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Determinants Of Transfer Pricing, Leverage, And Tax Treaty On Tax Avoidance: Industrials And Basic Materials Sectors

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Abstract

This study examines whether transfer pricing intensity, leverage, and tax treaty exposure explain tax avoidance in Indonesian industrials and basic materials manufacturers. Prior Indonesian studies focus mainly on transfer pricing and leverage, report mixed findings, and rarely test tax treaties at the firm level, so we test the three determinants jointly within an agency theory framework. Using multiple linear regression on 107 firm-year observations from 32 profitable firms listed on the Indonesia Stock Exchange during 2022–2025, with tax avoidance proxied by the effective tax rate (ETR), we find that the three variables jointly explain avoidance (F-test p = 0.002; adjusted R^2 = 0.108). Transfer pricing intensity has no significant effect. Leverage has a positive and significant effect on tax avoidance (p = 0.006), consistent with the interest tax shield argument, and the result holds under firm-clustered standard errors. Tax treaty exposure has a negative and significant effect under conventional standard errors, but this rests on a single non-treaty observation. The findings indicate that tax avoidance is more sensitive to debt financing policy and tax treaty provisions than to related-party transaction schemes, and that treaty effects require richer measurement.

Keywords: Tax Avoidance; Transfer Pricing; Leverage; Tax Treaty; Effective Tax Rate

INTRODUCTION

Tax is the main source of state revenue, yet for a firm it is a cost that directly reduces profit. This conflict of interest encourages firms to manage their tax burden, and one form of that management is tax avoidance: reducing tax liabilities by exploiting provisions of tax law without breaching its letter, although it departs from the purpose of the rules (Hanlon & Heitzman, 2010; Napitupulu et al., 2020; Zahri et al., 2025). The scale of the issue is considerable for Indonesia. Its tax-to-GDP ratio was 10.21% in 2023,

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against 16–18% in Malaysia, Thailand, and Cambodia (Yahya, 2024), and the Tax Justice Network estimated that tax avoidance costs Indonesia about US$4.86 billion (Rp68.7 trillion) a year, mostly from corporate taxpayers (Santoso, 2020). A low tax ratio does not by itself prove avoidance, but it signals revenue that is not being collected. Globally, base erosion and profit shifting (BEPS) schemes typically exploit gaps in domestic tax rules to move profit to jurisdictions with minimal or no taxation (Muslimah, 2020).

Manufacturing is a particularly relevant setting. The sector contributed 18.34%, 18.67%, and 18.98% of GDP in 2022, 2023, and 2024 (Nurdifa, 2025) and more than Rp312 trillion of tax revenue in 2024, far above the Rp127 trillion from international trade (Tamba, 2025). Manufacturers also sit in global supply chains, own foreign affiliates, and trade with related parties, so their cross-border exposure is high.

Three channels dominate the literature. First, transfer pricing, the pricing of transactions between related parties, is legitimate when it follows the arm's length principle but can shift profit to low-tax jurisdictions when it does not (Merle et al., 2019; Putri et al., 2024). Second, leverage generates deductible interest that lowers taxable income (Merle et al., 2019). Third, tax treaties exist to prevent double taxation, but their benefits can be abused through treaty shopping (Putri et al., 2024; Sinaga et al., 2025). The government has responded with Minister of Finance Regulation No. 172 of 2023 on the arm's length principle, Presidential Regulation No. 77 of 2019 ratifying the Multilateral Instrument (MLI), and the thin capitalization rule in Minister of Finance Regulation No. 169 of 2015 (Kementerian Keuangan RI, 2015, 2023; Republik Indonesia, 2019).

The empirical evidence is inconclusive. Rani et al. (2025) report significant effects of transfer pricing and leverage on tax avoidance, whereas Wijaya and Suparmun (2023), Hanifah and Saepuloh (2024), Napitupulu et al. (2020), and Arianto and Apriwenni (2026) find no significant transfer pricing effect. For tax treaties, Indonesian work is largely doctrinal or qualitative (Kurniawan & Rahayu, 2022; Putra & Rahayu, 2023; Putri et al., 2024), and firm-level quantitative tests are, to our knowledge, scarce. Few studies place the three determinants in a single model.

