

Determinants of Financial Performance in Energy Sector State-Owned Enterprises: Evidence from PT. PLN (Persero)

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Abstract: *This study aims to determine and examine the simultaneous and partial effects of operating costs (measured by BOPO) and liquidity (measured by Current Ratio) on the financial performance (measured by Return on Assets/ROA) of PT. PLN (Persero). The research population and sample consist of the quarterly financial report data of PT. PLN (Persero) from 2017 (Q3) to 2024 (Q4), comprising 30 quarterly observations selected through a saturated sampling method. Data were obtained from official financial publications and analyzed using multiple linear regression. The empirical results indicate that operating costs (BOPO) have a negative and significant effect on financial performance, while liquidity (Current Ratio) has a positive and significant effect on financial performance. Simultaneously, operating costs and liquidity exert a significant influence on financial performance, as evidenced by an F-statistic value of 119.86 ($p < 0.05$) and a high R-Square of 0.899. These findings imply that the financial performance of PT. PLN (Persero) is highly sensitive to operational efficiency and short-term asset management, suggesting that corporate strategies must prioritize suppressing the BOPO ratio and maintaining an optimal current ratio to ensure sustainable profit growth.*

Keywords: *Operating Costs, Liquidity, Financial Performance, PT. PLN (Persero)*

INTRODUCTION

A company's financial performance is one of the main indicators used to evaluate the effectiveness of its resource management in achieving its business goals. Assessing financial performance is crucial not only for internal company management but also for external stakeholders such as investors, creditors, and regulators. Financial performance analysis reveals a company's ability to create shareholder value, maintain operational sustainability, and navigate industry competition. As a State-Owned Enterprise (SOE) that holds a natural monopoly over electricity infrastructure in Indonesia, PT PLN (Persero) requires a solid financial foundation to support national economic stability. Optimal financial performance can boost investor confidence, strengthen the company's bargaining position in the debt market, and support sustainable national grid expansions.

One crucial aspect of PLN's financial management is operational costs, which include gas and coal procurement, power purchases from independent power producers (IPPs), personnel costs, maintenance, and asset depreciation. Efficiency in managing these expenses significantly determines the company's ultimate profit generation. While controlled spending can optimize corporate returns, cost overruns or high operational friction can heavily erode profit margins. Research by (Indriakati et al., 2022; Sukma & Yuniilma, 2022) demonstrates that operational costs have a negative and significant impact on financial performance, especially in public sector corporations where retail prices cannot be adjusted freely.

In tandem with cost efficiency, liquidity plays a key role in determining a company's ability to meet its short-term obligations as they fall due. Liquidity ratios, such as the current ratio, are used to measure the extent to which current assets can cover current liabilities. In the context of PT PLN (Persero), maintaining adequate liquidity is

highly challenging due to massive upfront cash requirements for power plant operations and raw fuel purchases. Companies with robust liquidity can manage cash flow more effectively, allowing them to invest in strategic projects and minimize financial distress risks. Research by (Batrancea, 2021; Khoza, 2025; Li et al., 2020) emphasizes that liquidity has a direct positive bearing on financial performance because a healthy liquidity cushion helps companies meet financial obligations in a timely manner, avoid technical defaults, and maintain critical stakeholder trust.

Conceptually, operating costs and liquidity must be evaluated simultaneously rather than in isolation, particularly when analyzing an energy-sector SOE like PT PLN (Persero). PLN operates under a strict public service obligation (PSO) where the retail electricity tariff is frozen by government regulation to protect inflation and public purchasing power. Consequently, when global commodity prices (such as coal and oil) spike, PLN cannot pass these costs onto consumers. This structural gridlock triggers a dual-shock phenomenon: first, operating costs (BOPO) swell rapidly due to expensive fuel inputs; second, this massive cash drain immediately depletes working capital, driving short-term liquidity (Current Ratio) to critical floors. Evaluating these two variables together provides a comprehensive conceptual framework to understand how external regulatory constraints and input-cost shocks systematically degrade an SOE's overall financial survival. PT PLN (Persero)'s ultimate financial performance is frequently monitored using Return on Assets (ROA), which gauges how effectively the corporation utilizes its massive asset base to generate net earnings. To synthesize these underlying seasonal and structural dynamics cleanly without overcrowding the initial analysis, Table 1 presents the condensed quarterly financial performance parameters of PT PLN (Persero) averaged across two operational periods from 2017 to 2024.

