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## The Effect of VAT Increase, Firm Size, and Leverage on Financial Performance with EBITDA Margin as a Mediating Variable in Logistics and Deliveries Subsector Companies

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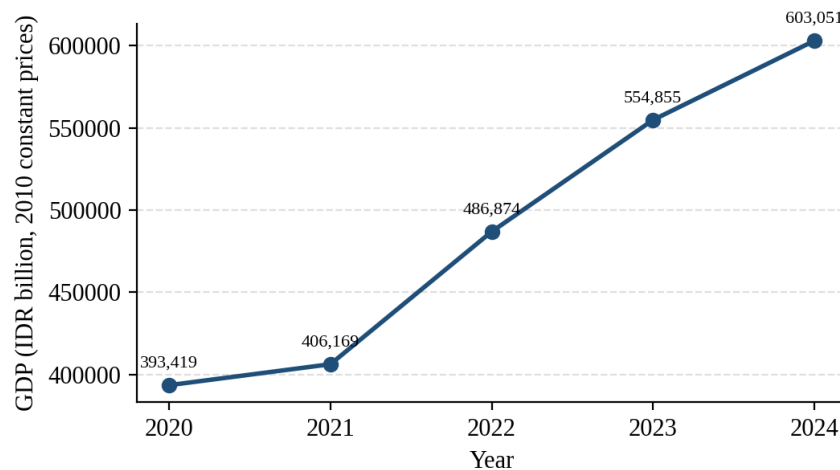
**Abstract:** This study examines the effect of the value-added tax (VAT) rate increase, firm size, and leverage on financial performance, with EBITDA margin as a mediating variable, in logistics and deliveries subsector companies listed on the Indonesia Stock Exchange during 2020–2024. The VAT increase is measured as a policy dummy variable, firm size as the natural logarithm of total assets, leverage as the debt to equity ratio, and financial performance as return on assets. Secondary data from 20 purposively sampled companies, comprising 98 firm year observations, were analyzed using panel data regression and the Sobel mediation test with Eviews. The results show that firm size has a significant positive effect on EBITDA margin, while the VAT increase and leverage have no significant effect. Leverage has a significant negative effect on financial performance, whereas the VAT increase and firm size have no significant effect. EBITDA margin has a significant positive effect on financial performance and significantly mediates the effect of firm size, but does not mediate the effects of the VAT increase or leverage. These findings indicate that capital structure decisions influence financial performance more than the VAT policy change, with operational efficiency as the primary channel linking firm size to performance.

**Keyword:** VAT Increase, Firm Size, Leverage, EBITDA Margin, Financial Performance

### INTRODUCTION

As an archipelagic country with a vast and geographically diverse territory, Indonesia depends heavily on an efficient logistics system to sustain national economic activity. Efficient commodity distribution supports both domestic trade and export-import operations, given Indonesia's strategic position in global supply chains. The logistics industry, particularly the transportation, warehousing, and distribution support services sectors, makes a substantial contribution to national economic growth. Statistics Indonesia (Badan Pusat Statistik [BPS], 2025) reported that the gross domestic product (GDP) of the postal, courier, warehousing, and

transportation support services sector increased between 2020 and 2024, as illustrated in Figure 1.



Source: Badan Pusat Statistik, 2025 (data reprocessed by the author)

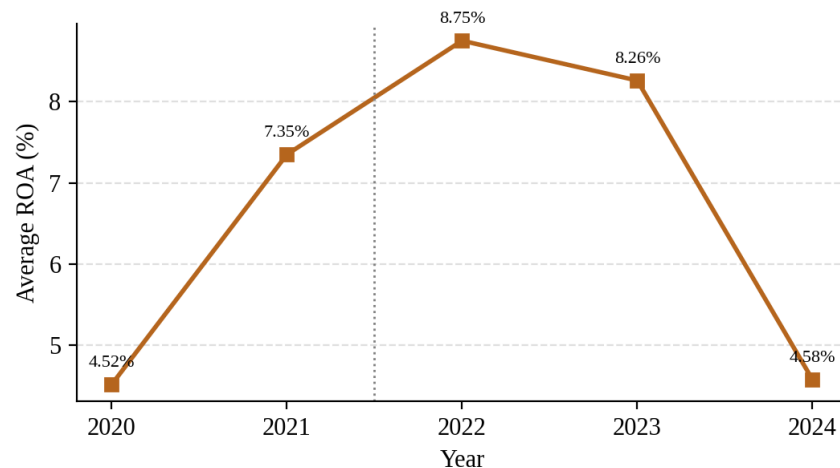
**Figure 1. GDP of the Transportation and Warehousing Business Sector, 2020–2024**