This study addresses that gap. It asks whether transfer pricing intensity, leverage, and tax treaty exposure, individually and jointly, are associated with tax avoidance among industrials and basic materials firms listed on the Indonesia Stock Exchange (IDX) in 2022–2025. The contribution is threefold: (i) a joint test of three avoidance channels in one specification; (ii) one of the few firm-level tests of a treaty variable in Indonesia; and (iii) transparent reporting of how sensitive the findings are to outlier treatment and to the choice of standard errors.

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LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Agency theory and tax avoidance

Agency theory describes a contract in which shareholders (principals) delegate decisions to managers (agents) who pursue their own utility and may not always act in the principals' interest, creating agency costs, which comprise monitoring costs, bonding costs, and residual loss (Jensen & Meckling, 1976; Ross, 1973). Agency theory also explains the financing choices of Indonesian manufacturers, which must balance the cost of capital, bankruptcy risk, and agency costs (Sumani et al., 2020). In taxation, information asymmetry lets managers use tax planning to lift reported performance and, through it, their own evaluation and compensation (Arianto & Apriwenni, 2026). The theory cuts both ways. It predicts opportunistic tax planning where monitoring is weak, but it also predicts restraint where external monitors, such as creditors, tax authorities, and treaty partners exchanging information, raise the expected cost of aggressive positions. This dual prediction frames our hypotheses and the interpretation of results.

Following Merle et al. (2019), tax avoidance is measured by the effective tax rate (ETR), income tax expense divided by profit before tax. Hypotheses are stated as the direction of each variable's effect on the tax avoidance variable and are tested through the sign of the regression coefficient.

Transfer pricing and tax avoidance

Transfer pricing covers the pricing of goods, services, intangibles, and financing between related parties. The OECD arm's length principle requires such prices to match those between independent parties; when it is ignored, profit can move from high-tax to low-tax jurisdictions (Panjalusman et al., 2018). The more a firm transacts with related parties, the more room managers have to shape the profit reported in each entity (Putri et al., 2024). A content analysis of Indonesian Tax Court rulings shows that the pricing of related-party sales and management fees recurs in disputed avoidance cases (Turwanto et al., 2022), and Merle et al. (2019) find that French firms with lower tax rates display higher transfer pricing intensity. Against this, several Indonesian studies find no effect (Napitupulu et al., 2020; Wijaya & Suparmun, 2023), possibly because documentation rules constrain aggressive pricing. Following Merle et al. (2019), intensity is measured by the share of related-party receivables in total receivables, and we state:

H1: Transfer pricing intensity has a positive effect on tax avoidance.

Leverage and tax avoidance

Interest is deductible, so debt financing lowers taxable income and creates a tax shield (Merle et al., 2019). On this logic, more leveraged firms should show greater avoidance, and Sholihah and Rahmiati (2024) and Christina et al. (2024) report a

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significant leverage effect for Indonesian manufacturers. Three considerations temper the prediction. Interest deductibility is restricted by the thin capitalization rule, which caps the tax-recognized debt-to-equity ratio at 4:1 (Kementerian Keuangan RI, 2015), and evidence on that rule is itself mixed (Kirnanda et al., 2024; Natalia & Widyadhana, 2021; Ramadhan, 2023). Firms with other tax-saving devices need less debt, because non-debt tax shields substitute for interest shields (DeAngelo & Masulis, 1980) and firms engaged in tax shelters carry less debt (Graham & Tucker, 2006). And creditors monitor borrowers, which can discipline managerial discretion (Jensen & Meckling, 1976). The theoretically expected sign remains that of the tax shield, so:

H2: Leverage has a positive effect on tax avoidance.

Tax treaty and tax avoidance

Tax treaties allocate taxing rights between source and residence states and reduce withholding rates on dividends, interest, and royalties. Their purpose is to prevent double taxation, not to enable avoidance, but differences in rates and facilities across treaties allow treaty shopping, in which a taxpayer routes income through a conduit to claim benefits not intended for it (Putri et al., 2024; Sinaga et al., 2025). Treaty relief, however, applies only to passive income such as interest, dividends, and royalties, which is taxed by withholding when it is paid and therefore leaves little room for profit manipulation compared with the active business income subject to corporate income tax. Verification of documents (certificate of domicile and proof of beneficial ownership), the Principal Purpose Test introduced through the MLI (Kurniawan & Rahayu, 2022), and information exchange provisions further raise the expected cost of aggressive positions, which limits the scope for treaty shopping even where treaty benefits differ across jurisdictions. Treaty exposure should therefore constrain rather than facilitate avoidance on corporate income tax, and we predict:

H3: Exposure to tax treaty partner jurisdictions has a negative effect on tax avoidance.

