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THE EFFECT OF OPERATING COSTS, CASH FLOWS, AND PROFITABILITY ON CORPORATE LIQUIDITY IN THE TRANSPORTATION AND LOGISTICS SECTOR (2021–2023)

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ABSTRACT
Liquidity is a crucial financial indicator, particularly for firms operating in the transportation and logistics sector, due to its direct impact on the company's ability to meet short-term obligations. This study aims to examine the influence of operating costs, cash flows, and profitability on the liquidity of transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) for the period 2021–2023. Data were collected using a documentation technique from audited financial statements of selected companies. The data analysis method applied includes descriptive statistics and panel data regression using EViews 12. Three model selection tests (Chow test, Hausman test, and Lagrange Multiplier test) were performed alongside classical assumption tests such as residual normality, multicollinearity, heteroscedasticity, and autocorrelation tests. Hypothesis testing included the t-test, F-test, and coefficient of determination (R^2). The results indicate that operating costs do not significantly affect liquidity, while cash flow and profitability do. Simultaneously, all three variables significantly influence the liquidity of transportation and logistics firms listed on the IDX during the observed period. Based on the analysis, it can be concluded that operating costs, cash flow, and profitability simultaneously influence the liquidity of companies in the transportation and logistics sector listed on the IDX during 2021–2023. Therefore, simultaneous increases or decreases in these variables will significantly affect liquidity levels. These three variables collectively explain 63.6% of the variation in liquidity, while the remaining 36.4% is influenced by other factors, such as inventory turnover, accounts receivable turnover, and Return on Equity (ROE).
Conclusion. Operating Costs measured by the Operating Expenses to Operating Income (BOPO) ratio do not significantly affect the liquidity of transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) during the 2021–2023 period. (2) Cash Flow measured by the Operating Cash Flow ratio has a positive effect on the liquidity of transportation and logistics companies listed on the IDX during the 2021–2023 period. (3) Profitability measured by the Return on Assets (ROA) ratio has a negative effect on the liquidity of transportation and logistics companies listed on the IDX during the 2021–2023 period. (4) Operating costs, cash flow, and profitability

collectively influence the liquidity of transportation and logistics companies listed on the IDX during the 2021–2023 period.

1. INTRODUCTION

Indonesia's economic growth is driven by various sectors, one of the most pivotal being the transportation and logistics sector, which plays a strategic role in enhancing national connectivity and supply chain efficiency. Maintaining sound financial performance in this sector requires a strong focus on liquidity, which is vital for sustaining operational continuity and meeting short-term obligations. Liquidity issues in transportation and logistics firms have fluctuated during the period 2021–2023, largely due to increasing fuel prices and toll fees. These external shocks have impacted firms' operational expenditures, cash flows, and profitability, thereby affecting their overall liquidity positions.

Operating costs refer to expenditures incurred by firms to support their day-to-day operations. The study employs the BOPO ratio (Operational Expenses to Operational Income) as an indicator of cost efficiency. A declining BOPO ratio generally signifies improved efficiency. Previous studies yield mixed results; Rufaidah et al. (2021) found a positive and significant relationship between BOPO and liquidity in Islamic banks, while Widyaningsih et al. (2024) reported a negative association. These conflicting findings necessitate further investigation in the context of transportation and logistics, which possesses different industry characteristics.

Cash flow, particularly from operations, is a vital component of liquidity as it represents the primary source of internal funds. However, escalating costs from fuel and tolls have intensified cash outflows, potentially disrupting liquidity. A healthy firm typically shows increasing operational cash flow, reflecting robust internal cash reserves. Sunardi et al. (2021) reported a positive and significant effect of operational cash flow on liquidity, while Khoirina and Rini (2022) found no significant effect in their study.

Profitability, often measured by Return on Assets (ROA), indicates a firm's ability to generate earnings from its assets. Ideally, increasing ROA suggests better financial performance. However, firms in the transportation and logistics sector have experienced ROA volatility, necessitating deeper analysis. While some studies (Br Sembiring & Wulandari, 2023) show no effect of ROA on bank liquidity, others (Santoso & Sukihanjani, 2013) suggest a significant positive impact.