Despite this growth, national logistics costs remain high, estimated at 23.08% of GDP in 2022, of which export-related logistics costs accounted for 8.98% of GDP and domestic logistics costs for 14.1% of GDP; land-based logistics alone made up more than half of domestic logistics spending, equivalent to about 7% of GDP (ANTARA News, 2024). The COVID-19 pandemic (2019–2020) further pressured the sector: logistics-sector growth in the first quarter of 2020 slowed to 1.27% year-on-year, sharply down from 5.45% in the same period a year earlier, driven by supply-chain disruptions, weaker export-import demand, and restrictions on industrial and trade activity (ANTARA News, 2020).

To support post-pandemic economic recovery, the Government of Indonesia enacted Law No. 7 of 2022 on the Harmonization of Tax Regulations (UU HPP), intended to raise state revenue, strengthen the national tax base, and provide fiscal incentives. One of its most significant provisions raised the Value Added Tax (VAT) rate from 10% to 11%, effective 1 April 2022, as part of an effort to balance fiscal needs with the ongoing economic recovery. VAT is a multi-stage consumption tax collected whenever a Taxable Entrepreneur (Pengusaha Kena Pajak) supplies Taxable Goods and/or Taxable Services within Indonesia's customs territory; in principle, VAT applies only to the value added at each stage of production and distribution, and under the input–output credit mechanism a Taxable Entrepreneur remits only the difference between output VAT and creditable input VAT for a given tax period.

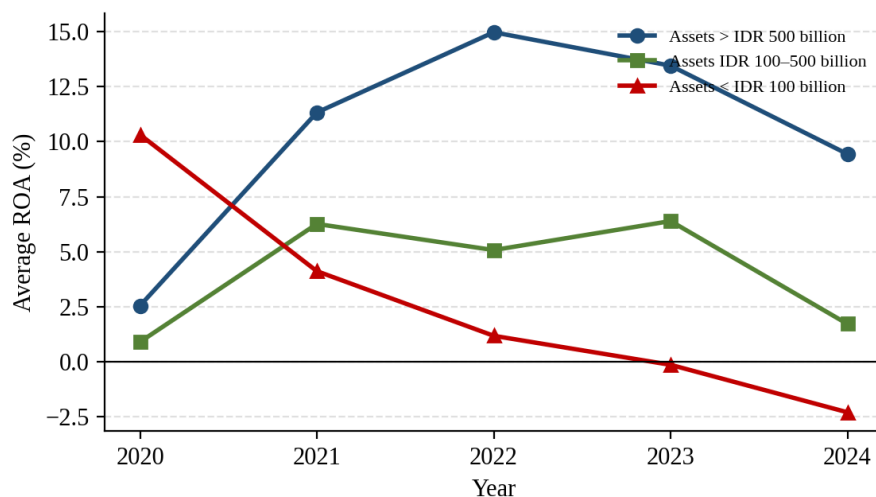
As part of the implementation of the Tax Regulation Harmonization Law, the government issued Minister of Finance Regulation (PMK) No. 71/PMK.03/2022 on VAT for the supply of certain taxable services, which covers, among others, freight-forwarding services. This regulation set a final VAT rate of 1.1% for such services, but simultaneously provided that input VAT incurred by the service provider on supplies subject to this final-rate treatment is not creditable. Because input VAT that would otherwise be creditable becomes a direct cost, this policy fundamentally alters the cost structure of firms in the freight and delivery subsector, potentially raising logistics and operating costs unless offset by operational-efficiency measures. Such a fiscal policy has implications for firms' operating profit and overall cost structure. Restricting input VAT credits may increase direct operating costs, whereas the special final-rate treatment for logistics services may keep the effective VAT burden comparatively low. Consequently, the net effect of this policy is ultimately an empirical question that this study seeks to address.

The average Return on Assets (ROA) of the 20 logistics and deliveries companies listed on the Indonesia Stock Exchange (IDX) increased from 4.52% in 2020 to a peak of 8.75% in 2022. This increase occurred before the VAT rate was raised on 1 April 2022. However, the average ROA subsequently declined to 8.26% in 2023 and further decreased to 4.58% in 2024, as illustrated in Figure 2. A cross-sectional breakdown by asset size further shows that companies with total assets above IDR 500 billion consistently posted higher average ROA than smaller firms, and that firms with total assets below IDR 100 billion experienced a marked ROA decline from 2022 onward, turning negative in 2023 and 2024 (Figure 3).



