

# Research Horizon

ISSN: 2808-0696 (p), 2807-9531 (e)

## Research Horizon

Volume: 05

Issue: 04

Year: 2025

Page: 1695-1706

## Citation:

Tamam, B., & Tarmidi, D. (2025). The effect of transfer pricing, capital intensity, and leverage on tax avoidance with company size as a moderating variable. *Research Horizon*, 5(4), 1695-1706.

## Article History:

Received: July 30, 2025

Revised: August 25, 2025

Accepted: August 28, 2025

Online since: August 31, 2025

## The Effect of Transfer Pricing, Capital Intensity, and Leverage on Tax Avoidance with Company Size as a Moderating Variable

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## Abstract

The complexity of business transactions in Indonesia's mining sector has raised concerns about tax avoidance, which reduces state revenue through legal loopholes. This study aims to analyze the impact of transfer pricing, capital intensity, and leverage on tax avoidance, with company size as a moderating variable, in mining companies listed on the Indonesia Stock Exchange from 2019 to 2023. The research employs a quantitative approach using panel data regression with data from 16 companies, resulting in 80 observations. Tax avoidance is measured by the ratio of tax expenses to pre-tax profits, transfer pricing by related party transactions to total sales, capital intensity by fixed assets to total assets, leverage by total debt to total assets, and company size by the natural logarithm of total assets. The findings indicate that transfer pricing and leverage significantly influence tax avoidance, while capital intensity and company size as a moderating variable do not. These results suggest that mining companies use profit shifting and debt financing to minimize tax obligations. This study contributes to understanding tax avoidance practices and offers recommendations for policymakers to enhance regulations, particularly on transfer pricing and debt-related deductions, to ensure fairer tax contributions in the mining sector.

## Keywords

Capital Intensity, Company Size, Leverage, Mining Sector, Tax Avoidance, Transfer Pricing.

## 1. Introduction

The rapid growth of companies in Indonesia has led to increasingly complex business activities and financial transactions, significantly contributing to state revenue, particularly through taxation. Taxes play a strategic role in national development, financing critical sectors such as infrastructure, education, health, civil servant salaries, and public facilities. Moreover, taxes serve as an essential component of economic policy to foster growth and stability in a country (Nur'aini & Sherlita, 2023). However, the complexity of these transactions, particularly in the mining sector, has raised concerns about practices that undermine tax compliance, such as tax avoidance, which exploits legal loopholes to minimize tax obligations (Pohan, 2016; Napitupulu et al., 2020). This issue is particularly pronounced in industries with high cross-border transactions and significant fixed asset ownership, such as mining, which contributes substantially to Indonesia's economy (Sadeva et al., 2020).

Despite the critical role of taxes, tax obligations are often not welcomed by taxpayers due to their binding legal nature and lack of direct compensation. This situation encourages companies to engage in tax avoidance strategies, which, while legal, reduce state revenue and create inequities among compliant businesses (Napitupulu et al., 2020). A prominent example is the case of PT Adaro and its Singapore-based subsidiary, Coaltrade Services International Pt. Ltd, which engaged in transfer pricing by selling coal at below-market prices to reduce reported profits in Indonesia, resulting in a state revenue loss of up to US\$125 million between 2009 and 2017 (Detikfinance, 2019). Such practices highlight the need to examine factors like transfer pricing, capital intensity, and leverage, which may facilitate tax avoidance, particularly in the mining sector, where multinational operations and high fixed asset investments create opportunities for profit shifting (Bangun, 2023; Tarmidi et al., 2023). These factors, combined with the moderating role of company size, warrant further investigation to understand their impact on tax avoidance practices (Dewi & Noviri, 2017).