This research offers a distinctive contribution by entering its analysis on the transportation and logistics sector, which has received relatively limited attention compared to the extensively studied sectors such as banking, manufacturing, and raw materials. A key innovation of this study lies in its consideration of fuel and toll expenses as explanatory variables, reflecting real-world financial pressures unique to the industry. Given the sector's pivotal role in supporting national connectivity and its vulnerability to cost fluctuations, the research provides relevant insights for enhancing corporate liquidity. By highlighting the interplay between cost efficiency, cash flow stability, and profitability, the study delivers actionable recommendations for firms to strengthen financial resilience and optimize internal resource management.

2. LITERATURE REVIEW

Agency Theory

Agency theory, initially introduced by Jensen and Meckling in 1976, describes a contractual relationship wherein a principal delegates authority to an agent to perform services and make decisions on behalf of the principal. In the corporate context, management acts as the agent responsible for operating the business and ensuring optimal resource utilization to align with the principal's interests. Effective strategies in managing operational costs, maintaining sufficient cash flow, and enhancing profitability are crucial to mitigate potential conflicts of interest and bolster the principal's confidence in management performance.

Liquidity

Liquidity refers to a firm's capacity to meet its short-term liabilities as they fall due. A liquid firm is one that possesses sufficient current assets to settle its current liabilities, while an illiquid firm lacks such capability (Fitriana, 2024). This study uses the current ratio as an indicator of liquidity, which compares current assets to current liabilities.

Operating Cost

Operating costs represent the expenses incurred in the course of daily business operations. In this study, the BOPO ratio (Operating Expenses to Operating Income) is used as an indicator. A declining BOPO ratio from year to year signifies improved cost efficiency, whereas an increasing ratio indicates inefficiencies (Artha et al., 2022). The BOPO ratio is calculated by dividing total operating expenses by operating income (Rufaidah et al., 2021).

Cash Flow

Cash, whether in hand or held in bank accounts, is the most liquid asset and appears first on a firm's balance sheet. This study employs operating cash flow as the primary indicator. According to Poli et al. (2019), The ability of a business to pay off its short-term debts with operating cash flow is gauged by the operating cash flow ratio. Operating cash flow is divided by current liabilities to calculate the ratio.

Profitability

Profitability gauges a firm's financial performance, reflecting its capacity to generate earnings from its sales, assets, and equity over a specific period. This study utilizes the Return on Assets (ROA) ratio, where a higher ROA denotes stronger profitability. Conversely, a lower ROA indicates a reduced ability to convert assets into net income. ROA is calculated by dividing net income by total assets (Thian, 2022).

3. METHODS

This study adopts a quantitative associative approach with a causal relationship framework, following the methodology outlined by Sugiyono (2022). The primary objective is to examine the causal relationships between operating costs, cash flows, and profitability on corporate liquidity. The population of the study comprises all transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) during the period 2021–2023.

The sample was selected using purposive sampling based on specific criteria: (1) companies classified under the land transportation and logistics sector; (2) companies with audited financial statements available for the years 2021, 2022, and 2023; and (3) companies experiencing an increase in short-term liabilities during the observation period. Based on these criteria, six companies were selected as the research sample.

The data used are secondary data derived from the companies' audited financial reports, collected through documentation techniques. All financial data were processed and analyzed quantitatively.

EViews 12 software was used to perform panel data regression and descriptive statistical analysis. Three model selection tests were employed: the Chow test (to compare fixed effects and common effects), the Hausman test (to compare random and fixed effects), and the Lagrange Multiplier test (to compare common and random effects).

To validate the regression model, classical assumption tests were conducted, including residual normality, multicollinearity, heteroscedasticity, and autocorrelation tests. Hypothesis testing was conducted using the t-test (to evaluate individual variable significance), F-test (to assess simultaneous effects), and the coefficient of determination (R^2) to measure the explanatory power of the independent variables on liquidity.