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Figure 1 summarizes the three hypothesized relationships.

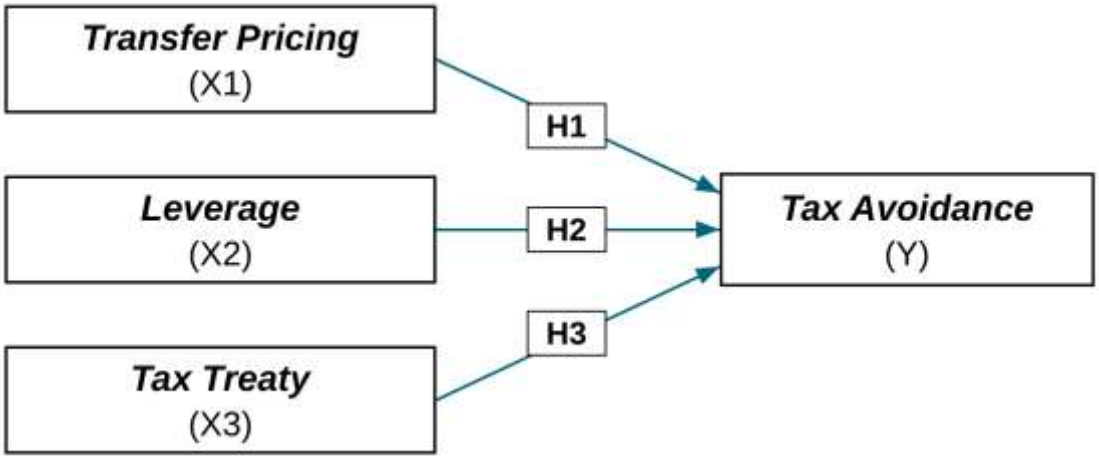


Figure 1. Conceptual Framework

Source: Authors' compilation (2026).

RESEARCH METHODS

Approach, data, and sample

The study uses a quantitative approach with a descriptive design (Azwar, 2017) and tests the contribution of the independent variables with regression (Sugiyono, 2013), following the specification logic of Merle et al. (2019). The data are secondary pooled cross-sectional time-series panel data analyzed by multiple linear regression. Data come from audited consolidated annual financial statements published on the IDX website (www.idx.co.id) and on company websites. The population is all 962 firms listed on the IDX. The sample is drawn by purposive sampling (Amin et al., 2023) from industrials and basic materials firms for 2022–2025 using five criteria: (1) listed in these sectors throughout 2022–2025; (2) initial public offering no later than 2022, so four years of data exist; (3) no net loss in the period, because ETR is not meaningful for loss-making firms; (4) at least one foreign affiliate, branch, or subsidiary; and (5) consistent publication of accessible audited annual reports. Most sample firms close their books on 31 December; firms with other year-ends are analyzed by fiscal year. Table 1 summarizes the selection.

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Table 1. Sample Selection

Criterion	Firms
Firms listed on the IDX	962
Outside industrials and basic materials	(782)
Industrials and basic materials firms	180
IPO after 2022	(31)
Loss-making during 2022–2025	(64)
No foreign affiliate, branch, or subsidiary	(43)
Inconsistent or inaccessible annual reports	(6)
Firms in sample	**36**
Firm-year observations (36 × 4 years)	144
Outliers removed (1.5 × IQR rule)	(37)
Final firm-year observations (32 firms)	**107**

Source: Authors' compilation from IDX data.

Variables and model

Table 2 defines the variables. Transfer pricing includes all related-party receivables, domestic and foreign, because many firms do not disclose counterparty details. All foreign investment by sample firms is treated as business expansion and not as transactions with tax-haven countries.

