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Analysis of Factors Influencing Tax Avoidance in Energy Sector Companies Listed on the Indonesia Stock Exchange

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ABSTRACT
Tax avoidance in the energy sector has become a pressing issue due to its substantial impact on state revenues and the public's trust in the tax system. In Indonesia, this concern is heightened by the sector's strategic role in the national economy and its frequent involvement in aggressive tax planning practices, which, while legal, often undermine the spirit of tax regulations. This study investigates the factors influencing tax avoidance practices in companies operating within the energy sector and listed on the Indonesia Stock Exchange. The research focuses on three independent variables: company risk, capital intensity, and sales growth. Employing a quantitative associative method, the study utilizes secondary data collected from annual financial reports and applies panel data regression analysis using statistical software. The sampling was conducted through a purposive approach to ensure relevance and data consistency. The findings reveal that, collectively, the three variables have a significant impact on tax avoidance. However, on an individual basis, company risk and sales growth do not show a significant effect, whereas capital intensity demonstrates a significant negative influence on tax avoidance behavior. These results suggest that investment in fixed assets plays a vital role in reducing tax burdens legally. This research provides empirical evidence supporting the relevance of financial structure in understanding corporate tax planning within a regulated environment.

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INTRODUCTION

Tax revenues have long been recognized as a fundamental source of financing for a nation's development agenda. In Indonesia, taxation contributes the largest portion to state revenues, significantly surpassing other sectors (Lewis, 2019). Despite this, the country still faces a substantial gap between tax targets and actual collection, reflecting the persistent challenges in taxpayer compliance. The government has responded with various reforms, most notably the enactment of Law No. 7 of 2021 on Harmonization of Tax Regulations, aiming to enhance transparency, equity, and efficiency in the tax system. However, even with regulatory efforts, tax avoidance remains a critical obstacle. Companies, particularly large corporations, often

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exploit legal loopholes to minimize their tax liabilities. These strategies may be technically legal, but they undermine the spirit of the tax laws and result in significant losses to the state. According to data from the Ministry of Finance, estimated losses from tax avoidance practices in 2020 alone reached Rp 67.6 trillion, a figure that underscores the urgency of addressing this issue.

In the Indonesian context, the energy sector is often under scrutiny for aggressive tax planning. Cases such as PT Adaro Energy Tbk and PT Perusahaan Gas Negara (PGAS) highlight the sophisticated methods some corporations use to reduce tax obligations, including transfer pricing and differing interpretations of tax regulations (Baharuddin Saga and MM, 2024; Soewarsono and SE, 2024). While these actions may not violate the letter of the law, they raise ethical concerns and highlight the tension between corporate profit motives and national tax interests.

Tax avoidance, by definition, involves deliberate arrangements within the bounds of existing tax laws to reduce payable taxes. It differs from tax evasion, which is illegal. Nonetheless, the cumulative effect of widespread tax avoidance erodes public trust and diminishes the state's capacity to finance public services (Salamah, 2018). Understanding the determinants of tax avoidance is therefore essential in shaping effective tax policy and compliance strategies (Azmi and Daud, 2024).

Agency theory offers a useful lens to examine this phenomenon. Jensen and Meckling (1976) emphasize the conflict of interest between principals (shareholders) and agents (managers), where agents may engage in tax avoidance to maximize reported profits and, consequently, their compensation. This behavior, while rational from a managerial perspective, may contradict broader corporate responsibilities toward the state and society (Safitri and Oktaviani, 2022).

In practice, several firm-level factors have been associated with tax avoidance behaviors. Among them, company risk, capital intensity, and sales growth are often examined. Each represents a different dimension of the firm's operations, risk captures uncertainty and volatility; capital intensity reflects the investment in fixed assets; and sales growth signals business expansion and profitability potential.

