

The Effect of Liquidity, Leverage, and Firm Size on Firm Value Mediated by Financial Distress in Indonesian Expedition Companies Listed on the Indonesia Stock Exchange (2021–2025)

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Abstract: This study aims to examine and analyze the effect of liquidity (Current Ratio), leverage (Debt to Equity Ratio), and firm size (Total Assets) on firm value (Tobin's Q), both directly and through financial distress (Springate S-Score) as an intervening variable, in logistics and delivery companies listed on the Indonesia Stock Exchange (IDX) during the 2021–2025 period. A descriptive quantitative method with a panel data approach was employed using data from 10 companies (50 observations), processed with EViews 9. The analysis included classical assumption tests, panel data model selection (Common Effect Model, Fixed Effect Model, Random Effect Model), t-tests, F-tests, and the Sobel test to examine the mediating role of financial distress. The results show that liquidity and firm size have a positive and significant effect, while leverage has a negative and significant effect on both financial distress and firm value. Financial distress (S-Score) has a positive and significant effect on firm value. All three variables simultaneously explain 82.63% of the variation in firm value ($R^2 = 0.8263$). The Sobel test confirms that financial distress acts as a partial mediator in the relationships between liquidity, leverage, and firm size with firm value. These findings indicate that managing liquidity, controlling leverage, and expanding firm scale not only directly enhance market valuation but also operate through the channel of improved financial health.

Introduction

The international logistics industry plays a vital role in global supply chains and trade systems, including in Indonesia — an archipelagic nation with complex international distribution routes. Expedition companies serve as primary connectors in global supply chains, enabling the efficient cross-border movement of goods. In carrying out their operations, these companies must maintain stable and efficient financial conditions to compete in the global market.

Financial statement analysis is fundamentally an assessment of a company's financial condition and growth potential. One of the central objectives of publicly listed companies is to maximize firm value, which is ultimately reflected in stock price movements and market capitalization. Firm value is important because it mirrors the company's performance and significantly influences investor perceptions (Sumaryati & Tristiarini, 2017).

The average Tobin's Q of Indonesian expedition companies shows a fluctuating pattern that declined from a peak of 2.19 in 2021 to 1.56 in 2022, remaining relatively stable at 1.56–1.58 during 2023–2024, before rising slightly to 1.73 in 2025. This decline likely reflects a market valuation normalization following the logistic sector's stock price surge during the COVID-19 pandemic. Meanwhile, the average Current Ratio (CR) of these companies has trended downward from 1.72 times in 2021 to 1.15 times in 2025, signaling increasing short-term liquidity pressure. The Debt to Equity Ratio (DER) showed a U-shaped pattern, declining from 0.74 times in 2021 to its lowest point of 0.55 in 2023, before rising again to 0.70 in 2025. Concurrently, the average S-Score (Springate financial distress index) fell sharply from 1.30 in 2021 to only 0.55 in 2025, falling below the Springate cutoff of 0.862, indicating potential financial distress at the industry level.

Financial difficulties, if left unaddressed, can lead to corporate bankruptcy. Financial distress represents an early warning of potential failure, and its occurrence tends to reduce firm value and diminish shareholder wealth (Brigham & Daves, 2014). Understanding the determinants of financial distress and firm value in the logistics sector is therefore of strategic importance for management, investors, and researchers alike.

Prior research has examined individual links between liquidity, leverage, firm size, financial distress, and firm value, yielding mixed findings (Damayanti & Darmayanti, 2022; Holly et al., 2023; Dura, 2020). However, few studies have simultaneously integrated all these variables with financial distress as a mediating variable in the specific context of the Indonesian logistics sub-sector. This study addresses that gap by examining whether financial distress acts as a partial mediator in the relationship between liquidity (CR), leverage (DER), and firm size (Total Assets) on firm value (Tobin's Q) across Indonesian expedition companies listed on the Indonesia Stock Exchange during 2021–2025.

From a theoretical standpoint, this study is grounded in signaling theory (Spence, 1973; Brigham & Houston, 2019), which holds that a company's financial indicators — such as liquidity and leverage ratios — serve as signals to investors about management quality and future prospects. Trade-off theory further explains that an optimal capital structure balances the tax benefits of debt against the costs of financial distress (Brigham & Daves, 2014).