Table 2. Variable Measurement

Variable	Symbol	Measurement	Reference
Tax avoidance	ETR	Income tax expense / profit before tax (lower value = more avoidance)	Merle et al. (2019)
Transfer pricing	TP	Related-party receivables / total receivables	Merle et al. (2019)
Leverage	LEV	Total liabilities / total equity (DER)	Merle et al. (2019)
Tax treaty	TT	Dummy: 1 if foreign affiliates are domiciled in a jurisdiction with a tax treaty with Indonesia, 2 otherwise	Authors

The estimated model is:

$$ETR(it) = \beta 0 + \beta 1 \cdot TP(it) + \beta 2 \cdot LEV(it) + \beta 3 \cdot TT(it) + \varepsilon(it)$$

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Where i indexes firms and t years. H1 and H2 predict positive coefficients on the tax avoidance variable. Because TT is coded 2 for the absence of a treaty, H3 (treaty exposure reduces tax avoidance) predicts a negative coefficient on TT.

Estimation and diagnostics

The baseline model was estimated by ordinary least squares in IBM SPSS Statistics 27, with significance judged at 5% using t-tests for individual effects, an F-test for joint significance, and adjusted R^2 for explanatory power. Classical assumption tests cover normality (Kolmogorov–Smirnov), multicollinearity (tolerance above 0.10 and variance inflation factor, VIF, below 10; Merle et al., 2019), heteroskedasticity (Glejser, regressing absolute residuals on the log-transformed regressors), and autocorrelation (Durbin–Watson, with the −2 to +2 criterion) (Hutagaol, 2025; Sholihah et al., 2023). Residuals from the initial 144-observation model failed the normality test ($p < 0.001$), so observations outside the 1.5 × interquartile-range (IQR) fences for ETR, TP, or LEV were removed (Ramadhani & Susanto, 2026). This leaves 107 observations; four firms (BRPT, JECC, MFMI, and TKIM) lose all their observations; Appendix A lists the sample firms and the removed observations. Because firm-years of the same company are not independent, we also report HC3 heteroskedasticity-robust and firm-clustered standard errors and a full-sample estimate. These robustness estimates were replicated in Python from the same data set.

RESULTS AND DISCUSSION

Descriptive statistics

Table 3. Descriptive Statistics (N = 107)

Variable	Minimum	Maximum	Mean	Std. Dev.
ETR	0.1184	0.3144	0.2223	0.0366
TP	0.0000	1.0000	0.3085	0.3718
LEV	0.0865	1.5970	0.5146	0.3374
TT (1 = treaty, 2 = none)	1	2	1.0093	0.0967

The mean ETR of 22.2% is almost identical to the 22% statutory rate, and its dispersion is narrow, which is expected in a sample of firms profitable in every year. Transfer pricing intensity varies widely: the first and third quartiles are 0.004 and 0.68. Zero values occur for Ifishdeco (2022, 2024, 2025), Ateliers Mécaniques d'Indonésie (2025), Champion Pacific Indonesia, Mark Dynamics Indonesia, and Suparma, and the maximum of 1.000 for Vale Indonesia (2022–2024) and Bumi Resources Minerals (2024). The lowest ETR (0.1184) is MNC Asia Holding in 2023 and the highest (0.3144) is Wijaya

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Karya Beton in 2022; the same firm-year has the highest DER (1.5970), whereas the lowest DER (0.0865) is Ekadharma International in 2024. The mean DER of 0.51 shows that sample firms rely more on equity than debt. For treaty exposure, 106 of 107 firm-years are coded 1, meaning foreign affiliates sit in treaty partner jurisdictions; the single exception (coded 2) is one observation of Bakrie & Brothers (2024). Annual means show ETR falling from 23.0% in 2022 to 22.2%, 22.1%, and 21.6% in 2023, 2024, and 2025, while mean DER fell from 0.58 to 0.51, 0.49, and 0.48.

Classical assumption tests

Table 4. Diagnostic Tests

Test	Result	Conclusion
Kolmogorov–Smirnov, 144 observations	Sig. < 0.001	Residuals not normal; outliers screened
Kolmogorov–Smirnov, 107 observations	Sig. = 0.200	Residuals normal
Tolerance / VIF	TP 0.984 / 1.016; LEV 0.984 / 1.016; TT 0.992 / 1.008	No multicollinearity
Glejser (Sig.)	TP 0.473; LEV 0.054; TT 0.169	All above 0.05: no heteroskedasticity
Durbin–Watson	1.391	Within −2 to +2: no autocorrelation

Normality is achieved only after outlier removal. All Glejser significance values exceed 0.05, so the model shows no sign of heteroskedasticity, and the Durbin–Watson statistic of 1.391 lies within the −2 to +2 range, so no autocorrelation is indicated. Because the same firms are observed in several years, the robustness analysis below nevertheless checks the results with robust and firm-clustered standard errors.