Source: Indonesia Stock Exchange, 2025 (data reprocessed by the author)

**Figure 2. Average ROA of Sampled Companies, 2020–2024**



Source: Indonesia Stock Exchange, 2025 (data reprocessed by the author)

**Figure 3. Average ROA by Asset-Size Group, 2020–2024**

These trends have prompted several empirical studies on the effect of the VAT increase on firm performance, with mixed results. Putri and Subandoro (2022) found that the 11% VAT rate increase significantly affected sales at PT X, while Syifa' and Suprianik (2025) reported that a further increase to 12% affected the gross profit and financial performance of manufacturing firms in Jember. Zawitri, Yuliana, and Kurniasih (2024) likewise found that the 11% VAT increase affected the financial performance of retail firms listed on the IDX in the 2023 tax year, and Gandana and Kurniawati (2026) found that the VAT adjustment produced mixed effects on the financial performance of listed food-sector firms; Sakinah, Amang, and

Nurwanah (2025) documented an effect of the VAT increase on the liquidity and profit of a trading enterprise. In contrast, Candraningsih and Priyawan (2025) concluded that the VAT rate had no effect on consumer demand and, consequently, no effect on the financial performance of listed retail firms. Cross-country evidence points in similar directions: Sun, Zhan, and Du (2020) found that VAT incentives significantly affected the profitability (return on equity) of new-energy firms among China's listed companies, while Zou, Shen, and Gong (2019) found that China's VAT reform significantly reduced corporate leverage, with improved profitability and cash flow acting as transmission channels.

Firm size, commonly proxied by total assets, is theorized to affect financial performance through economies of scale that allow larger firms to spread fixed costs over greater output and thereby reduce average costs (Marshall, 1890). Empirically, Gifari, Suherman, and Kartini (2025) and Martsila and Meiranto (2013) found that firm size significantly affects financial performance, and Siregar, Jamal, and Pribadi (2025) examined this relationship specifically for transportation and logistics firms listed on the IDX. Other evidence is less conclusive: Saputri and Setiawati (2024) and Lutfiana and Hermanto (2021) found no such effect, arguing that a larger asset base does not automatically translate into stronger returns unless it is managed efficiently, while Yadav, Pahi, and Gangakhedkar (2022), analyzing a large panel of Asia-Pacific firms, documented a negative size-profitability relationship overall.

Leverage, typically proxied by the Debt to Equity Ratio (DER), reflects the extent to which a firm finances its operations and investments through debt. While excessive leverage can erode profitability through higher interest burdens and financial risk, moderate and well-managed leverage may enhance financial performance through tax-shield benefits and additional funding capacity (Modigliani & Miller, 1963). Gifari et al. (2025) and Saputri and Setiawati (2024) reported a significant effect of leverage on financial performance, and Putri and Wardani (2026) similarly found that leverage significantly affected firm value among food-and-beverage firms on the IDX; in contrast, Lutfiana and Hermanto (2021) and Hilmi and Aini (2022) found no significant effect, attributing this to firms' ability to rely on operating income rather than external debt to meet their financing needs.

EBITDA Margin, which is calculated as earnings before interest, taxes, depreciation, and amortization divided by operating revenue, measures a firm's core operating profitability before the effects of financing and tax decisions. This indicator is particularly relevant to the logistics and deliveries subsector, where energy, labor, and asset maintenance costs constitute a substantial proportion of operating expenses. Because relatively small changes in operational efficiency can substantially shift profit margins in this capital-intensive sector, EBITDA Margin is theorized to function as a mediating mechanism linking VAT policy, firm size, and leverage to overall financial performance (Oktariyani, 2019; Alma & Muchtar, 2024).

Previous studies have primarily examined the direct relationship between leverage and financial performance. However, the mechanism through which capital structure decisions influence firm performance has received relatively limited attention. This study proposes EBITDA Margin as a mediating variable because it reflects operating profitability independently of financing costs. Although EBITDA excludes interest expenses by definition, capital structure decisions may still affect operating profitability indirectly through changes in operational efficiency, managerial discipline, cost management, and resource allocation. Therefore, EBITDA Margin is expected to represent an operational pathway through which leverage may influence financial performance.