Previous studies on tax avoidance have shown inconsistent findings, indicating a clear research gap that this study aims to address. According to Nibras and Hadinata (2020), capital intensity and leverage have varying effects on tax avoidance, with some studies finding no significant impact, while others report positive or negative effects. Similarly, Alam (2019) found that leverage influences tax avoidance, but its significance depends on industry context, whereas Faizah (2022) reported a negative relationship in certain sectors. Dewi and Noviri (2017) and Oktamawati (2017) highlighted inconsistencies in the moderating role of company size, with large companies sometimes showing greater tax planning capabilities but also facing stricter regulatory scrutiny. These inconsistencies suggest that the relationships between transfer pricing, capital intensity, leverage, and tax avoidance, as well as the moderating effect of company size, remain underexplored in the specific context of Indonesia's mining sector (Andini et al., 2021; Darsani & Sukartha, 2021; Anissa Pujiwaty & Machdar, 2023). Furthermore, few studies have integrated these variables in a single model within the mining industry, which is characterized by unique operational and financial structures (Gazali et al., 2020; Kalbuana et al., 2020).

This study aims to investigate the impact of transfer pricing, capital intensity, and leverage on tax avoidance, with company size as a moderating variable, focusing on mining companies listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. The mining sector was chosen due to its high fixed asset utilization, involvement in international transactions, and significant contribution to state revenue. By addressing the research gap regarding the inconsistent effects of these variables and their interactions in the mining industry, this study seeks to provide a comprehensive understanding of tax avoidance practices. It is expected that the

findings will contribute to the accounting and taxation literature by clarifying the role of these factors and offer practical recommendations for policymakers to design more effective tax regulations, particularly in monitoring transfer pricing and managing corporate tax burdens. Ultimately, this research aims to promote fairer taxation practices and enhance state revenue collection in Indonesia's mining sector.

## **2. Literature Review and Hypothesis Development**

### **2.1. Agency Theory and its Relevance to Tax Avoidance**

The theoretical foundation of this study is rooted in agency theory, as proposed by Jensen and Meckling (2000), which elucidates the relationship between principals (capital owners) and agents (company managers). According to Jensen and Meckling (2000), agency conflicts arise when managers prioritize personal interests over those of shareholders, often leading to practices like tax avoidance that maximize reported profits while minimizing tax obligations (Pohan, 2016). In the context of this study, tax avoidance represents a strategy where managers exploit legal loopholes to reduce tax burdens, aligning with agency theory's premise of conflicting interests between managers and stakeholders, including the government seeking optimal tax revenue (Napitupulu et al., 2020). This conflict is particularly evident in the mining sector, where complex transactions and multinational operations create opportunities for tax planning (Tarmidi et al., 2023).

Tax avoidance, measured through the Effective Tax Rate (ETR) as the ratio of tax expenses to pre-tax profits, is a common indicator reflecting such practices (Salehi et al., 2020). By leveraging agency theory, this study examines how transfer pricing, capital intensity, and leverage influence tax avoidance, with company size as a moderating variable, in the context of mining companies listed on the IDX (Sadeva et al., 2020; Mukarramah & Nugroho, 2025). The theory provides a robust framework to understand how managerial decisions in these areas may prioritize short-term gains over long-term fiscal compliance, impacting state revenue and creating inequities among businesses (Maisaroh & Setiawan, 2021).

### **2.2. Transfer Pricing, Capital Intensity, Leverage, and Tax Avoidance**

The first variable, transfer pricing, involves setting transaction prices between related parties, often used to shift profits to jurisdictions with lower tax rates, thereby reducing tax obligations. According to Napitupulu et al. (2020), transfer pricing is a prevalent strategy in multinational companies, particularly in the mining sector, where cross-border transactions are common (Devita & Sholikhah, 2021; Bangun, 2023). This practice aligns with agency theory, as managers may use transfer pricing to minimize taxes, benefiting shareholders but reducing state revenue (Panjulusman et al., 2018).