Regression results

Table 5. Multiple Regression Results (Dependent Variable: ETR)

Variable	Coefficient	Std. Error	t	Sig.
Constant	0.293	0.036	8.218	< 0.001
TP	0.014	0.009	1.593	0.114
LEV	0.028	0.010	2.823	0.006
TT	−0.089	0.035	−2.565	0.012

Note: N = 107; R^2 = 0.134; adjusted R^2 = 0.108; F = 5.290 (Sig. 0.002). TT is coded 1 for treaty-partner exposure and 2 otherwise. Recoding the dummy as 1/0 (0 = no treaty) gives the same fit, with a TT coefficient of +0.089 and a constant of 0.115.

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The estimated equation is ETR = 0.293 + 0.014·TP + 0.028·LEV − 0.089·TT + ε. The intercept is the predicted ETR when all regressors equal zero, while each coefficient is the change in ETR for a one-unit rise in that regressor, holding the others constant.

The three variables jointly explain tax avoidance (F-test Sig. 0.002), although adjusted R^2 shows that they account for only 10.8% of ETR variation, leaving 89.2% to factors outside the model. This is higher than the 7.2–7.6% reported by Merle et al. (2019), although their model explains a different dependent variable. Individually, transfer pricing is not significant (p = 0.114), so H1 is not supported. Leverage is significant (p = 0.006) and its coefficient is positive (0.028), as predicted by H2, so H2 is supported. The treaty coefficient is negative and significant (p = 0.012). H3 predicted a negative coefficient, so H3 is supported at the 5% level under conventional standard errors, although the robustness checks below show that this result is fragile.

Robustness checks

Table 6. Significance (p-values) of Coefficients under Alternative Specifications

Specification	N	TP	LEV	TT
(1) Baseline OLS	107	0.114	0.006	0.012
(2) HC3 robust standard errors	107	0.123	0.014	0.123
(3) Firm-clustered standard errors	107	0.280	0.041	n/a†
(4) Full sample, OLS	144	0.170	0.480	0.064
(5) Full sample, HC3	144	0.093	0.439	0.029

Note: The TP and LEV coefficients are positive on ETR in every specification; the TT coefficient is negative (1/2 coding). †With one non-treaty observation, the treaty cluster is a single firm-year and its clustered standard error is degenerate. Full-sample adjusted R^2 = 0.021; F-test Sig. = 0.116.

Three patterns emerge. First, the leverage result survives robust and clustered standard errors (p between 0.006 and 0.041), while transfer pricing is never significant at 5%. Second, the treaty result is fragile: it loses significance with HC3 standard errors (p = 0.123) and, as discussed under tax treaty below, it rests on a single observation. Third, the findings depend on outlier screening. With all 144 observations, the leverage coefficient shrinks from 0.028 to 0.009 (p = 0.480) and the joint F-test is no longer significant; the largest DER in the full sample is 10.44.

DISCUSSION

1. Transfer pricing

Transfer pricing intensity has no significant effect on tax avoidance, in line with Napitupulu et al. (2020), Wijaya and Suparmun (2023), Hanifah and Saepuloh (2024),

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and Arianto and Apriwenni (2026), and in contrast to Rani et al. (2025), Poernomo and D (2025), and Taslim and Handayani (2025), who report a significant effect. Our compilation of affiliate locations offers one reading of this null result. Of the 36 sampled firms, 21 have affiliates in Malaysia (11 firms) or Japan (10 firms), whose statutory corporate rates of 24% and 23.2% exceed Indonesia's 22%, and 17 firms have affiliates in jurisdictions with rates of 25–30%, such as the Philippines, China, New Zealand, and Australia. Counting each firm–jurisdiction pair, 40 pairs fall in jurisdictions with rates at or below 22% and 45 above it. Where affiliates sit in jurisdictions that tax at similar or higher rates, moving profit abroad does not lower the group's tax bill, so related-party dealings can be driven by operational rather than fiscal motives. The 18 firms with Singapore affiliates (17% rate) may be motivated by legal clarity and stability as much as by rates. This reading fits the monitoring side of agency theory: documentation requirements and the arm's length rules in Regulation No. 172 of 2023 raise the cost of aggressive pricing and narrow managers' scope for opportunism (Putra & Rahayu, 2023). Two measurement caveats apply. The proxy includes domestic related-party receivables, and some firms report zero receivables because they settle through letters of credit or telegraphic transfers, so TP may understate true related-party activity.

