR	0.382	1.442	0.150
R-squared	0.109		
Adjusted R-squared	0.100		
S.E. of regression	6.524		
F-statistic	11.361		
Prob(F-statistic)	0.000		

As reported in Table 3, the model's F-statistic is 11.361, with a probability of 0.000, indicating joint statistical significance at conventional levels. In the individual estimates, DER has a coefficient of -0.071 and a probability of 0.441, while CR has a coefficient of 0.382 and a probability of 0.150; neither is statistically significant at the 5% level in this specification. TATO has a coefficient of 8.070 and a probability reported as 0.000, indicating a positive and statistically significant association with ROA. The analysis was subsequently estimated using the REM Panel EGLS White Period (Cross-section Cluster) procedure to obtain standard errors intended to be more robust to heteroskedasticity and cross-sectional correlation.

Table 4 Robust Regression Test

Variable	Coefficient	t-Statistic	Prob.	Keterangan
C	-1.351	-0.798	0.427	
DER	-0.071	-0.991	0.324	
TATO	8.070	3.090	0.002	***
CR	0.382	1.863	0.066	*
R-squared	0.109			
Adjusted R-squared	0.100			
S.E. of regression	6.524			
F-statistik	11.36			
Prob(F-statistic)	0.000			

Note:

***Significant at 1%

** Significant at 5%

*Significant at 10%

The robust estimates in Table 4 report an F-statistic of 11.361 and a probability of 0.000 for the model. The R^2 of 0.109 indicates that DER, TATO, and CR jointly account for approximately 10.9% of the observed variation in ROA; the remainder is associated with factors not included in this model and other sources of variation. DER's coefficient is -0.071 ($p = 0.324$), so its association with ROA is not statistically significant at the 5% level. TATO has a coefficient of 8.070 ($p = 0.002$), showing a positive significant relationship with ROA. CR has a coefficient of 0.382 ($p = 0.066$), which is positive and significant at the 10% level, but not at the 5% level.

DISCUSSION

The Effect of Leverage on Company Profitability

The robust regression indicates that DER is negatively related to ROA, but the estimated relationship is not statistically significant. This result is in line with Aisyah and Sopian (2025), who emphasized the possible influence of external conditions such as energy prices, public policy, and market demand on energy-company performance. It differs from findings reported by Utina et al. (2026), Susilawati et al. (2022), and Aeraafi and Hartono (2024), which identify a significant negative effect. Differences in sample composition, sector circumstances, and observation periods may help explain the contrasting results. The mean DER of 1.330 and its broad range also show that the sampled firms have markedly different financing structures.

The Effect of Activity on Company Profitability

The estimated coefficient for TATO is positive and statistically significant, suggesting that companies generating more sales relative to their assets tend to report higher ROA in this sample. This result is consistent with the direction of the findings reported by Kusumo and Digdowiseiso (2023), Sari and Ilmi (2024), Naufal and Fatihat (2023), Pulungan et al. (2024), and Mirantini et al. (2025). The average TATO of 0.776, however, indicates that asset utilization differs across the companies studied. The result should therefore be interpreted as an

association observed in this sample rather than a guarantee that increasing turnover will always produce the same profitability outcome.

The Effect of Liquidity on Company Profitability

The robust estimate for CR is positive and reaches statistical significance at the 10% level ($p = 0.066$), although it does not meet the 5% threshold. This suggests that greater short-term payment capacity may be associated with higher ROA in the sample, while the strength of the evidence is limited. The result aligns with findings reported by Susilawati et al. (2022), Sumarlin (2021), and Farika and Dewi (2023), but differs from Faizani and Djawoto (2023), who found no significant relationship. The mean CR of 2.047 and its wide range point to substantial differences in liquidity among the companies, underscoring the importance of managing current assets and liabilities proportionately.

CONCLUSIONS AND RECOMMENDATIONS

For energy-sector companies listed on the Indonesia Stock Exchange during 2021–2024, the robust regression results show that DER does not have a statistically significant relationship with ROA at the 5% level. TATO has a positive and significant relationship with ROA, while CR is positive and significant at the 10% level only. These findings suggest that asset utilization has the clearest statistical association with profitability in the estimated model, whereas the evidence for liquidity is weaker and leverage is not significant. Since the three explanatory variables account for approximately 10.9% of the variation in ROA, future studies could extend the observation period, examine a wider set of companies, and consider additional determinants. Company managers may pay attention to asset-use efficiency and prudent liquidity management, while investors should assess these ratios alongside broader business and market conditions.

ADVANCED RESEARCH

This research is limited to energy-sector companies, the 2021–2024 period, and three financial ratios. Future work could extend the period, include additional subsectors or comparison industries, and test other factors that may be relevant to profitability. Such extensions may help explain more of the variation in ROA that is not captured by the current model.

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