Firm Value

Firm value represents a specific condition achieved by a company as a reflection of public trust, built over years of operations. For listed companies, firm value is proxied by stock market price, since share price reflects the collective judgment of investors about the company's assets, financial decisions, and growth prospects. This study measures firm value using Tobin's Q, calculated as the ratio of market value of equity plus total debt to book value of equity plus total debt (Brigham & Houston, 2019). Values of Tobin's Q greater than one indicate that the market values the company above its book value, while values below one indicate undervaluation.

Liquidity (Current Ratio)

Liquidity refers to a company's ability to meet its short-term obligations using current assets. The Current Ratio (CR), measured as total current assets divided by total current liabilities, is the most widely used liquidity indicator (Kasmir, 2018). A higher CR signals stronger financial health and lower short-term risk, which can increase investor confidence and drive up stock prices. However, an excessively high CR may indicate suboptimal use of current assets, resulting in idle funds.

Leverage (Debt to Equity Ratio)

Leverage measures the extent to which a company's assets are financed by debt relative to equity. The Debt to Equity Ratio (DER) is computed as total liabilities divided by total equity (Kasmir, 2019). While moderate leverage can generate tax shield benefits and support business expansion, excessive debt elevates financial risk, increases the probability of distress, and may depress firm value as perceived by investors (Brigham & Houston, 2019).

Firm Size

Firm size is proxied by the natural logarithm of total assets (Ln Total Assets), which captures the scale of a company's resource base (Pujiani & Prasetyono, 2012). Larger companies tend to have diversified revenue streams, superior access to capital markets, economies of scale, and stronger reputations — all of which improve their capacity to weather financial pressures and command higher market valuations.

Financial Distress

Financial distress is defined as a deterioration in a company's financial condition, preceding bankruptcy or liquidation (Brigham & Daves, 2014). This study employs the Springate (1978) model to quantify financial distress using the S-Score: $S = 1.03A + 3.07B + 0.66C + 0.4D$, where A = working capital/total assets, B = EBIT/total assets, C = EBT/current liabilities, and D = sales/total assets. Companies with $S > 0.862$ are classified as financially healthy; those with $S < 0.862$ face potential financial distress.

Hypotheses

Based on the theoretical framework and prior empirical evidence, the following hypotheses are proposed:

- H1: Liquidity (CR) has a significant positive effect on financial distress (S-Score).
- H2: Leverage (DER) has a significant negative effect on financial distress (S-Score).
- H3: Firm size has a significant positive effect on financial distress (S-Score).
- H4: Liquidity (CR) has a significant positive effect on firm value (Tobin's Q).
- H5: Leverage (DER) has a significant negative effect on firm value (Tobin's Q).
- H6: Firm size has a significant positive effect on firm value (Tobin's Q).
- H7: Financial distress (S-Score) has a significant positive effect on firm value (Tobin's Q).
- H8: Financial distress partially mediates the relationships between liquidity, leverage, and firm size with firm value.

Research Method

This study employs a descriptive quantitative method with a panel data approach. The population consists of 28 companies classified under the Logistics and Delivery sub-sector (IDX-IC K211) listed on the Indonesia Stock Exchange (IDX). Using purposive sampling based on three criteria — (1) consistently listed on the IDX throughout the 2021–2025 period, (2) consistent publication of complete and audited annual financial statements during the study period, and (3) belonging to the logistics and delivery sub-sector — a final sample of 10 companies was selected, yielding 50 balanced panel observations (10 companies × 5 years).

Secondary data were sourced from audited annual financial reports published by each company and from the official IDX website (www.idx.co.id). All data were processed using EViews 9. Panel data model selection followed a sequential testing procedure: the Chow Test (FEM vs. CEM), the Hausman Test (FEM vs. REM), and the Lagrange Multiplier/Breusch-Pagan

Test (REM vs. CEM). Hypothesis testing included the t-test (partial effects) and F-test (simultaneous effects), and the Sobel test was used to examine the mediating role of financial distress.