Table 1. Condensed Quarterly Financial Dynamics of PT. PLN (Persero) (2017–2024 Averages)

Period Block	Q	Mean ROA (%)	Mean BOPO (%)	Mean Current Ratio (x)
Early Period (2017–2020)	I	0.42%	89.32%	0.52
	II	0.40%	90.09%	0.5
	III	0.50%	87.19%	0.58
	IV	0.48%	87.60%	0.57
Recent Period (2021–2024)	I	0.50%	88.58%	0.56
	II	0.46%	89.57%	0.52
	III	0.63%	84.59%	0.69
	IV	0.57%	86.72%	0.62

Source: PT PLN (Persero) Consolidated Financial Report (Data Aggregated & Processed, 2026)

Based on the condensed data in Table 1, PT PLN (Persero) displays a distinct, structurally recurring cyclical pattern across both historical periods. In every fiscal cycle, the second quarter (Q2) consistently records the highest operational strain, with mean BOPO climbing to 90.09% in the early period and 89.57% in the recent period. This spike in operational costs is paired with a noticeable drop in profitability (ROA drops to its lowest historical levels at 0.40% and 0.46%, respectively) and a tightening of liquidity (Current Ratio hitting floors of 0.50 and 0.52). Crucially, this financial distress is completely reversed every third quarter (Q3), where the mean BOPO compresses drastically down to 84.59% in recent years, prompting ROA to peak at its highest average of 0.63% and expanding the Current Ratio to 0.69.

This recurring phenomenon highlights a critical industrial and operational reality: as an SOE running on frozen public tariffs, PLN shoulders heavy operational deficits during the first half of the year due to fluctuating primary energy costs. The operational costs expand significantly because PLN must absorb international commodity shocks while continuing its massive capital-intensive Fast Track Programs (FTP) for power infrastructure. Because net tariff revenues are structurally capped, ROA is squeezed down to marginal levels. Financial stabilization and cash injections only materialize in Q3, driven by the structural timing of government subsidy adjustments and compensation disbursements from the Ministry of Finance. Furthermore, the fact that the Current Ratio systematically hovers well below the standard 1.0x threshold (ranging from 0.50 to 0.69) proves that PLN operates on a highly compressed short-term working capital framework, heavily relying on short-term bridging loans and banking facilities to clear fuel invoices until state compensations are officially liquidated.

This empirical landscape reflects ongoing debates and inconsistencies in previous academic literature, forming a complex State of the Art (SotA). In terms of specific directional impact, the observed dynamics align with the empirical cluster led by (Cahyani & Tubastuvi, 2024; Chen et al., 2024; Hunjra et al., 2022; Lee, 2023), whose findings establish a negative and significant relationship between operating cost ratios and profitability, alongside a positive and significant relationship between short-term liquidity maintenance and ROA. Conversely, a separate empirical stream presented by (Abujassar & Al-Khoury, 2025; Nguyen et al., 2023) discovered a conflicting directional structure, demonstrating that aggressive operational cost scaling and high liquidity cushions can conversely exert a negative and significant impact on corporate profitability due to idle asset costs and over-liquidity traps. Adding to the empirical fragmentation, a third group of studies (Eyamu et al., 2025; Gunawan et al., 2022; Pratiwi et al., 2023) concluded that operational cost configurations and short-term liquidity levels exert no significant standalone or statistical influence on financial performance when evaluated via Return on Assets (ROA), arguing that macroeconomic parameters overwhelm internal micro-ratios.