The second variable, capital intensity, reflects the proportion of fixed assets to total assets, enabling companies to reduce taxable income through depreciation expenses. Kalbuana et al. (2020) and Maharani and Merkusiwati (2021) argue that high capital intensity in mining companies, driven by investments in machinery and infrastructure, facilitates tax avoidance by leveraging depreciation deductions. However, some studies, such as Nibras and Hadinata (2020), found no significant effect, indicating variability in its impact. The third variable, leverage, represents the use of debt in a company's capital structure, with interest expenses deductible from taxable income. Noviyani and Muid (2019) suggest that higher leverage increases opportunities for tax avoidance due to larger interest deductions, though results vary across industries (Alam, 2019; Faizah, 2022). Based on these findings, this study proposes the following hypotheses:

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

H2: Capital intensity has a positive effect on tax avoidance.

H3: Leverage has a positive effect on tax avoidance.

### 2.3. Moderating Role of Company Size

Company size, as a moderating variable, influences the relationship between transfer pricing, capital intensity, leverage, and tax avoidance. According to Dewi and Noviari (2017), larger companies possess greater resources and expertise for sophisticated tax planning, potentially amplifying the effects of transfer pricing on tax avoidance (Oktamawati, 2017; Andini et al., 2021). Large firms often engage in complex transactions with affiliates, leveraging international networks to optimize tax strategies (Suntari, 2020; Putranto et al., 2023). However, they also face greater regulatory scrutiny, which may limit aggressive tax avoidance (Fitria, 2018; Mulyani et al., 2018).

In the context of capital intensity, Dewi and Merkusiwati (2023) suggest that larger companies can better utilize depreciation benefits to reduce taxable income, though this effect is inconsistent across studies (Safitri & Muid, 2020; Farida et al., 2021). Similarly, leverage's impact on tax avoidance may be moderated by company size, as larger firms can negotiate better debt terms, increasing interest deductions (Apriatna & Oktris, 2022; Safitri & Oktris, 2023). However, Oktavia et al. (2020) found that company size does not always strengthen these relationships, highlighting a research gap in the mining sector (Nailufaroh et al., 2022; Triyanto & Tarmidi, 2024). Thus, this study proposes the following hypotheses:

H4: Company size moderates transfer pricing on tax avoidance.

H5: Company size moderates capital intensity on tax avoidance.

H6: Company size moderates leverage on tax avoidance.

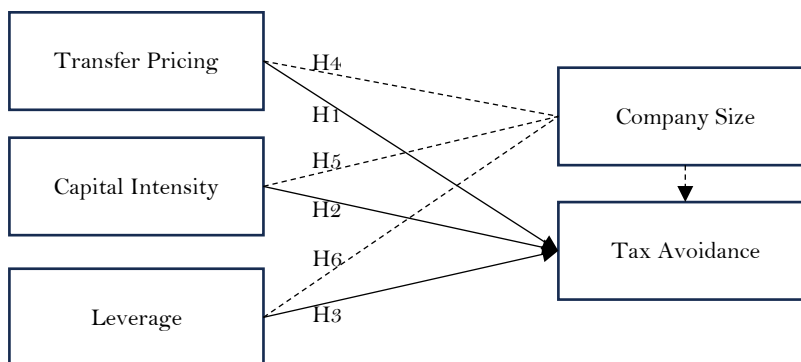


Figure 1. Research Framework

The research framework integrates agency theory with the relationships between transfer pricing, capital intensity, leverage, company size, and tax avoidance. According to Sadeva et al. (2020), the framework posits that transfer pricing, capital intensity, and leverage directly influence tax avoidance by enabling profit shifting, depreciation deductions, and interest expense reductions, respectively (Irianto et al., 2017; Ramadhan et al., 2021). Company size moderates these relationships by enhancing the capacity for tax planning in larger firms (Pradnyadevi & Suardikha, 2020). This framework is particularly relevant to the mining sector, where multinational operations and high fixed asset investments create unique tax avoidance opportunities (Zoebar & Miftah, 2020; Darsani & Sukartha, 2021). The framework, illustrated in Figure 1, depicts transfer pricing, capital intensity, and leverage as independent variables, tax avoidance as the dependent variable, and company size as the moderating variable. This model builds on prior studies by integrating these variables in the context of Indonesian mining companies, addressing inconsistencies in previous findings (Setyaningsih & Wulandari, 2021;

Mailia & Apollo, 2020). The framework guides the empirical analysis to test hypotheses H1–H6, providing insights into tax avoidance practices and their policy implications (Susanto & Widya, 2022; Wulandari et al., 2024).