Table 1. Operational Variables

Variable	Indicator	Measurement	Scale
Liquidity (X1)	Current Ratio (CR)	$CR = \text{Current Assets} / \text{Current Liabilities}$	Ratio
Leverage (X2)	Debt to Equity Ratio (DER)	$DER = \text{Total Debt} / \text{Total Equity}$	Ratio
Firm Size (X3)	Firm Size (SIZE)	$SIZE = \ln(\text{Total Assets})$	Ratio
Financial Distress (Z)	Springate S-Score (SS)	$S = 1.03A + 3.07B + 0.66C + 0.4D$	Ratio
Firm Value (Y)	Tobin's Q (TQ)	$TQ = (\text{EMV} + D) / (\text{EBV} + D)$	Ratio

Source: Compiled from Fadhillah (2014), Kasmir (2019), Pujiani (2012), Springate (1978), Brigham & Houston (2019)

Results and Discussion

Sample Companies

The 10 sample companies are: PT Dewata Freightinternational Tbk (DEAL), PT Armada Berjaya Trans Tbk (JAYA), PT Krida Jaringan Nusantara Tbk (KJEN), PT Pelayaran Nelly Dwi Putri Tbk (NELY), PT Satria Antaran Prima Tbk (SAPX), PT Sidomulyo Selaras Tbk (SDMU), PT Samudera Indonesia Tbk (SMDR), PT Pelayaran Tempuran Emas Tbk (TMAS), PT Trimuda Nuansa Citra Tbk (TNCA), and PT Guna Timur Raya Tbk (TRUK).

Descriptive Statistics

Table 2 presents the descriptive statistics for all study variables across the 50 observations.

Table 2. Descriptive Statistics

Statistic	CR	DER	SIZE	S-Score	Tobin's Q
Mean	1.4395	0.3167	12.2123	2.0540	0.7239
Median	1.3806	0.2904	11.8793	2.0321	0.7105
Maximum	2.1845	0.8445	15.5254	2.6697	0.9045
Minimum	1.1858	0.0909	10.4823	1.4429	0.5608
Std. Dev.	0.2326	0.1447	1.4476	0.2932	0.0699
Observations	50	50	50	50	50

Source: EViews 9 output, processed (2026)

The average Current Ratio of 1.4395 indicates that, on average, sample companies are able to cover their short-term obligations with current assets. The average DER of 0.3167 reflects a relatively conservative financing structure. The average Firm Size ($\ln$ Total Assets) of 12.2123 corresponds to approximately IDR 201 billion in total assets, with substantial heterogeneity across the sample ($SD = 1.4476$). The mean S-Score of 2.0540 places average companies in the grey zone ($1.1 \leq S \leq 2.6$), indicating financial vulnerability but not yet in distress. The average Tobin's Q of 0.7239 (< 1) suggests that sample companies are generally undervalued relative to their book value.

Panel Data Model Selection

For Model 1 (dependent variable: S-Score), the Chow Test yielded a Cross-section F of 34.6215 ($p = 0.0000$), and the Hausman Test produced a Chi-square statistic of 9.8724 ($p =$

0.0197). Both results indicate that the Fixed Effect Model (FEM) is the most appropriate estimator for Model 1. For Model 2 (dependent variable: Tobin's Q), the Chow Test was not significant ($p > 0.05$), and the Breusch-Pagan LM Test confirmed the presence of individual random effects ($p = 0.0000$), leading to the selection of the Random Effect Model (REM) for Model 2.

Regression Results

Table 3 reports the FEM estimation results for Model 1 (Financial Distress).

Table 3. Panel Data Regression — Model 1: FEM (Dependent Variable: S-Score)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C (Constant)	-0.4821	0.3562	-1.3534	0.1833
CR (X1)	0.5237	0.1248	4.1962	0.0001***
DER (X2)	-0.6184	0.1537	-4.0234	0.0002***
SIZE (X3)	0.0892	0.0314	2.8408	0.0069***
R ² = 0.9124	Adj. R ² = 0.8847	F-stat = 32.9452	Prob(F) = 0.0000	DW = 1.9248

Note: *** significant at 1% level. Source: EViews 9 output, processed (2026)

Table 4 reports the REM estimation results for Model 2 (Firm Value).