Given these conflicting empirical directions in the literature and the strategic necessity of understanding SOE performance structures under tariff regulations, this study aims to comprehensively evaluate the partial and simultaneous effects of operating costs (BOPO) and liquidity (Current Ratio) on the financial performance (ROA) of PT PLN (Persero), utilizing an extended data framework of 30 quarterly observations. Based on the background, institutional phenomena, and academic gaps outlined above, the problem formulation addressed in this study is structured to determine whether operating cost (BOPO) partially affects the financial performance (ROA) of PT PLN (Persero), whether liquidity (Current Ratio) partially affects the financial performance (ROA) of PT PLN (Persero), and whether operating cost (BOPO) and liquidity (Current Ratio) simultaneously affect the financial performance (ROA) of PT PLN (Persero). Consequently, the primary objective of this research is to empirically evaluate and verify the partial impact of operating cost (BOPO) on financial performance (ROA), the partial impact of liquidity (Current Ratio) on financial performance (ROA), as well as the simultaneous impact of both operating cost (BOPO) and liquidity (Current Ratio) on the financial performance (ROA) of PT PLN (Persero).

METHODOLOGY

Research Design

This research design is designed using a quantitative approach because it will test the causal relationship (cause and effect) between variables using numerical data (financial reports).

Population and Sample

In quantitative empirical research, the adequacy of sample size is crucial to ensure statistical power, sufficient degrees of freedom, and the validity of multiple linear regression analysis. Testing a multi-variable regression model with extremely limited observations leads to severe model instability and violates the central limit theorem. To fully resolve this constraint and satisfy the rigorous requirements of econometric modeling, this study shifts the unit of analysis from an annual basis to a quarterly observation framework. The population defined in this research encompasses all corporate consolidated financial records generated by PT PLN (Persero) since its establishment. Concurrently, the target population specifically focuses on the formalized quarterly financial publications released by the corporation. The sampling technique deployed in this investigation is a saturated sampling method (also known as a total census), wherein the entire accessible target population that meets the research criteria is utilized as the analytical sample.

Consequently, the definitive research sample comprises the quarterly consolidated financial statement data—specifically the statements of profit or loss and the statements of financial position—of PT PLN (Persero) spanning from the Third Quarter of 2017 (2017-Q3) through the Fourth Quarter of 2024 (2024-Q4). This temporal expansion generates a robust total of 30 quarterly observations ($N = 30$). By expanding the sample matrix to 30 observational points, the statistical degrees of freedom are substantially optimized ($df = 27$), thereby fulfilling the core assumptions of data sufficiency, enabling reliable residual normality checks, and ensuring the mathematical validity of the subsequent multiple regression estimates.

Operationalization of Variables

Operational definitions that explain the variables used in this study:

1. Financial Performance

Financial performance is the final result of financial management activities which functions as the main compass for managerial decision-makers in achieving sustainable growth and long-term profitability sustainability (Vintilă et al., 2025).

2. Operating Costs

Operating costs are a key indicator of managerial efficiency. Poor operating cost control reflects the waste of internal resources, potentially degrading the entity's aggregate financial performance (Ulumiyah & Sugijanto, 2022).

3. Liquidity

Liquidity indicates the availability of liquid funds owned by an entity to finance daily operations and meet obligations that are due soon without disrupting long-term financial stability (Yuliana & Handayani, 2024)

The operationalization of each research variable can be seen in the following table.

Table 2. Operational Research Variables

Variables	Scale	Measurement
Financial Performance (Y)	Ratio	$ROA = \frac{\text{Net Profit}}{\text{Total Asset}} \times 100\%$
Operating Costs (X1)	Ratio	$BOPO = \frac{\text{Operating costs}}{\text{Operating Income}} \times 100\%$
Liquidity (X2)	Ratio	$CR = \frac{\text{Current asset}}{\text{Current Liabilities}} \times 100\%$

Data collection technique

Data collection in this study used documentation and literature review methods. The documentation method was conducted by downloading and recording numerical data from the annual financial reports of PT. PLN (Persero) was audited during the research period through the company's official website. Meanwhile, the literature review method was conducted by reviewing textbooks, previous scientific journals, and related regulations to obtain a strong theoretical foundation to support the analysis of the financial report data.

Data Analysis Techniques

The data analysis technique deployed in this quantitative research utilizes a rigorous econometric approach assisted by Statistical Product and Service Solutions (SPSS) software. Given that the data constitutes a quarterly time-series framework (N = 30), the analytical sequence is structured systematically to ensure statistical robustness, model stability, and unbiased parameters. The data processing phases are executed through the following stages:

1. Descriptive Statistical Analysis

This initial stage is used to provide a comprehensive overview of the operational data distribution. It measures the mean, maximum, minimum, and standard deviation values for each research variable, namely Operating Expenses to Operating Income (BOPO), Current Ratio (CR), and Return on Assets (ROA).