4. RESULTS AND DISCUSSION

Sample Selection Results

Based on the predetermined sampling criteria, six transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) qualified as the study sample:

NO	CODE	Company Name	Short-Term Liability		
			2021	2022	2023
1	BPTR	Batavia Prosperindo Trans Tbk	15.5%	23.3%	30.5%
2	JAYA	Armada Berjaya Trans Tbk	8.7%	14.6%	38.9%
3	KJEN	Krida Jaringan Nusantara Tbk	17.7%	21.5%	21.5%
4	SAPX	Satria Antaran Prima Tbk	17.2%	19.0%	38.7%
5	TRJA	Transkon Jaya Tbk.	13.4%	20.9%	33.2%
6	WEHA	WEHA Transportasi Indonesia Tbk.	17.9%	18.0%	21.5%

Figure 1. Sample Selection Results
Source: Processed by researchers (2025)

Descriptive Statistics Result

	Y - Likuiditas	X1 - BOPO	X2 - Arus Kas	X3 - ROA
Mean	0.998053	0.388315	0.701516	0.032601
Median	0.577847	0.261224	0.633531	0.016174
Maximum	3.123462	0.792864	2.757607	0.178453
Minimum	0.127217	0.090870	-0.436577	-0.043253
Std. Dev.	0.907376	0.260486	0.838304	0.050224
Skewness	1.127396	0.547571	0.849331	1.259161
Kurtosis	2.977224	1.575447	3.346955	5.068824

Figure 2. Descriptive Statistics Result

Source: Processed by researchers (2025)

The liquidity variable (Y) had an average value of 0.998053. The minimum value of 0.127217 was recorded by PT Armada Berjaya Trans Tbk., while the maximum value of 3.123462 was recorded by PT Batavia Prosperindo Trans Tbk. The operating cost variable (X1) had an average value of 0.388315. The minimum value of 0.090870 was recorded by PT Batavia Prosperindo Trans Tbk., while the maximum value of 0.792864 was recorded by PT Krida Jaringan Nusantara Tbk. The cash flow variable (X2) had an average value of 0.701516. The minimum value of -0.436577 was recorded by PT Armada Berjaya Trans Tbk., while the maximum value of 2.757607 was recorded by PT Batavia Prosperindo Trans Tbk. The profitability variable (X3) had an average value of 0.032601. The minimum value of -0.043253 was recorded by PT WEHA Transportasi Indonesia Tbk., while the maximum value of 0.178453 was recorded by PT Satria Antaran Prima Tbk.

Model Selection Test Results

Panel data regression is the methodology employed in this investigation. According to the decision rule, the null hypothesis (H0) is accepted if the probability value is greater than 0.05 and rejected if the probability value is less than 0.05.

Chow Test (Fixed Effect vs Common Effect)

Hypotheses: H0 = Common Effect Model, H1 = Fixed Effect Model

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.698883	(5,9)	0.0427
Cross-section Chi-square	20.101649	5	0.0012

Figure 3. Chow Test
Source: Processed by researchers (2025)

The Chow test using EViews 12 yielded a probability value for the cross-section F of 0.0427. Based on this result, the most appropriate and selected model for panel data regression is the Fixed Effect Model (FEM).

Hausman Test (Random Effect vs Fixed Effect)

Hypotheses: H0 = Random Effect Model, H1 = Fixed Effect Model

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.604896	3	0.0856

Figure 4. Hausman Test
Source: Processed by researchers (2025)

The Hausman test conducted using EViews 12 produced a probability value of 0.0856. According to the decision criteria, the most suitable model based on the Hausman test is the Random Effect Model (REM).

Lagrange Multiplier Test (Common Effect vs Random Effect)

Hypotheses: H0 = Common Effect Model, H1 = Random Effect Model

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	0.357402	0.002364	0.359766
	(0.5500)	(0.9612)	(0.5486)

Figure 5. Lagrange Multiplier Test
Source: Processed by researchers (2025)

The Lagrange Multiplier test using EViews 12 yielded a probability value of 0.5500. Hence, the most appropriate model for panel data regression in this study is the Common Effect Model (CEM), as confirmed by the final test outcome.