Although prior studies have examined VAT changes, firm size, and leverage in relation to financial performance, most have focused on manufacturing, retail, trading, or diversified-industry firms, and have generally tested these independent variables in isolation rather than within a single integrated model. Few, if any, studies have examined the joint effect of the VAT increase, firm size, and leverage on financial performance through the mediating role of EBITDA Margin, particularly within Indonesia's logistics and deliveries subsector. This study

addresses that gap by analyzing 20 logistics and deliveries companies listed on the IDX over the 2020–2024 period, spanning two years before and three years after the April 2022 VAT increase.

Specifically, this study aims to examine: (1) the effect of the VAT increase, firm size, and leverage on EBITDA Margin; (2) the effect of the VAT increase, firm size, leverage, and EBITDA Margin on financial performance; and (3) the mediating role of EBITDA Margin in the relationship between the VAT increase, firm size, and leverage, and financial performance.

## METHOD

This study employs a quantitative, explanatory research design (Sugiyono, 2017; Sekaran & Bougie, 2016) to test the causal relationships among the VAT increase, firm size, leverage, EBITDA Margin, and financial performance in logistics and deliveries subsector companies listed on the IDX.

The population comprises logistics and deliveries subsector companies listed on the IDX. Using purposive sampling, 20 companies with complete, publicly available financial statements for the 2020–2024 period were selected (Table 1), yielding 100 firm-year observations, reduced to 98 after the natural-logarithm transformation described below

**Table 1. Sample of Logistics and Deliveries Subsector Companies**

| No | Company Name                                 | IDX Code |
|----|----------------------------------------------|----------|
| 1  | PT Maming Enam Sembilan Mineral Tbk          | AKSI     |
| 2  | PT Pelayaran Nasional Ekalya Purnamasari Tbk | BLTA     |
| 3  | PT Hasnur Internasional Shipping Tbk         | ELPI     |
| 4  | PT Habco Trans Maritima Tbk                  | GTRA     |
| 5  | PT Armada Berjaya Trans Tbk                  | HAIS     |
| 6  | PT Krida Jaringan Nusantara Tbk              | HATM     |
| 7  | PT Pelayaran Kurnia Lautan Semesta Tbk       | JAYA     |
| 8  | PT Mitra International Resources Tbk         | KJEN     |
| 9  | PT Pelayaran Nelly Dwi Putri Tbk             | KLAS     |
| 10 | PT Utama Radar Cahaya Tbk                    | MIRA     |
| 11 | PT Sidomulyo Selaras Tbk                     | NELY     |
| 12 | PT Samudera Indonesia Tbk                    | PPGL     |
| 13 | PT Temas Tbk                                 | PURA     |
| 14 | PT Trimuda Nuansa Citra Tbk                  | RCCC     |
| 15 | PT Guna Timur Raya Tbk                       | SAPX     |
| 16 | PT Sidomulyo Selaras Tbk                     | SDMU     |
| 17 | PT Samudera Indonesia Tbk                    | SMDR     |
| 18 | PT Temas Tbk                                 | TMAS     |
| 19 | PT Trimuda Nuansa Citra Tbk                  | TNCA     |
| 20 | PT Guna Timur Raya Tbk                       | TRUK     |

Source: Indonesia Stock Exchange, 2020–2024 (data reprocessed by the author)

Secondary data were obtained from the audited annual financial statements published by the IDX and by the companies' official websites, including total assets, total liabilities, total equity, operating revenue, depreciation, EBITDA, and net income (Kuncoro, 2009), collected and documented following the documentation method described by Sugiyono (2017).

Table 2 summarizes the operational definition and measurement of each variable. The VAT increase (X1) is a policy dummy variable coded 0 for the pre-policy period (2020–2021)

and 1 for the post-policy period (2022–2024); firm size (X2) is proxied by total assets; leverage (X3) is proxied by the Debt to Equity Ratio (DER); EBITDA Margin (Z) is measured as EBITDA divided by operating revenue and serves as the mediating variable; and financial performance (Y) is proxied by Return on Assets (ROA).

**Table 2. Operational Definition and Measurement of Variables**

| Variable                  | Type        | Proxy                 | Measurement                                                                       | Scale   |
|---------------------------|-------------|-----------------------|-----------------------------------------------------------------------------------|---------|
| VAT Increase (X1)         | Independent | Policy dummy variable | 0 = pre-VAT-increase period (2020–2021); 1 = post-VAT-increase period (2022–2024) | Nominal |
| Firm Size (X2)            | Independent | Total Assets          | Ln (Total Assets)                                                                 | Ratio   |
| Leverage (X3)             | Independent | Debt to Equity Ratio  | Ln (Total Liabilities / Total Equity)                                             | Ratio   |
| EBITDA Margin (Z)         | Mediating   | EBITDA Margin         | EBITDA / Operating Revenue                                                        | Ratio   |
| Financial Performance (Y) | Dependent   | Return on Assets      | Net Income / Total Assets                                                         | Ratio   |