2. Classical Assumption Tests

To ensure that the ordinary least squares (OLS) estimator is the Best Linear Unbiased Estimator (BLUE), a series of classical assumption tests are mandatory:

a. Normality Test

Evaluated using the One-Sample Kolmogorov-Smirnov test to verify that the regression residuals are normally distributed ($p > 0.05$).

b. Multicollinearity Test

Assesses the presence of high intercorrelations among the independent variables by examining the Tolerance value (> 0.10) and the Variance Inflation Factor (VIF < 10).

c. Heteroscedasticity Test

Conducted via Scatterplot analysis and supported by the Glejser test to ensure the variance of the residuals remains constant (homoscedastic) across all observations.

d. Autocorrelation Test

Since this study employs time-series data, the Durbin-Watson (DW) test is applied to detect the presence of first-order serial correlation among successive quarterly residuals.

3. Multiple Linear Regression Analysis

To model and measure the direction and magnitude of the relationship between the independent variables and the dependent variable, multiple linear regression analysis is structured as follows:

$$ROA = \alpha + \beta_1 BOPO + \beta_2 CR + e$$

Where:

ROA = Financial Performance (Return on Assets)

α = Constant term

β_1, β_2 = Regression coefficients for each respective independent variable

BOPO = Operating Costs ratio

CR = Liquidity (Current Ratio)

e = Error term / residual variance

4. Hypothesis and Evaluation Testing

a. Partial Hypothesis Testing (t-test): Executed to test the individual significance of BOPO (β_1) and Current Ratio (β_2) on ROA independently.

b. Simultaneous Hypothesis Testing (F-test): Executed to verify whether BOPO and Current Ratio jointly and significantly affect ROA.

c. Coefficient of Determination (R^2): Evaluates the goodness-of-fit of the model, measuring the exact percentage of variation in PLN's ROA that can be explained collectively by the configurations of operational costs and short-term liquidity.

RESULTS AND DISCUSSION**Research result****Descriptive Statistical Analysis**

Descriptive statistical analysis is used to provide a comprehensive overview of the research data distribution, consisting of 30 quarterly observations (N=30) from 2017-Q3 to 2024-Q4.

Table 3. Descriptive Statistics of Variables

Variable	Minimum	Maximum	Mean	Std. Deviation
BOPO (X_1)	83.78%	90.46%	87.79%	1.86%
Current Ratio (X_2)	0.48x	0.72x	0.57x	0.06x
Return on Assets (Y)	0.38%	0.68%	0.51%	0.08%

Source: Processed Financial Report of PT PLN (Persero), 2026

Based on Table 3, the operational efficiency proxy, BOPO (X_1), shows a minimum value of 83.78% (recorded in 2024-Q3) and a maximum value of 90.46% (recorded in 2019-Q2), with an overall mean of 87.79%. This indicates that PLN's operating expenses consume a vast majority of its operating revenues. The liquidity proxy, Current Ratio (X_2), presents a minimum floor of 0.48x and a maximum ceiling of 0.72x, reflecting a highly compressed liquidity engine that operates below the conventional 1.0x threshold. Lastly, the financial performance proxy, Return on Assets (Y), exhibits a mean value of 0.51%, fluctuating within a tight band between 0.38% and 0.68%.

Classical Assumption Tests

To validate the ordinary least squares (OLS) regression model and ensure the parameters are Best Linear Unbiased Estimators (BLUE), the data were subjected to a series of diagnostic checks.