Classical Assumption Test Results

Normality Test of Residuals

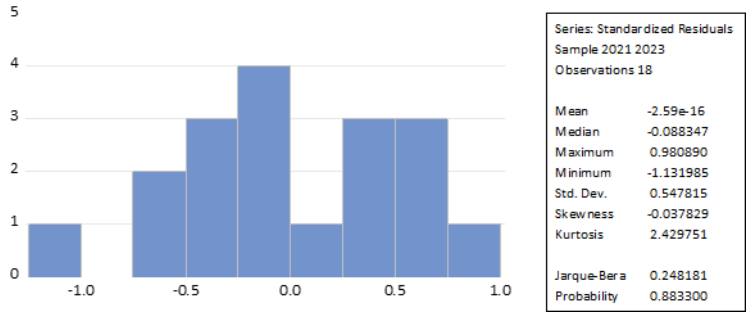

Figure 6. Normality Test
Source: Processed by researchers (2025)

Based on the figure above, the Jarque-Bera statistic is 0.248181 with a probability value of 0.883300. Since the p-value exceeds 0.05, the data is normally distributed.

Multicollinearity Test

	X1	X2	X3
X1	1.000000	-0.569598	-0.170213
X2	-0.569598	1.000000	0.247199
X3	-0.170213	0.247199	1.000000

Figure 7. Multicollinearity Test
Source: Processed by researchers (2025)

Based on the table above, there is no multicollinearity among the independent variables, as none of the correlation coefficients exceed 0.8.

Autocorrelation Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.223966	0.405516	3.018291	0.0092
X1	-0.912754	0.684306	-1.333838	0.2036
X2	0.615138	0.216242	2.844670	0.0130
X3	-9.294419	3.010580	-3.087252	0.0080

R-squared	0.635504	Mean dependent var	0.998053
Adjusted R-squared	0.557398	S.D. dependent var	0.907376
S.E. of regression	0.603662	Akaike info criterion	2.021527
Sum squared resid	5.101717	Schwarz criterion	2.219387
Log likelihood	-14.19374	Hannan-Quinn criter.	2.048809
F-statistic	8.136394	Durbin-Watson stat	1.107931
Prob(F-statistic)	0.002216		

Figure 8. Autocorrelation Test
Source: Processed by researchers (2025)

The table above shows a Durbin-Watson value of 1.107931. This indicates that no autocorrelation is present since the value lies between -2 and 2.

Heteroscedasticity Test

Test Equation:
Dependent Variable: ARESID
Method: Least Squares
Date: 04/29/25 Time: 23:14
Sample: 1 18
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.178522	0.078377	2.277744	0.0390
X1	-0.073785	0.132260	-0.557876	0.5857
X3	-0.580466	0.581875	-0.997580	0.3354
X2	0.066833	0.041795	1.599087	0.1321

Figure 9. Heteroscedasticity Test
Source: Processed by researchers (2025)

The table above shows that the probability values for the BOPO ratio (X1) is 0.5857, for operating cash flow ratio (X2) is 0.1321, and for ROA ratio (X3) is 0.3354. As all p-values are greater than 0.05, this indicates that heteroscedasticity is not present in the model.

Hypothesis Testing
Partial Test (t-Test)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.223966	0.405516	3.018291	0.0092
X1	-0.912754	0.684306	-1.333838	0.2036
X2	0.615138	0.216242	2.844670	0.0130
X3	-9.294419	3.010580	-3.087252	0.0080

Figure 9. Partial Test (t-Test)
Source: Processed by researchers (2025)

The result of the partial test or t-test for the BOPO variable (X1) on liquidity (Y) shows a t-statistic value of -1.333838 with a probability value of 0.2036, indicating that the BOPO variable (X1) does not significantly influence the liquidity variable (Y). The result of the partial test for the Operating Cash Flow variable (X2) on liquidity (Y) shows a t-statistic value of 2.844670 with a probability value of 0.0130, indicating that the Operating Cash Flow variable (X2) significantly influences the liquidity variable (Y). The result of the partial test for the ROA variable (X3) on liquidity (Y) shows a t-statistic value of -3.087252, indicating that the ROA variable (X3) significantly influences the liquidity variable (Y).