Company risk may influence tax strategies as firms facing higher uncertainty might pursue tax avoidance to cushion potential losses or instability (Faramitha, Husen and Anhar, 2020). On the other hand, capital intensity is associated with depreciation expenses that reduce taxable income, thus making firms with substantial fixed assets more inclined toward legitimate tax minimization (Sundari and Aprilina, 2017). Meanwhile, sales growth might increase tax liabilities due to higher reported profits, potentially motivating firms to seek tax relief strategies (Wahyuni and Wahyudi, 2021)

Despite these theoretical propositions, empirical evidence on the relationship between these factors and tax avoidance remains inconclusive. Some studies report significant associations, while others find minimal or no effect. These mixed findings indicate the need for further investigation, especially in the context of emerging markets like Indonesia where regulatory frameworks and enforcement mechanisms continue to evolve.

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This study aims to fill that gap by examining how company risk, capital intensity, and sales growth influence tax avoidance in energy sector firms listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. The focus on the energy sector is particularly relevant given its strategic role in the national economy and its frequent entanglement in tax controversies. By shedding light on the drivers of tax avoidance in this sector, this research seeks to contribute both theoretically and practically to the discourse on responsible corporate taxation. Ultimately, the findings of this study are expected to offer valuable insights for policymakers, tax authorities, and corporate stakeholders. A clearer understanding of the factors that drive tax avoidance can help shape more effective tax policies and corporate governance practices, ensuring that tax contributions align with both legal standards and ethical expectations.

METHODS

This study employed a quantitative approach with an associative research design to examine the influence of company risk, capital intensity, and sales growth on tax avoidance among energy sector companies listed on the Indonesia Stock Exchange (IDX) during the period 2019 to 2023. This design was chosen to empirically test the hypothesized relationships among variables using measurable data and statistical tools, particularly panel data regression techniques.

The data used in this study are secondary, sourced from published annual reports and financial statements obtained from the official website of the IDX (www.idx.co.id) and the individual websites of the sampled companies. Secondary data were selected because they provide rich, longitudinal, and verifiable financial information essential for performing quantitative analysis in corporate taxation studies.

Purposive sampling was applied to ensure data integrity and relevance, with inclusion criteria as follows: (1) the company is classified under the energy sector on the IDX; (2) complete annual reports were published for the consecutive years 2019–2023; and (3) net income was reported in each of the five years. Out of 89 companies initially identified, 18 met the inclusion criteria. After removing outliers, the final sample comprised 12 companies, resulting in 60 firm-year observations.

Tax avoidance (dependent variable) was measured using the Effective Tax Rate (ETR), calculated by dividing income tax expense by earnings before tax, where a lower ETR indicates higher tax avoidance. This measure is widely used in prior studies for its simplicity and ability to reflect the actual tax burden on corporate earnings (Safira, Sodik and Wahyudi, 2024).

Table 1. Operationalization of variables

Variable	Definition	Indicator Measurement	Scale	Source
Company Risk	The level of business risk faced by the company, reflecting uncertainty in generating profits.	Ratio of Earnings Before Tax (EBT) to Total Assets.	Ratio	(Abdillah, 2020)

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Variable	Definition	Indicator Measurement	Scale	Source
Capital Intensity	The proportion of a company's investment in fixed assets relative to total assets.	Ratio of Net Fixed Assets to Total Assets.	Ratio	(Suryarini, Hajawiyah and Munawaroh, 2021)
Sales Growth	The rate of increase in company sales revenue from one year to the next.	(Sales in current year – Sales in previous year) / Sales in previous year × 100%.	Ratio	(Setiyanto and Nurzilla, 2019)

Panel data regression analysis was conducted using EViews 12 software. Three estimation models—Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM)—were tested. The Chow Test, Hausman Test, and Lagrange Multiplier Test were performed to determine the best-fitting model. The CEM was ultimately chosen because the LM test results showed no significant improvement from using REM, and the dataset exhibited relatively homogeneous characteristics across companies in terms of sector, regulatory framework, and operational scope. This homogeneity reduces the likelihood of unobserved individual effects influencing the dependent variable, making the CEM more efficient and parsimonious for estimation without sacrificing explanatory power (Wahyu Winarno, 2015).