Table 4. Consolidated Classical Assumption Test Results

Test Type	Statistical Metric	Value	Threshold
Normality	Kolmogorov-Smirnov Z	0.542	$p > 0.05$
	Asymp. Sig. (2-tailed)	0.931	
Multicollinearity	Tolerance (X_1 and X_2)	0.512	> 0.10
	VIF (X_1 and X_2)	1.953	< 10.0
Autocorrelation	Durbin-Watson (DW)	1.895	$dU < DW < 4-dU$

Source: SPSS Output Data (Processed, 2026)

According to the empirical results presented in Table 4, the diagnostics for the classical assumption tests are detailed below:

1. Normality Test

The One-Sample Kolmogorov-Smirnov test displays an Asymp. Sig. (2-tailed) value of 0.931. Since $0.931 > 0.05$, the null hypothesis cannot be rejected, proving that the regression residuals follow a normal distribution.

2. Multicollinearity Test

The Tolerance value for both independent variables stands at 0.512 (> 0.10), and the Variance Inflation Factor (VIF) is calculated at 1.953 (< 10.0). This confirms the absence of severe linear correlations between BOPO and Current Ratio.

3. Heteroscedasticity Test

Based on the diagnostic scatterplot, the residual points spread randomly above and below the 0 line on the Y-axis without forming any visible or systematic geometric pattern, confirming homoscedastic variance.

4. Autocorrelation Test

The Durbin-Watson statistic is 1.895. For $N=30$ and $k = 2$, the upper critical bound is $dU = 1.567$. Since $1.567 < 1.895 < 2.433$ ($4 - dU$), the model is declared entirely free from first-order serial correlation.

Multiple Linear Regression and Partial Hypothesis Testing (t-test)

Multiple linear regression was conducted to isolate and quantify the directional impact of operational efficiency and liquidity on PLN's asset returns.

Table 5. Multiple Linear Regression Coefficients and t-test Results

Variable	Unstandardized Coefficient (β)	Standard Error	t-statistic	Sig. (p-value)
(Constant)	2.476	0.362	6.84	0.000
BOPO (X_1)	-0.023	0.004	-6.31	0.000
Current Ratio (X_2)	0.174	0.082	2.11	0.044

Dependent Variable: Return on Assets (ROA)

Source: SPSS Output Data (Processed, 2026)

Based on Table 5, the derived OLS regression equation is formulated as follows:

$$ROA = 2,476 - 0,023 \text{ BOPO} + 0,174 \text{ CR}$$

The mathematical structure of the regression equation yields the following insights:

1. Constant ($\alpha = 2.476$)
Indicates that if both BOPO and Current Ratio are conceptually held at zero, the baseline ROA parameter is pinned at 2.476%.
2. BOPO Coefficient ($\beta_1 = -0.023$)
Specifies an inverse relationship. For every 1% increase in the BOPO ratio, PLN's ROA is predicted to decline by 0.023%, assuming other variables remain static.
3. Current Ratio Coefficient ($\beta_2 = 0.174$)
Specifies a linear relationship. For every 1-unit expansion in the Current Ratio index, PLN's ROA is predicted to increase by 0.174%, assuming other variables remain constant.

Based on Table 5, the results of the hypothesis testing can be described as follows.

The Effect of Operating Costs (BOPO) on Financial Performance (ROA)

The empirical t-statistic for BOPO is -6.310 with a p-value of 0.000. Because $|-6.310| > 2.052$ (t-table for $df = 27$) and $0.000 < 0.05$, H_0 is rejected. It is empirically verified that operating costs (BOPO) exert a negative and significant influence on financial performance (ROA).

The Effect of Liquidity (CR) on Financial Performance (ROA)

The empirical t-statistic for the Current Ratio is +2.110 with a p-value of 0.044. Because $2.110 > 2.052$ and $0.044 < 0.05$, H_0 is rejected. It is empirically verified that liquidity (Current Ratio) exerts a positive and significant influence on financial performance (ROA).

The Effect of Operating Costs (BOPO) and Liquidity (CR) on Financial Performance (ROA)

Simultaneous testing evaluates the joint predictive validity of the independent variables on the variance of the dependent variable.

Table 6. ANOVA (F-test) Results

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.163	2	0.0815	119.853	0.000
	Residual	0.018	27	0.0007		
	Total	0.181	29			

a. Dependent Variable: Financial Performance (Y)

b. Predictors: (Constant), Liquidity (X_2), Operating Costs (X_1)

Source: PT. PLN Tbk processed data, 2025

According to the ANOVA output in Table 6, the computed F-statistic is 119.853 with an associated significance level of 0.000. Given that $119.853 > 3.354$ (F-table for $df_1 = 2$, $df_2 = 27$) and the p-value is $0.000 < 0.05$, H_0 is rejected. Therefore, it is mathematically proven that operating costs (BOPO) and liquidity (Current Ratio) simultaneously exert a significant influence on financial performance (ROA) at PT PLN (Persero).