Source: Compiled by the author

Data were analyzed using unbalanced panel data regression in Eviews, which combines the cross-sectional and time-series dimensions of the data to increase estimation efficiency and reduce multicollinearity relative to purely cross-sectional or time-series data (Gujarati & Porter, 2009). Because total assets and DER exhibited a wide range and extreme values that produced non-normal residuals and heteroskedasticity in preliminary models, both variables were transformed using the natural logarithm (Ln), which reduces skewness, limits the influence of outliers, and stabilizes residual variance (Gujarati & Porter, 2009). Two observations could not be log-transformed because of negative DER values, reducing the effective sample to 98 firm-year observations.

Two panel regression equations were estimated:

$$Z_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} \quad (1)$$

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 Z_{it} \quad (2)$$

where Z is EBITDA Margin, Y is financial performance (ROA), and X1, X2, and X3 are the VAT increase, firm size, and leverage, respectively.

The Chow, Hausman, and Lagrange Multiplier (LM) tests were conducted sequentially to determine the most appropriate panel data estimation model. The selection was made among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) for each equation. Classical assumption tests included the Jarque-Bera test for residual normality, the Variance Inflation Factor (VIF) for multicollinearity (VIF < 10 indicating the absence of multicollinearity), and the Glejser test for heteroskedasticity; White cross-section (period-clustered) robust standard errors were applied to the selected models as an additional safeguard against heteroskedasticity, following the approach adopted in recent Indonesian panel studies such as Alfairus, Mubaraq, and Amalia (2026).

Hypotheses were tested using two-tailed t-tests for individual coefficients and F-tests for overall model significance, at a 5% significance level. The mediating role of EBITDA Margin was tested using the Sobel test (Preacher & Leonardelli, n.d.), with mediation considered statistically significant when the absolute value of the Sobel z-statistic exceeded 1.96 ( $p < 0.05$ ).

## RESULTS AND DISCUSSION

### Descriptive Statistics

After natural-logarithm transformation of firm size and leverage, the working dataset comprised 98 firm-year observations (Table 3). The VAT-increase dummy averaged 0.612, indicating that most observations fall in the post-policy period (2022–2024). Log-transformed firm size averaged 26.64 (range 22.88–30.67, SD 1.52), and log-transformed leverage averaged –0.70 (range –3.73 to 3.73, SD 1.20); both distributions were relatively homogeneous following transformation, compared to a highly skewed distribution in the original, untransformed units. EBITDA Margin averaged 23.19% (range –27.29% to 63.92%, SD 16.99%), and financial performance (ROA) averaged 6.27% (range –24.53% to 31.82%, SD 9.39%).

**Table 3. Descriptive Statistics (After Natural-Logarithm Transformation)**

| Statistic    | X1    | X2 (Ln Assets) | X3 (Ln DER) | Z (EBITDA Margin) | Y (ROA) |
|--------------|-------|----------------|-------------|-------------------|---------|
| Mean         | 0.612 | 26.6396        | –0.7031     | 0.2319            | 0.0627  |
| Median       | 1.000 | 26.5002        | –0.7354     | 0.2214            | 0.0452  |
| Maximum      | 1.000 | 30.6673        | 3.7292      | 0.6392            | 0.3182  |
| Minimum      | 0.000 | 22.8777        | –3.7268     | –0.2729           | –0.2453 |
| Std. Dev.    | 0.490 | 1.5239         | 1.1988      | 0.1699            | 0.0939  |
| Observations | 98    | 98             | 98          | 98                | 98      |

Source: Eviews output, processed by the author

### Panel Data Model Selection and Classical Assumption Tests

Table 4 summarizes the panel-data model-selection and classical assumption tests for both structural equations. For Structure 1 (EBITDA Margin as the dependent variable), the Chow test favored the Fixed Effect Model over the Common Effect Model ( $F = 8.180$ ,  $p = 0.0000$ ), but the Hausman test favored the Random Effect Model over the Fixed Effect Model ( $\chi^2 = 4.064$ ,  $p = 0.2546$ ); the Breusch-Pagan LM test then confirmed the Random Effect Model over the Common Effect Model ( $LM = 62.510$ ,  $p = 0.0000$ ). Structure 1 was therefore estimated using the Random Effect Model. For Structure 2 (financial performance as the dependent variable), both the Chow test ( $F = 6.477$ ,  $p = 0.0000$ ) and the Hausman test ( $\chi^2 = 9.743$ ,  $p = 0.0450$ ) favored the Fixed Effect Model, which was accordingly used for Structure 2.