Simultaneous Test (F-Test)

R-squared	0.635504	Mean dependent var	0.998053
Adjusted R-squared	0.557398	S.D. dependent var	0.907376
S.E. of regression	0.603662	Akaike info criterion	2.021527
Sum squared resid	5.101717	Schwarz criterion	2.219387
Log likelihood	-14.19374	Hannan-Quinn criter.	2.048809
F-statistic	8.136394	Durbin-Watson stat	1.107931
Prob(F-statistic)	0.002216		

Figure 9. Simultaneous Test (F-Test)
Source: Processed by researchers (2025)

Based on the table above, the result of the simultaneous or F-test shows an F-statistic value of 8.136394 with a probability value of 0.002216, indicating that the independent variables BOPO (X1), Operating Cash Flow (X2), and ROA (X3) simultaneously have a significant effect on the dependent variable Liquidity (Y).

Coefficient of Determination Test

Based on the panel data regression results, the R-squared value is 0.635504 or 63.6%. This means that the variation in the liquidity variable (Y) is explained by the BOPO (X1), Operating Cash Flow (X2), and ROA (X3) variables by 63.6%, while the remaining 36.4% is influenced by other variables not included in this study.

DISCUSSION

The Effect of Operating Costs on Company Liquidity

This study reveals that the Operating Expenses to Operating Income (BOPO) ratio variable does not affect the liquidity of companies in the transportation and logistics sector. In other words, fluctuations in the BOPO ratio—whether increases or decreases—do not significantly influence the liquidity level of companies within this sector. This outcome is likely due to high operating expenses being offset by equally high revenue, thereby minimizing their direct impact on liquidity. Firms with low BOPO ratios typically yield higher profits after accounting for operating costs, allowing them to maintain liquidity if such profits are retained as cash reserves. On the other hand, companies with high BOPO ratios can also sustain healthy liquidity levels, provided they maintain substantial cash reserves.

The Effect of Cash Flow on Company Liquidity

The operating cash flow ratio variable in this study significantly affects the liquidity of companies in the logistics and transportation industry. This implies that during the 2021–2023 period, any changes in the operating cash flow ratio impacted the liquidity of transportation and logistics companies listed on the Indonesia Stock Exchange (IDX). The positive coefficient direction indicates that a rise in operating cash flow is followed by an increase in company liquidity. As a primary funding source, operational cash flow directly contributes to a company's ability to meet obligations and ensure financial

stability. Therefore, inadequate operating cash flow results in reduced liquidity, while improving operational cash inflow enhances it.

The Effect of Profitability on Company Liquidity

This study demonstrates that Return on Assets (ROA) significantly affects the liquidity of companies in the transportation and logistics sector. This indicates that changes in ROA—whether increases or decreases—affect the liquidity level of companies listed on the IDX between 2021 and 2023. The negative coefficient direction suggests an inverse relationship: an increase in ROA tends to reduce liquidity, and vice versa. This inverse effect may occur because firms in this sector often prioritize fixed asset investments, such as purchasing new fleets. While these investments increase total assets and may enhance profitability, they simultaneously reduce available cash, thus lowering liquidity. Conversely, a decrease in ROA may enhance liquidity if firms delay excessive investment plans. The funds previously allocated for investment remain within the company as cash reserves, thereby improving liquidity despite a decline in ROA.

The Simultaneous Effect of Operating Costs, Cash Flow, and Profitability on Liquidity

Based on the analysis, it can be concluded that operating costs, cash flow, and profitability simultaneously influence the liquidity of companies in the transportation and logistics sector listed on the IDX during 2021–2023. Therefore, simultaneous increases or decreases in these variables will significantly affect liquidity levels. These three variables collectively explain 63.6% of the variation in liquidity, while the remaining 36.4% is influenced by other factors, such as inventory turnover, accounts receivable turnover, and Return on Equity (ROE).

5. CONCLUSION

Based on the conducted research, the following conclusions can be drawn: (1) Operating Costs measured by the Operating Expenses to Operating Income (BOPO) ratio do not significantly affect the liquidity of transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) during the 2021–2023 period. (2) Cash Flow measured by the Operating Cash Flow ratio has a positive effect on the liquidity of transportation and logistics companies listed on the IDX during the 2021–2023 period. (3) Profitability measured by the Return on Assets (ROA) ratio has a negative effect on the liquidity of transportation and logistics companies listed on the IDX during the 2021–2023 period. (4) Operating costs, cash flow, and profitability collectively influence the liquidity of transportation and logistics companies listed on the IDX during the 2021–2023 period.

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