2. Leverage

Leverage has a positive and significant effect on tax avoidance, and it is the only variable whose effect remains significant under robust inference. The result supports the tax shield logic: the higher the leverage, the stronger the indication of avoidance through interest expense. Mean DER fell during 2022–2025 (0.58, 0.51, 0.49, and 0.48, declines of 12.38%, 2.18%, and 2.33%), which may reflect an effort to build a funding structure dominated by equity. Interest expense, however, rose: average interest expense was Rp429.93 billion in 2022, Rp485.11 billion in 2023 (+12.83%), Rp541.09 billion in 2024 (+11.52%), and Rp543.27 billion in 2025 (+0.4%). We read this either as a fall in non-interest-bearing liabilities (trade payables, accruals, provisions, tax payable, employee benefit obligations) rather than in bank or bond debt, or as new borrowing at higher interest rates. Mean ETR also declined (23.0%, 22.2%, 22.1%, and 21.6%), consistent with a fall in average tax expense over the period. The result is in line with Rani et al. (2025), Christina et al. (2024), and Sholihah and Rahmiati (2024), who report significant leverage effects, and differs from Wijaya and Suparmun (2023), Poernomo and D (2025), and Taslim and Handayani (2025), who find no effect.

In agency terms, managers (agents) may use debt opportunistically to minimize the tax burden for the benefit of shareholders (principals). Even though DER declined, managers may deliberately take new debt at higher interest rates or higher funding cost, so that real interest expense keeps rising. The resulting tax shield erodes profit before

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tax and pushes ETR down during the observation period. Managers choose this strategy because the tax protection from financing cost maximizes net income and mitigates agency conflict with investors, even though it harms the government as tax authority. The finding is also conditional on outlier screening, as Table 6 shows.

3. Tax treaty

The treaty dummy takes the value 2 for one observation only. To our knowledge, no earlier quantitative study tests the direct effect of tax treaties on avoidance, so the result cannot be benchmarked against prior estimates. The negative and significant coefficient is in line with H3. The comparison, however, rests on a single non-treaty firm-year (ETR 13.7%) against the average of the other 106 and must be read with caution. Its clustered standard error is degenerate and its significance disappears under HC3 errors ($p = 0.123$). In the full sample, which adds three further observations of the same firm, significance depends on the estimator ($p = 0.064$ under OLS, 0.029 under HC3). All sample firms except one have affiliates in treaty partner jurisdictions, so the dummy hardly discriminates between firms. Our compilation also indicates that the average ETR of firms with foreign investments stays above the treaty withholding rates of the destination countries and mostly above Indonesia's 22% statutory rate, reaching 29.03%, so treaty rates do not appear to have been used to lower the overall tax burden aggressively.

We therefore find that treaty exposure is associated with less, not more, tax avoidance, although the evidence is not robust to alternative standard errors. This is compatible with institutional features that limit treaty abuse: claiming treaty rates requires a certificate of domicile and proof of beneficial ownership; relief applies mainly to passive income such as dividends, interest, and royalties, whereas ETR is dominated by business profits; the MLI's Principal Purpose Test targets treaty shopping (Kurniawan & Rahayu, 2022); and information exchange clauses raise detection risk. In agency terms, these features raise the expected cost of opportunism. A convincing test needs continuous measures, such as treaty withholding-rate differentials by jurisdiction or the share of foreign income routed through conduit entities.

4. Implications

For tax authorities, supervision of treaty use and compliance with transfer pricing documentation should be maintained, since both appear to limit avoidance in this sample; monitoring of debt funding schemes should also be strengthened, especially the reasonableness of interest rates, to mitigate base erosion from the interest tax shield. For managers, funding policy should be evaluated carefully so that rising interest expense does not trigger aggressive audits because of a sharp fall in ETR, while compliance in

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treaty use and transfer pricing documentation should be maintained to avoid sanctions. For researchers, the results show that conclusions drawn from avoidance proxies can hinge on outlier treatment and on the standard error estimator, that a binary treaty dummy is inadequate when nearly all firms sit inside the treaty network, and that analysis should examine interest expense in the income statement and not only balance sheet ratios.