Residual normality was supported for both structures (Jarque-Bera  $p = 0.3003$  and  $p = 0.1446$ , respectively, both exceeding 0.05). Multicollinearity was not a concern, as the centered VIF for all independent variables remained close to 1 and well below the conventional threshold of 10. The Glejser test indicated the absence of heteroskedasticity in either structure ( $\chi^2$   $p = 0.3521$  and  $p = 0.7358$ , respectively); White cross-section (period-clustered) robust standard errors were nonetheless applied to further safeguard statistical inference.

**Table 4. Panel Data Model Selection and Classical Assumption Test Results**

| Test                        | Structure 1 (Z) Statistic | Prob.  | Structure 2 (Y) Statistic | Prob.  | Decision                                 |
|-----------------------------|---------------------------|--------|---------------------------|--------|------------------------------------------|
| Chow test (Cross-section F) | 8.180                     | 0.0000 | 6.477                     | 0.0000 | FEM preferred over CEM (both structures) |
| Hausman test (Chi-Sq.)      | 4.064                     | 0.2546 | 9.743                     | 0.0450 | REM (Structure 1) / FEM (Structure 2)    |
| LM test (Breusch-Pagan)     | 62.510                    | 0.0000 | –                         | –      | REM preferred over CEM (Structure 1)     |
| Jarque-Bera (normality)     | –                         | 0.3003 | –                         | 0.1446 | Residuals normally distributed           |

| Test                                            | Structure 1<br>(Z) Statistic    | Prob.  | Structure 2<br>(Y) Statistic | Prob.  | Decision      |
|-------------------------------------------------|---------------------------------|--------|------------------------------|--------|---------------|
| Glejser test<br>(heteroskedasticity, $\chi^2$ ) | –                               | 0.3521 | –                            | 0.7358 | Homoskedastic |
| Final model selected                            | Random<br>Effect Model<br>(REM) |        | Fixed Effect<br>Model (FEM)  |        |               |

Source: Eviews output, processed by the author. FEM = Fixed Effect Model; REM = Random Effect Model; CEM = Common Effect Model.

### Panel Regression Results and Direct-Effect Hypothesis Testing

Table 5 presents the panel regression results for both structural equations. For Structure 1, the estimated model was  $Z = -1.0083 + 0.0346X_1 + 0.0449X_2 - 0.0311X_3$ , with an adjusted  $R^2$  of 0.1630, indicating that the VAT increase, firm size, and leverage jointly explain 16.30% of the variation in EBITDA Margin, while the remaining 83.70% is explained by variables outside the model (F-statistic Prob. = 0.000188). Firm size had a significant positive effect on EBITDA Margin ( $p = 0.0027$ ), whereas the VAT increase ( $p = 0.1109$ ) and leverage ( $p = 0.0515$ ) had no significant effect.

For Structure 2, the estimated model was  $Y = 0.0098 - 0.0038X_1 - 0.0026X_2 - 0.0318X_3 + 0.4461Z$ , with an adjusted  $R^2$  of 0.6898 (F-statistic Prob. = 0.0000), indicating that the model explains 68.98% of the variation in financial performance. Leverage had a significant negative effect on financial performance ( $p = 0.0065$ ), and EBITDA Margin had a significant positive effect ( $p = 0.0000$ ), while the VAT increase ( $p = 0.7687$ ) and firm size ( $p = 0.8224$ ) had no significant effect.

**Table 5. Panel Data Regression Results**

| Table 5.1 Panel Data Regression Results                                        |             |        |                                     |  |
|--------------------------------------------------------------------------------|-------------|--------|-------------------------------------|--|
| Structure 1 – Dependent Variable:<br>EBITDA Margin (Z), Random<br>Effect Model |             |        |                                     |  |
|                                                                                | Coefficient | Prob.  | Result                              |  |
| Constant                                                                       | −1.0083     | –      | –                                   |  |
| VAT Increase (X1)                                                              | 0.0346      | 0.1109 | Not significant (H1 rejected)       |  |
| Firm Size (X2)                                                                 | 0.0449      | 0.0027 | Significant, positive (H2 accepted) |  |
| Leverage (X3)                                                                  | −0.0311     | 0.0515 | Not significant (H3 rejected)       |  |
| Adjusted R <sup>2</sup> = 0.1630; F-statistic Prob. = 0.000188                 |             |        |                                     |  |