### **3. Methods**

This study adopts a quantitative approach to investigate the impact of transfer pricing, capital intensity, and leverage on tax avoidance, with company size as a moderating variable, focusing on mining companies listed on the IDX from 2019 to 2023. The research utilizes panel data regression to analyze the relationships between variables, leveraging the longitudinal nature of the data to capture variations across time and entities (Sugiono, 2017). The choice of the mining sector is driven by its high fixed asset utilization and involvement in international transactions, which are conducive to tax avoidance practices.

The population consists of all mining companies listed on the IDX during the study period. Using purposive sampling, 16 companies were selected based on specific criteria: they must be consistently listed on the IDX from 2019 to 2023 and have complete financial reports available. This selection process resulted in 80 observations (16 companies over 5 years). Data were sourced from annual financial statements and related party transaction disclosures obtained from the IDX database and company websites. The dependent variable, tax avoidance, is measured using the ETR, calculated as tax expenses divided by pre-tax profits. Transfer pricing is proxied by the ratio of related party transactions to total sales, capital intensity by the ratio of fixed assets to total assets, leverage by the ratio of total debt to total assets, and company size by the natural logarithm of total assets.

The analysis employs panel data regression with three models, namely the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM), to determine the most suitable approach. The Fixed Effect Model was selected based on the results of the Chow and Hausman tests, which indicated its appropriateness for this dataset. The regression model incorporates interaction terms to test the moderating effect of company size on the relationships between transfer pricing, capital intensity, leverage, and tax avoidance. Classical assumption tests, including multicollinearity and heteroscedasticity tests, were conducted to ensure the model's validity. The analysis was performed using statistical software to estimate the regression coefficients and test the hypotheses, providing robust and reliable results.

### **4. Results**

This study examines the impact of transfer pricing, capital intensity, and leverage on tax avoidance, with company size as a moderating variable, in mining companies listed on the IDX from 2019 to 2023. The analysis is based on a quantitative approach using panel data regression, with data collected from 16 companies, resulting in 80 observations. The results presented here include descriptive statistical analysis, model selection tests, classical assumption tests, simultaneous and partial hypothesis tests, and moderated regression analysis, providing insights into the relationships between the variables and tax avoidance practices in the mining sector.

The variables analyzed in this study are defined as follows: Tax avoidance (Y), the dependent variable, is measured using the ETR, calculated as tax expenses divided by pre-tax profits, where a lower ETR indicates higher tax avoidance. Transfer pricing (X1) is proxied by the ratio of related party transactions to total sales, reflecting the extent of affiliate transactions that may facilitate profit shifting. Capital intensity (X2) is measured as the ratio of fixed assets to total assets, capturing the potential for depreciation deductions to reduce taxable income.

Leverage (X3) is defined as the ratio of total debt to total assets, indicating the use of debt financing that generates tax-deductible interest expenses. Company size (Z), the moderating variable, is measured as the natural logarithm of total assets, representing the scale and resources of the company. These definitions provide a foundation for interpreting the descriptive statistics and regression results presented in this section.