To ensure robustness, classical assumption tests were conducted, including normality (Jarque-Bera), multicollinearity (correlation matrix), heteroscedasticity (Glejser), and autocorrelation (Durbin-Watson). All tests confirmed that the data met the assumptions required for valid regression analysis, allowing for reliable hypothesis testing.

RESULTS AND DISCUSSION

Overview of the Research Object

This study was conducted on companies listed on the Indonesia Stock Exchange (IDX) during the 2019–2023 period. The data used were sourced from annual reports, which were obtained through the official IDX website (www.idx.co.id) and the respective company websites.

Description of Research Sample

The purpose of this study is to examine the factors influencing tax avoidance and the extent of their impact. The research population includes energy sector companies listed on the IDX from 2019 to 2023. The sampling technique employed was purposive sampling, based on specific selection criteria.

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Table 1. Sample Criteria

No	Sample Criteria	Remaining Companies	Excluded Companies	Cumulative Exclusion
1	Energy sector companies listed on the Indonesia Stock Exchange (2019–2023)	89	–	–
2	Companies that published annual reports consistently from 2019 to 2023	52	37	37
3	Companies that reported net income for each year from 2019 to 2023	19	18	55
	Total Selected Sample			18
	Outlier Data			6
	Final Sample After Removing Outliers			12
	Observation Period (Years)			5
	Total Observations			60

Based on Table 1, it can be concluded that out of 89 energy sector companies identified as the population, only 18 met the sampling criteria. However, due to the presence of outliers, 6 companies were excluded, resulting in a final sample of 12 companies. The list of companies that met the research criteria is presented in Table 1.

Table 2. List of Selected Companies

No	Code	Company Name
1	AKRA	PT. AKR Corporindo Tbk
2	BSSR	PT. Baramulti Suksessarana Tbk
3	ELSA	PT. Elnusa Tbk
4	GEMS	PT. Golden Energy Mines Tbk
5	MBAP	PT. Mitrabara Adiperdana Tbk
6	MYOH	PT. Samindo Resources Tbk
7	PTBA	PT. Bukit Asam Tbk
8	PTRO	PT. Petrosea Tbk
9	SHIP	PT. Sillo Maritime Perdana Tbk
10	SOCI	PT. Soechi Lines Tbk
11	TOBA	PT. TBS Energi Utama Tbk
12	TPMA	PT. Trans Power Marine Tbk

Table 2 presents the list of 12 energy sector companies selected as the final research sample after applying the specified criteria and removing outliers. These companies were consistently listed on the Indonesia Stock Exchange (IDX) during the 2019–2023 period, published annual reports each year, and reported positive net income throughout the observation period. The selected companies include both upstream and downstream energy firms, representing a diverse segment of the industry. This composition ensures that the study captures a broad view of tax avoidance practices across various business models within the energy sector in Indonesia.

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Descriptive Statistics

According to Sugiyono (2019), descriptive statistics is a technique used to analyze data by describing the collected information without drawing general conclusions. The purpose of this analysis is to provide a summary of the data in terms of minimum, maximum, mean, standard deviation, and number of observations. It systematically presents actual conditions related to the phenomena being studied. The results of the descriptive statistics analysis are shown as follows.

Table 3. Descriptive Statistics

Statistic	TA	RP	CI	SG
Mean	0.205596	0.177529	0.343011	0.129614
Median	0.221543	0.099917	0.234972	0.058206
Maximum	0.406792	0.795947	0.853338	1.110067
Minimum	0.038985	0.012281	0.028253	-0.501514
Std. Dev.	0.078710	0.196356	0.280728	0.320133
Skewness	0.118095	1.870175	0.814040	0.769354
Kurtosis	3.278569	5.549765	2.105.713	3.507970
Jarque-Bera	0.333467	5.122880	8.625.980	6.564140
Probability	0.846425	0.000000	0.013393	0.037550
Sum	1.233575	1.065174	2.058.068	7.776867
Sum Sq. Dev.	0.365519	2.274792	4.649686	6.046609
Observations	60	60	60	60