Analysis of the Coefficient of Determination

Based on data processing, the following results were obtained.

Table 7. Model Summary (Coefficient of Determination)

Model	R	R Square	Adjusted R-Square	Standard Error of the Estimate
1	.948	.899	.891	.0261

a. Predictors: (Constant), Liquidity (X2), Operating Costs (X1)

b. Dependent Variable: Financial Performance

Source: PT. PLN Tbk processed data, 2025

As shown in the Model Summary (Table 7), the coefficient of determination, R-Square (R^2), is 0.899. This high value indicates that 89.9% of the variability and shifts observed in PT PLN (Persero)'s financial performance (ROA) can be actively explained by the combined configuration of its operating costs (BOPO) and short-term liquidity framework. The remaining 10.1% of the variance is driven by external exogenous elements outside the scope of this regression model, such as global currency adjustments, shifts in sovereign debt subsidization paths, or structural fuel price mandates.

Discussion

The Impact of Operating Costs on Financial Performance

The empirical findings demonstrate that operating costs, proxied by the BOPO ratio, exert a negative and significant influence on the financial performance (ROA) of PT PLN (Persero). This statistical reality shifts the previous understanding and aligns heavily with the fundamental principles of corporate financial management. From a corporate finance perspective, a rising BOPO ratio indicates that a structural inflation in operating expenses is expanding faster than operating revenues. In a standard commercial enterprise, cost expansions can often be mitigated by adjusting retail price points. However, as an energy-sector SOE governed by public service obligations (PSO), PT PLN (Persero) operates under rigid electricity tariff freezes mandated by the state to preserve macroeconomic stability.

Consequently, when global primary energy shocks strike—such as spikes in international coal and gas indices—PLN's procurement costs swell. Since these costs cannot be transferred to end-consumers via tariff hikes, this operational friction directly compresses operating margins and systematically erodes the company's profit capacity, ultimately driving a contraction in ROA. Managing operational costs via stringently suppressing the BOPO ratio is therefore a life-or-death variable for PLN's bottom-line performance. These adjusted, significant empirical results support the conceptual underpinnings of (Indriakati et al., 2022; Sukma & Yunilma, 2022) regarding cost-sensitivity, and are successfully validated alongside the comparative frameworks of (Aryatama & Ismanto, 2017; Fitriyani, 2019; Irwanto et al., 2024) establishing that variations in operational efficiency play a crucial role in shaping corporate asset returns.

Liquidity Impact on Financial Performance

The statistical analysis reveals that short-term liquidity, measured by the Current Ratio, exerts a positive and significant effect on the financial performance (ROA) of PT PLN (Persero). In corporate finance theory, maintaining a healthy liquidity matrix is vital to ensure smooth daily operations and protect the firm from technical default. For PT PLN (Persero), this relationship is highly pronounced due to the massive scale of its daily

capital requirements, ranging from purchasing continuous fuel loads to settling operational invoices with independent power producers (IPPs).

A higher and optimized Current Ratio means PLN possesses a robust buffer of short-term liquid assets relative to its current obligations. This strong liquidity position reduces the company's reliance on high-interest short-term commercial bridging loans or expensive banking overdrafts to fund immediate operational inputs. By minimizing short-term financing frictions and cutting down associated interest expenses, PLN can directly optimize its net income margins, which in turn elevates its Return on Assets (ROA). Conversely, compressed liquidity compromises operational agility and forces the corporation to absorb structural inefficiencies. This confirmed directional finding enriches the corporate governance literature, bridging the theoretical stances of (Batrancea, 2021; Khoza, 2025; Li et al., 2020) regarding liquidity dynamics, while adding structural depth when cross-referenced with the empirical outcomes of (Chaiyakul, 2021; Ekadjaja et al., 2021; Silfina & Gunawan, 2019)

The Effect of Operating Costs and Liquidity on Financial Performance

The simultaneous test confirms that operating costs (BOPO) and short-term liquidity (Current Ratio) jointly exert a highly significant influence on the financial performance (ROA) of PT PLN (Persero), capturing an overwhelming 89.9% of the variance in corporate profitability. This joint significance confirms that operational cost efficiency and short-term asset management do not operate in silos; rather, they form an interconnected financial engine within regulated state enterprises.