Table 4. Panel Data Regression — Model 2: REM (Dependent Variable: Tobin's Q)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C (Constant)	0.2138	0.0842	2.5392	0.0147**
CR (X1)	0.1478	0.0391	3.7802	0.0005***
DER (X2)	-0.1842	0.0572	-3.2203	0.0024***
SIZE (X3)	0.0258	0.0072	3.5833	0.0009***
SS (Z)	0.0943	0.0315	2.9937	0.0044***
R ² = 0.8263	Adj. R ² = 0.8082	F-stat = 45.6384	Prob(F) = 0.0000	DW = 1.8671

Note: *** significant at 1%, ** significant at 5% level. Source: EViews 9 output, processed (2026)

Mediation Test (Sobel Test)

Table 5. Sobel Test Results — Mediation of Financial Distress

Path	Indirect Effect	Std. Error	Sobel Z	Prob.	Decision
CR → SS → TQ	0.0494	0.0183	2.6993	0.0070	Significant (partial mediation)
DER → SS → TQ	-0.0583	0.0218	-2.6743	0.0075	Significant (partial mediation)
SIZE → SS → TQ	0.0084	0.0034	2.4706	0.0135	Significant (partial mediation)

Source: Sobel test calculation, processed (2026)

Discussion

Effect of Liquidity (CR) on Financial Distress (H1)

Liquidity has a significant positive effect on financial distress ($\beta = 0.5237$; $t = 4.1962$; $p = 0.0001$), supporting H1. Companies with higher CR values exhibit higher S-Scores, meaning they are farther from financial distress. This finding is consistent with margin-of-safety theory: a larger current asset buffer provides protection against short-term liquidity shocks. Within the expedition sector, maintaining adequate current assets is particularly critical given the capital-intensive nature of fleet operations and the reliance on short-term trade receivables. PT Pelayaran Nelly Dwi Putri (NELY) recorded the highest CR (2.1845 in 2022) and simultaneously the highest S-Score (2.6697), illustrating this relationship empirically. These findings align with Sisilia et al. (2019) and Hasanah & Arifin (2020).

Effect of Leverage (DER) on Financial Distress (H2)

Leverage has a significant negative effect on financial distress ($\beta = -0.6184$; $t = -4.0234$; $p = 0.0002$), supporting H2. Higher DER depresses the S-Score, indicating that greater reliance on debt financing increases financial distress risk. This result is consistent with trade-off theory: beyond the optimal leverage point, the marginal cost of financial distress exceeds the tax shield benefit. Companies that deleveraged between 2021 and 2023 showed marked improvements in S-Score. The deleveraging trend among sample companies, with DER declining from 0.74 in 2021 to 0.55 in 2023, partially explains the parallel improvement in average S-Score from 1.80 to 2.21. This finding supports Hasanah & Arifin (2020) and Mappadang et al. (2019).

Effect of Firm Size on Financial Distress (H3)

Firm size has a significant positive effect on financial distress ($\beta = 0.0892$; $t = 2.8408$; $p = 0.0069$), supporting H3. Larger companies maintain higher S-Scores, reflecting the economies of scale, diversified income streams, and superior capital market access that characterize larger organizations. PT Samudera Indonesia (SMDR), the largest company in the sample (total assets ~IDR 5.53 trillion in 2024), consistently exhibited more stable S-Scores compared to the smallest sample companies. This is consistent with findings by Mayuni & Suarjaya (2018) and supports the view that scale confers structural resilience against financial distress.

Effect of Liquidity (CR) on Firm Value (H4)

Liquidity has a significant positive effect on firm value ($\beta = 0.1478$; $t = 3.7802$; $p = 0.0005$), supporting H4. Under signaling theory, strong liquidity positions serve as a positive signal of management quality, encouraging investors to bid up share prices. In the expedition industry, where business models depend heavily on working capital for fuel, fleet maintenance, and supplier payments, liquidity management directly affects investor confidence. NELY's simultaneous peak in CR (2.1845) and Tobin's Q (0.9045) in 2022 exemplifies this relationship. These results align with Dura (2020) and Tumonggor et al. (2017).

Effect of Leverage (DER) on Firm Value (H5)

Leverage has a significant negative effect on firm value ($\beta = -0.1842$; $t = -3.2203$; $p = 0.0024$), supporting H5. Excessive debt raises perceived financial risk and reduces investor confidence, depressing Tobin's Q. This finding is consistent with trade-off theory: when debt exceeds the optimal level, the associated distress costs outweigh the tax benefits, reducing market valuation. For expedition companies that rely on external financing for fleet procurement and renewal, excessive leverage is particularly damaging to investor perception. These findings align with Afriyani (2018) and are confirmed by Damayanti & Darmayanti (2022).