**Table 1.** Descriptive Statistical Analysis

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
Tax Avoidance	-0.000572	-0.001508	0.194878	-0.456224	0.129780
Transfer Pricing	3.116613	0.865103	44.02052	0.071013	6.713166
Capital Intensity	0.689567	0.513305	1.854581	0.003811	0.512035
Leverage	0.426005	0.461735	0.843823	0.029250	0.173909
Company Size	29.58486	29.84371	31.75034	27.06711	1.114465

The descriptive statistical analysis is shown in Table 1. Descriptive Statistical Analysis provides an overview of the variables’ characteristics, including minimum, maximum, mean, median, and standard deviation. The Transfer Pricing variable (X1) has a minimum value of 0.071013 at PT AKR Corpindo Tbk in 2022 and a maximum value of 44.02052 at PT Astrindo Nusantara Infrastruktur Tbk in 2020. This significant variation indicates heterogeneity in related party transactions among mining companies, with some maintaining consistent practices while others exhibit volatility. The Capital Intensity variable (X2) recorded a minimum value of 0.003811 at PT Energi Mega Persada Tbk in 2020 and a maximum value of 1.854581 at PT IMC Pelita Logistik Tbk in 2020, reflecting the sector’s heavy reliance on fixed assets like mining machinery and infrastructure. The Leverage variable (X3) ranged from a minimum of 0.02925 at PT Mitrabara Adiperdana Tbk in 2023 to a maximum of 0.843823 at PT Energi Mega Persada Tbk in 2019, suggesting diverse financing strategies, with some companies adopting cautious debt policies and others pursuing aggressive expansion through borrowing. The Tax Avoidance variable (Y) shows a minimum ETR of -0.456224 at PT Energi Mega Persada Tbk in 2019, likely due to fiscal loss carryforwards, and a maximum of 0.194878 at PT Batulicin Nusantara Maritim Tbk, possibly driven by significant profit declines during the period, raising suspicions of tax avoidance practices. The Company Size variable (Z) ranges from 27.06711 at PT Batulicin Nusantara Maritim Tbk to 31.75034 at PT Bayan Resources Tbk, indicating relatively comparable scales among sampled companies despite some variation. The mean value of tax avoidance being smaller than its standard deviation underscores significant differences in tax avoidance practices across firms.

The descriptive statistics in Table 1 highlight the variability in the data, particularly for transfer pricing and tax avoidance, which show high standard deviations relative to their means. This suggests diverse practices among mining companies, with some engaging in aggressive tax planning or affiliate transactions. The relatively stable distribution of capital intensity and company size indicates consistency in fixed asset investments and firm scales, while leverage shows moderate variation, reflecting different debt strategies. These findings provide a basis for the regression analysis, which tests the hypothesized relationships between the variables.

**Table 2.** Model Test Analysis

Test	Comparison	Criteria	Prob	Most Appropriate Model
Chow	FEM vs CEM	Prob Test < 0.05	0.0000	FEM
Hausman	FEM vs REM	Prob Test < 0.05	0.0007	FEM
LM*	REM vs CEM	--	--	FEM

\*) The Lagrange Multiplier (LM) test was not performed because the FEM was selected based on the Chow and Hausman tests.

Panel data regression analysis was conducted using three approaches: the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). As shown in Table 2. Model Test Analysis, the Chow test, and the Hausman test all confirmed that the Fixed Effect Model (FEM) is the most appropriate for this dataset, with probability values of 0.0000 and 0.0007, respectively, both below the 0.05 threshold. The FEM accounts for unobserved heterogeneity across companies, making it suitable for analyzing the mining sector's unique characteristics. The regression equation derived from the FEM indicates that transfer pricing, capital intensity, leverage, and company size collectively influence tax avoidance. Classical assumption tests confirmed that the model is free from multicollinearity and heteroscedasticity, ensuring its validity for hypothesis testing.

**Table 3.** Simultaneous Test Results (F)

Statistics	Value
F-Statistic	11.58751
Prob. F-Statistic	0.000000

The model suitability test is presented in Table 3. Simultaneous Test Results (F) show an F-statistic probability value of 0.000000, which is less than 0.05, indicating that the regression model is suitable for explaining variations in tax avoidance.