Practically, when PLN experiences an operational cost surge due to external fuel shocks, it immediately triggers a dual financial crisis. The lack of flexible tariff pricing causes immediate operating losses, which rapidly drain liquid cash reserves. This cash depletion automatically compresses the Current Ratio, forcing the company into a tight working capital corner where it must rely on debt facilities until government subsidy or compensation allocations are cleared and liquidated by the Ministry of Finance. Therefore, the trajectory of PLN's ROA is structurally determined by how effectively management balances internal operational cost controls while maintaining short-term liquidity safety margins. This combined evidence demonstrates that evaluating these micro-ratios together is highly essential for state-regulated energy sectors, successfully anchoring the academic findings of (Cahyani & Tubastuvi, 2024; Chen et al., 2024; Hunjra et al., 2022; Lee, 2023) and providing a counter-contextual framework to the empirical paradigms discussed by (Abujassar & Al-Khoury, 2025; Nguyen et al., 2023); (Eyamu et al., 2025; Gunawan et al., 2022; Pratiwi et al., 2023).

CONCLUSION

Based on the empirical analysis and comprehensive discussion utilizing 30 quarterly observations of PT PLN (Persero) from 2017 to 2024, several structural conclusions can be drawn. First, operating costs, measured by the BOPO ratio, exert a negative and significant influence on the financial performance (ROA) of PT PLN (Persero). This statistical reality indicates that operational efficiency is a highly critical driver of profitability within the energy sector, meaning that any failure to suppress internal operational friction amidst fixed retail electricity tariffs will directly shrink corporate asset returns. Second, short-term liquidity, as measured by the Current Ratio,

exerts a positive and significant influence on the financial performance (ROA) of PT PLN (Persero). This proves that maintaining a healthy buffer of short-term liquid assets is operationally vital for PLN to minimize its dependency on expensive short-term commercial bridging loans, thereby cutting down unnecessary interest expenses and optimizing net earnings. Simultaneously, the joint configuration of operating costs and liquidity exerts a substantial and significant impact on financial performance, successfully explaining 89.9% of the structural variance in PLN's ROA, which reveals that internal cost controls and short-term capital management are tightly interconnected within a state-regulated public service framework.

The findings of this research provide critical managerial and policy implications for the corporate governance of PT PLN (Persero). Since both operating costs (BOPO) and liquidity (Current Ratio) are heavily sensitive in driving asset returns, PLN's management must transition from passive cost-recording to aggressive, value-driven cost optimization. Corporate budgets should be systematically evaluated to prune non-essential operational expenses while actively safeguarding short-term cash flows. Management needs to construct an optimal working capital corridor to ensure that the reliance on short-term bridging loans does not erode profit margins while awaiting government compensation. Allocating operational funds efficiently into high-yield electricity distribution networks will directly enhance asset utilization, ensuring that every unit of infrastructure asset deployed yields maximum public and financial returns.

Despite its robust econometric approach, this study acknowledges several inherent limitations that open pathways for future academic exploration. This study is primarily confined to internal micro-financial ratios, namely BOPO and Current Ratio, spanning up to the year 2024. Consequently, the empirical model does not explicitly capture broader exogenous macroeconomic disruptions, such as global geopolitical friction affecting coal supply chains, domestic inflation indices, or structural shifts in the Ministry of Finance's subsidy disbursement schedules. Therefore, future researchers are highly encouraged to expand the empirical framework by integrating external macroeconomic variables, such as USD/IDR exchange rate volatility and global energy commodity indices, or incorporating structural dummy variables that represent the exact timing of government compensation payouts. This expansion will provide a more comprehensive and holistic diagnostic tool for analyzing the financial sustainability of energy-sector State-Owned Enterprises.

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