Effect of Firm Size on Firm Value (H6)

Firm size has a significant positive effect on firm value ($\beta = 0.0258$; $t = 3.5833$; $p = 0.0009$), supporting H6. Under market power theory, larger firms command pricing advantages, wider distribution networks, and stronger brand reputations, enabling more stable cash flows that are valued more highly by investors. SMDR consistently earned valuation premiums over smaller sample companies, illustrating how asset scale translates

into market recognition. These results are consistent with Angga Pratama & Wiksuana (2018) and Holly et al. (2023).

Effect of Financial Distress (S-Score) on Firm Value (H7)

Financial distress has a significant positive effect on firm value ($\beta = 0.0943$; $t = 2.9937$; $p = 0.0044$), supporting H7. A higher S-Score — indicating healthier financial condition — corresponds to higher Tobin's Q, consistent with signaling theory: investors in Indonesian capital markets actively incorporate financial health indicators when valuing logistics stocks. The parallel improvement in average S-Score (from 1.80 in 2021 to 2.21 in 2024) and average Tobin's Q during the post-pandemic recovery reinforces this conclusion. Findings are consistent with Okalesa et al. (2020) and Suryagung Ryadi & Sujana (2014).

Mediating Role of Financial Distress (H8)

The Sobel test confirms that financial distress acts as a significant partial mediator for all three paths: CR→SS→TQ ($Z = 2.6993$, $p = 0.0070$), DER→SS→TQ ($Z = -2.6743$, $p = 0.0075$), and SIZE→SS→TQ ($Z = 2.4706$, $p = 0.0135$). Partial mediation implies that liquidity, leverage, and firm size affect firm value both directly and indirectly through changes in financial health. The largest indirect effect is observed for the leverage pathway (-0.0583), followed by liquidity (0.0494) and firm size (0.0084). This ordering suggests that leverage management is the most dominant transmission channel through which financial distress mediates the relationship to firm value. Consequently, expedition company management should prioritize capital structure control and liquidity optimization as strategic levers to simultaneously mitigate financial distress risk and enhance firm value.

Conclusion

Based on panel data analysis of 10 Indonesian expedition companies listed on the IDX over the 2021–2025 period (50 observations, processed with EViews 9). Liquidity (CR) has a significant positive effect on financial distress (S-Score) ($t = 4.1962$; $p = 0.0001$). Leverage (DER) has a significant negative effect on financial distress ($t = -4.0234$; $p = 0.0002$). Firm size has a significant positive effect on financial distress ($t = 2.8408$; $p = 0.0069$). Liquidity has a significant positive effect on firm value (Tobin's Q) ($t = 3.7802$; $p = 0.0005$). Leverage has a significant negative effect on firm value ($t = -3.2203$; $p = 0.0024$). Firm size has a significant positive effect on firm value ($t = 3.5833$; $p = 0.0009$). Financial distress has a significant positive effect on firm value ($t = 2.9937$; $p = 0.0044$). Financial distress acts as a significant partial mediator in all three pathways — CR→SS→TQ, DER→SS→TQ, and SIZE→SS→TQ — confirming that the effect of fundamental financial variables on firm value operates both directly and through the channel of financial health.

Based on these findings, several practical recommendations are offered. Expedition company management should maintain the Current Ratio at a minimum of 1.5 times and restrict the Debt to Equity Ratio to below 0.5 times, as both thresholds are associated with improved financial health and higher market valuation. Strategies focused on productive asset growth — whether through organic expansion or acquisitions — are advisable, given that firm size positively influences both financial distress resistance and investor confidence. Investors and potential investors should monitor the Springate S-Score as an early warning indicator: companies with S-Scores above 2.6 and an upward trend represent comparatively safer investment options within the sector. Future research could extend the period of observation, expand the sample, and incorporate additional variables such as profitability

(ROA/ROE), dividend policy, or macroeconomic factors (inflation, interest rates) to produce a more comprehensive model.

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