**Table 4.** Determination Coefficient Results

Statistics	Value
R-Squared	0.785839
Adjusted R-Squared	0.718021

Table 4 shows the determination Coefficient results, which reveal an Adjusted R-squared value of 0.718021, meaning that 71.80% of the variation in tax avoidance is explained by transfer pricing, capital intensity, leverage, and company size, while factors outside this study influence the remaining 28.20%. These results confirm the robustness of the model in capturing the relationships between the variables.

**Table 5.** Partial Test Results (t)

Independent Variables	Criteria	Test Results	Description
Transfer Pricing	Prob Test < 0.05	Prob = 0.0007	Influential
Capital Intensity	Prob Test < 0.05	Prob = 0.4205	Not Influential
Leverage	Prob Test < 0.05	Prob = 0.0170	Influential

The partial hypothesis tests are shown in Table 5. Partial Test Results (t), indicate that transfer pricing has a significant effect on tax avoidance with a probability value of 0.0007, below the 0.05 threshold, confirming that related party transactions are strongly associated with tax avoidance practices. Leverage also has a significant effect, with a probability value of 0.0170, suggesting that higher debt levels influence tax avoidance, likely due to deductible interest expenses. Conversely, capital intensity does not significantly affect tax avoidance, with a probability value of 0.4205, greater than 0.05, indicating that fixed asset investments are not a primary driver of tax avoidance in this context.

**Table 6.** Results of Moderated Regression Analysis

Independent Variables	Moderating Variable	Criteria	Results
Transfer Pricing	Company Size	Prob Test < 0.05	Prob = 0.6257
Capital Intensity	Company Size	Prob Test < 0.05	Prob = 0.3261
Leverage	Company Size	Prob Test < 0.05	Prob = 0.8137

The moderated regression analysis is presented in Table 6. Results of moderated regression analysis show that company size does not moderate the effects of transfer pricing, capital intensity, or leverage on tax avoidance, as all interaction probability values exceed 0.05 (0.6257 for transfer pricing, 0.3261 for capital intensity, and 0.8137 for leverage). This suggests that company size does not strengthen or weaken the relationships between the independent variables and tax avoidance. Overall, the findings indicate that tax avoidance in mining companies is primarily driven by transfer pricing and leverage, while capital intensity and company size have limited impact. These results provide insights into the factors influencing tax avoidance practices and their implications for fiscal policy in the mining sector.

## 5. Discussion

The findings of this study confirm that transfer pricing significantly influences tax avoidance in mining companies listed on the IDX from 2019 to 2023, aligning with agency theory, which posits that managers may prioritize shareholder interests by minimizing tax obligations through strategic transactions. According to Napitupulu et al. (2020), transfer pricing facilitates profit shifting to lower-tax jurisdictions, a practice prevalent in the mining sector due to its multinational operations. The significant positive effect of transfer pricing on tax avoidance, as indicated by a lower ETR, suggests that mining companies leverage related party transactions to reduce taxable income. This finding is consistent with the case of PT Adaro, where underpriced coal sales to a Singapore-based subsidiary led to substantial tax losses. The result supports the hypothesis (H1) and corroborates prior studies, such as Ramadhan et al. (2021), which highlight transfer pricing as a key tax avoidance strategy in industries with high cross-border transactions. The prevalence of such practices underscores the need for stricter oversight of affiliate transactions in the mining sector.

The analysis reveals that capital intensity does not significantly affect tax avoidance, contrary to the hypothesis (H2). According to Maharani and Merkusiwati (2021), high capital intensity, characterized by substantial fixed asset investments, should enable tax avoidance through depreciation deductions, yet this study finds no significant impact. This lack of significance may be attributed to the mining sector's unique characteristics, where depreciation schedules are heavily regulated, limiting opportunities for aggressive tax planning. The finding aligns with Nibras and Hadinata (2020), who noted inconsistent effects of capital intensity across industries, suggesting that sector-specific factors, such as regulatory constraints or asset types, may moderate its impact. This result indicates that mining companies rely less on fixed asset strategies for tax avoidance compared to other mechanisms, highlighting the need for further exploration of sector-specific tax planning practices.