CONCLUSION

This study tested whether transfer pricing intensity, leverage, and tax treaty exposure explain tax avoidance, measured by ETR, in 107 firm-years of 32 industrials and basic materials firms listed on the IDX in 2022–2025. The three variables are jointly significant but explain only 10.8% of ETR variation. Transfer pricing has no significant effect (H1 not supported). Leverage has a positive and significant effect on tax avoidance, consistent with the tax shield prediction (H2 supported), and the result holds under HC3 and firm-clustered standard errors. Tax treaty exposure has a negative and significant effect on tax avoidance under conventional standard errors (H3 supported), but this result is driven by a single non-treaty observation and loses significance under robust errors. In this sector, debt appears to be used as a channel for tax avoidance through interest expense, whereas treaty exposure appears to restrain rather than facilitate avoidance.

Several limitations qualify these conclusions. The transfer pricing proxy mixes domestic and foreign related-party receivables and misses firms that settle through letters of credit. Only consolidated statements were used, without data on the related parties. The treaty dummy is almost constant. Removing 26% of observations was needed to satisfy normality, and the results are not significant in the full sample. The panel covers four years and one sector, and ETR is a single proxy. Autocorrelation was judged with the −2 to +2 criterion, and stricter table-based Durbin–Watson bounds could flag mild serial correlation in a panel of repeated firms. Future research could add cash ETR or book-tax differences, use interest coverage alongside DER, build continuous treaty measures, estimate firm and year effects over longer panels, and test corporate governance as a moderator of the debt–avoidance link.

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APPENDIX A. Sample Firms and Outlier Observations (1.5 × IQR Rule)

No.	Firm	Code	Outlier observations removed	Observations retained
1	ANTAM (Persero) Tbk	ANTM	0	4
2	Arita Prima Indonesia Tbk	APII	3	1
3	Asahimas Flat Glass Tbk	AMFG	1	3
4	Astra International Tbk	ASII	0	4
5	Ateliers Mecaniques D'Indonesie Tbk	AMIN	3	1
6	Bakrie & Brothers Tbk	BNBR	3	1
7	Barito Pacific Tbk	BRPT	4	0
8	Bumi Resources Minerals Tbk	BRMS	1	3
9	Champion Pacific Indonesia Tbk	IGAR	0	4
10	Colorpak Indonesia Tbk	CLPI	1	3
11	Ekadharma International Tbk	EKAD	0	4
12	ESSA Industries Indonesia Tbk	ESSA	0	4
13	Hexindo Adiperkasa Tbk	HEXA	2	2
14	Ifishdeco Tbk	IFSH	0	4
15	Impack Pratama Industri Tbk	IMPC	0	4
16	Indah Kiat Pulp & Paper Tbk	INKP	0	4
17	Indocement Tunggal Prakarsa Tbk	INTP	0	4
18	Indonesia Fibreboard Industry Tbk	IFII	0	4
19	Indopoly Swakarsa Industry Tbk	IPOL	3	1
20	Jembo Cable Company Tbk	JECC	4	0
21	Lautan Luas Tbk	LTLS	0	4
22	Mark Dynamics Indonesia Tbk	MARK	0	4
23	MNC Asia Holding Tbk	BHIT	0	4
24	Multifiling Mitra Indonesia Tbk	MFMI	4	0
25	Pabrik Kertas Tjiwi Kimia Tbk	TKIM	4	0
26	Panca Budi Idaman Tbk	PBID	0	4
27	Semen Indonesia (Persero) Tbk	SMGR	2	2
28	Solusi Bangun Indonesia Tbk	SMCB	0	4
29	Sumi Indo Kabel Tbk	IKBI	0	4
30	Suparma Tbk	SPMA	0	4

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No.	Firm	Code	Outlier observations removed	Observations retained
31	Surya Toto Indonesia Tbk	TOTO	0	4
32	Tembaga Mulia Semanan Tbk	TBMS	0	4
33	Unggul Indah Cahaya Tbk	UNIC	0	4
34	United Tractors Tbk	UNTR	0	4
35	Vale Indonesia Tbk	INCO	0	4
36	Wijaya Karya Beton Tbk	WTON	2	2
	Total		**37**	**107**

Source: Authors' compilation from IDX data (2026).

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