| Structure 2 – Dependent Variable:<br>Financial Performance (Y), Fixed<br>Effect Model |             |        |                                     |
|---------------------------------------------------------------------------------------|-------------|--------|-------------------------------------|
|                                                                                       | Coefficient | Prob.  | Result                              |
| Constant                                                                              | 0.0098      | –      | –                                   |
| VAT Increase (X1)                                                                     | –0.0038     | 0.7687 | Not significant (H4 rejected)       |
| Firm Size (X2)                                                                        | –0.0026     | 0.8224 | Not significant (H5 rejected)       |
| Leverage (X3)                                                                         | –0.0318     | 0.0065 | Significant, negative (H6 accepted) |
| EBITDA Margin (Z)                                                                     | 0.4461      | 0.0000 | Significant, positive (H7 accepted) |
| Adjusted R <sup>2</sup> = 0.6898; F-statistic Prob. = 0.0000                          |             |        |                                     |

Source: Eviews output, processed by the author. Standard errors are White cross-section (period-clustered) robust standard errors.

### Mediation Analysis (Sobel Test)

Table 6 reports the Sobel mediation test results for the indirect effect of each independent variable on financial performance through EBITDA Margin. EBITDA Margin significantly mediated the effect of firm size on financial performance ( $z = 2.824$ ,  $p = 0.0047$ ), but did not

significantly mediate the effects of the VAT increase ( $z = 1.569$ ,  $p = 0.1166$ ) or leverage ( $z = -1.900$ ,  $p = 0.0575$ ) on financial performance, although the leverage pathway approached the conventional 5% significance threshold.

**Table 6. Sobel Mediation Test Results**

| Hyp. | Indirect Path                                                     | Sobel z | Prob.  | Decision                                      |
|------|-------------------------------------------------------------------|---------|--------|-----------------------------------------------|
| H8   | VAT Increase (X1) → EBITDA Margin (Z) → Financial Performance (Y) | 1.569   | 0.1166 | Not significant (H8 rejected)                 |
| H9   | Firm Size (X2) → EBITDA Margin (Z) → Financial Performance (Y)    | 2.824   | 0.0047 | Significant, positive mediation (H9 accepted) |
| H10  | Leverage (X3) → EBITDA Margin (Z) → Financial Performance (Y)     | -1.900  | 0.0575 | Not significant (H10 rejected)                |

Source: Sobel test calculator (Preacher & Leonardelli, n.d.), processed by the author

**Table 7. Summary of Hypothesis Testing**

| Hyp. | Statement                                                                  | Result   |
|------|----------------------------------------------------------------------------|----------|
| H1   | VAT increase affects EBITDA Margin                                         | Rejected |
| H2   | Firm size affects EBITDA Margin                                            | Accepted |
| H3   | Leverage affects EBITDA Margin                                             | Rejected |
| H4   | VAT increase affects financial performance                                 | Rejected |
| H5   | Firm size affects financial performance                                    | Rejected |
| H6   | Leverage affects financial performance                                     | Accepted |
| H7   | EBITDA Margin affects financial performance                                | Accepted |
| H8   | EBITDA Margin mediates the effect of VAT increase on financial performance | Rejected |
| H9   | EBITDA Margin mediates the effect of firm size on financial performance    | Accepted |
| H10  | EBITDA Margin mediates the effect of leverage on financial performance     | Rejected |

Source: Processed by the author

## Discussion

Consistent with tax-incidence theory, under which VAT is ultimately intended to be borne by the final consumer rather than the seller, the VAT increase showed no significant effect on either EBITDA Margin or financial performance in this study. Because EBITDA Margin measures operating profitability before interest, tax, depreciation, and amortization, it is conceptually insulated from a consumption-tax adjustment whose statutory incidence falls on the buyer. In addition, freight and delivery services represent essential inputs for trade and economic activity, sustaining relatively stable demand even as the applicable VAT treatment changed; this may explain why sampled firms were able to absorb the policy adjustment without a measurable effect on operating margins or asset returns. This finding is consistent with the findings of Candraningsih and Priyawan (2025), who also reported no significant effect of VAT policy on financial performance. However, it contrasts with the significant effects reported by Syifa' and Suprianik (2025) and Putri and Subandoro (2022) in other sectors. The finding is also consistent with the special VAT treatment for freight-forwarding services under PMK No. 71/PMK.03/2022. Under this regulation, the effective VAT burden is limited to a final rate of 1.1%, rather than the standard VAT rate applied to the full value of taxable supplies. Although input VAT is no longer creditable, the relatively low effective VAT burden may have mitigated the impact of the VAT policy on firms' financial performance.