Leverage, however, significantly influences tax avoidance, supporting hypothesis (H3). According to Noviyani and Muid (2019), higher debt levels increase tax-deductible interest expenses, thereby reducing taxable income. This finding is particularly relevant in the mining sector, where companies often rely on debt to finance large-scale operations. The significant effect of leverage suggests that mining firms strategically use debt to optimize tax outcomes, aligning with agency theory's premise of managerial decisions prioritizing shareholder value. This result is consistent with Alam (2019), who found that leverage facilitates tax avoidance in capital-intensive industries. However, the reliance on debt-based tax strategies raises concerns about financial risk, as excessive borrowing could undermine long-term stability.

The study finds that company size does not moderate the relationships between transfer pricing, capital intensity, leverage, and tax avoidance, rejecting hypotheses H4, H5, and H6. According to Dewi and Noviari (2017), larger firms are expected to

have greater resources for tax planning, yet this study suggests that regulatory scrutiny in the mining sector may limit such advantages. This finding contrasts with Andini et al. (2021), who reported that company size enhances tax avoidance in other sectors, indicating that the mining industry's unique regulatory environment may suppress the moderating effect. The lack of moderation suggests that both large and small mining firms face similar constraints in leveraging transfer pricing, capital intensity, or leverage for tax avoidance.

The implications of these findings are significant for policymakers and tax authorities. The significant influence of transfer pricing and leverage on tax avoidance highlights the need for enhanced monitoring of related party transactions and debt financing practices in the mining sector. Tax authorities should strengthen regulations on transfer pricing to prevent profit shifting, potentially adopting guidelines aligned with OECD standards. Additionally, imposing limits on interest deductions could curb leverage-based tax avoidance, ensuring fairer tax contributions.

## **6. Conclusion**

This study confirms that transfer pricing and leverage significantly influence tax avoidance in mining companies listed on the IDX from 2019 to 2023, while capital intensity and company size as a moderating variable do not have a significant impact. The significant effect of transfer pricing highlights its role as a strategic tool for profit shifting, reducing taxable income through related party transactions. Similarly, leverage enables tax avoidance by generating tax-deductible interest expenses, reflecting the mining sector's reliance on debt financing. However, the insignificant effect of capital intensity suggests that depreciation-based tax strategies are less effective in this sector, possibly due to regulatory constraints on fixed asset deductions. The lack of a moderating effect from company size indicates that both large and small mining firms face similar opportunities and constraints in tax avoidance practices.

The findings offer important implications for tax authorities and policymakers, emphasizing the need for stricter oversight of transfer pricing and debt financing practices to curb tax avoidance in the mining sector. Enhanced regulations, such as aligning transfer pricing guidelines with international standards or limiting interest deductions, could ensure fairer tax contributions. However, this study is limited by its focus on only 16 mining companies and the 2019–2023 period, which was influenced by the COVID-19 pandemic, potentially affecting tax avoidance patterns. The exclusion of other variables, such as corporate governance or executive incentives, also restricts the scope of the analysis. Future research should explore these additional factors, extend the sample to other industries, or examine longer time periods to provide a more comprehensive understanding of tax avoidance dynamics.

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### ***Acknowledgment***

We gratefully acknowledge the contributions of individuals who supported the completion of this article.

### ***Funding Information***

This research did not receive any funding.

### ***Conflict of Interest Statement***

The authors declare that there is no conflict of interest.

### ***Ethical Approval and Originality Statement***

Ethical approval was obtained for this study. The manuscript represents original work and has not been previously published, nor is it under consideration by another journal.

### ***Data Disclosure Statement***

The data that support the findings of this study are available from the corresponding author upon reasonable request.



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