Firm size had a significant positive effect on EBITDA Margin, consistent with economies-of-scale theory (Marshall, 1890) and with the findings of Martsila and Meiranto (2013) and Gifari et al. (2025): larger firms typically possess broader distribution networks,

more advanced technology, and greater operational efficiency, allowing fixed costs to be spread over a larger revenue base. However, firm size had no significant direct effect on financial performance (ROA), suggesting that a larger asset base does not automatically translate into higher returns; larger firms also carry higher asset-maintenance and operating costs that may offset scale advantages if not managed effectively, consistent with Saputri and Setiawati (2024) and Lutfiana and Hermanto (2021).

The insignificant relationship between leverage and EBITDA Margin suggests that differences in capital structure do not directly translate into changes in operating profitability. This finding is theoretically reasonable because EBITDA excludes interest expenses and therefore isolates operating performance from financing decisions. Consequently, any influence of leverage on EBITDA Margin is more likely to occur through indirect operational adjustments than through the direct effect of financing costs. This explains why the estimated coefficient was statistically insignificant despite the significant direct effect of leverage on ROA.

However, leverage had a significant negative effect on financial performance. This finding is consistent with debt capacity theory, which holds that firms face an optimal debt threshold beyond which additional borrowing increases interest expense, default risk, and the likelihood of financial distress faster than it generates offsetting returns (Modigliani & Miller, 1963). The results suggest that, on average, sampled firms may be operating near or beyond this optimal debt threshold, such that further leverage constrains rather than enhances ROA, consistent with Gifari et al. (2025) and Saputri and Setiawati (2024) but contrasting with the non-significant findings reported by Lutfiana and Hermanto (2021) and Hilmi and Aini (2022).

EBITDA Margin had a significant positive direct effect on financial performance, confirming that stronger operating profitability translates into higher returns on assets, consistent with Oktariyani (2019) and Alma and Muchtar (2024). In line with this direct effect, EBITDA Margin significantly mediated the relationship between firm size and financial performance, indicating that larger firms enhance financial performance primarily through improved operational efficiency rather than through a direct scale effect. By contrast, EBITDA Margin did not mediate the effects of the VAT increase or leverage on financial performance. This result can be explained by the absence of a significant effect of the VAT increase on EBITDA Margin and the only marginal effect of leverage on EBITDA Margin. Consequently, the indirect effect transmitted through operating margins was limited. Instead, the negative effect of leverage on financial performance appears to operate primarily through increased financial risk and higher interest costs rather than through changes in operating margins.

## CONCLUSION

This study examined the effect of the VAT increase, firm size, and leverage on the financial performance of 20 logistics and deliveries subsector companies listed on the Indonesia Stock Exchange during 2020–2024, with EBITDA Margin serving as a mediating variable. The results indicate that firm size significantly and positively affects EBITDA Margin, while the VAT increase and leverage do not. Leverage significantly and negatively affects financial performance, while the VAT increase and firm size show no significant direct effect. EBITDA Margin itself significantly and positively affects financial performance and significantly mediates the effect of firm size on financial performance, although it does not mediate the effects of the VAT increase or leverage. Overall, these findings suggest that the 2022 VAT rate increase, at least as implemented for freight-forwarding services under PMK No. 71/PMK.03/2022, has not materially undermined the operating profitability or financial performance of the sampled logistics and deliveries firms. By contrast, capital structure decisions, as reflected in the leverage ratio, play a more important role in determining financial performance than either firm size or the VAT policy change examined in this study.

For policymakers, these results suggest that the current VAT treatment of logistics services need not be viewed as an immediate threat to sector-wide financial performance,

though continued monitoring remains warranted to ensure that tax policy supports both revenue objectives and business sustainability over the longer term. For company management, the findings underscore the importance of prudent capital-structure management and continued attention to operational efficiency, given the demonstrated link between leverage, EBITDA Margin, and financial performance. For investors, leverage levels appear to be a more informative signal of financial-performance risk in this subsector than either firm size or exposure to the VAT policy change. This study is limited by its focus on a single subsector, a five-year observation window, and a restricted set of independent variables; future research could extend the observation period, broaden the sample to other transportation-related subsectors, and incorporate additional variables, such as liquidity, corporate governance, or macroeconomic conditions, to further strengthen the generalizability of these findings.

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