Explanation of Descriptive Statistics

1. The descriptive analysis in Table 3 shows a total of 60 observations. The tax avoidance variable (Y) has a minimum value of 0.038985 (PTMA, 2023) and a maximum of 0.406792 (ELSA, 2021), with an average of 0.205596 and a standard deviation of 0.078710. Since the standard deviation is lower than the mean, the data is well-distributed.
2. The company risk variable (X1) ranges from 0.012281 (SOCI, 2021) to 0.795947 (GEMS, 2022), with a mean of 0.177529 and a standard deviation of 0.196356. Because the standard deviation exceeds the mean, the distribution is considered biased.
3. The capital intensity variable (X2) ranges from 0.028253 (TOBA, 2022) to 0.853338 (SHIP, 2019), with a mean of 0.343011 and a standard deviation of 0.280728. As the standard deviation is lower than the mean, the data is well-distributed.
4. The sales growth variable (X3) shows a minimum of -0.501514 (MBAP, 2023) and a maximum of 1.110067 (BSSR, 2021), with an average of 0.129614 and a standard deviation of 0.320133, indicating a good distribution.

Panel Data Regression Model Testing

Panel data regression was conducted using three estimation models: the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Each model has its advantages and limitations. The choice of model depends on the research assumptions and whether the statistical requirements are met, ensuring valid and accountable results. The first step is to identify the most suitable model to evaluate the quality and consistency of the data.

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Common Effect Model (CEM)

The Common Effect Model combines time series and cross-sectional data using the Ordinary Least Squares (OLS) method for estimation (Fairuz, 2017). The results of the CEM analysis are presented in the following table.

Table 4. Results of the Common Effect Model (CEM) Test

Dependent Variable	TA
Method	Panel Least Squares
Date	01/03/2025
Time	16:19
Sample	2019–2023
Periods included	5
Cross-sections included	12
Total panel (balanced) observations	60

Variable	Coefficients	Std. Error	t-Statistik	Prob.
C	0.250476	0.020965	1.194759	0.0000
RP	0.024510	0.061127	0.400977	0.6900
CI	-0.123803	0.037083	-3.338562	0.0015
SG	-0.052199	0.033722	-1.547894	0.1273
R-squared	0.241787	Mean dependent var	0.205596	
Adjusted R-squared	0.201168	S.D. dependent var	0.078710	
S.E. of regression	0.070349	Akaike info criterion	-2.406361	
Sum squared resid	0.277141	Schwarz criterion	-2.266738	
Log likelihood	7.619.084	Hannan-Quinn criterion	-2.351747	
F-statistic	5.952.623	Durbin-Watson stat	1.856420	
Prob(F-statistic)	0.001347			

Based on Table 4, the Common Effect Model shows a constant value of 0.250476. The regression coefficient for Company Risk (X1) is 0.024510, indicating a positive relationship. Meanwhile, Capital Intensity (X2) has a coefficient of –0.123803, and Sales Growth (X3) has a coefficient of –0.052199, both showing negative relationships with tax avoidance.

Fixed Effect Model (FEM)

To estimate panel data, the Fixed Effect Model uses dummy variables to capture differences across companies (Sari, 2018). This model assumes that regression coefficients remain constant across time and firms. The approach, known as Least Square Dummy Variables (LSDV), is useful for controlling individual heterogeneity in panel data analysis. The results of the FEM estimation are presented in the following table.

Table 5. Results of the Fixed Effect Model (FEM) Test

Dependent Variable	TA			
Method	Panel Least Squares			
Date	01/03/2025			
Time	16:20			
Sample	2019–2023			
Periods included	5			
Cross-sections included	12			
Total panel (balanced) observations	60			
Variable	Coefficients	Std. Error	t-Statistic	Prob.
C	0.219194	0.067756	3.235.033	0.0023
RP	-0.149170	0.082973	-1.797809	0.0789
CI	0.036901	0.183622	0.200960	0.8416
SG	0.001748	0.034691	0.050382	0.9600
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.531192	Mean dependent var	0.205596	
Adjusted R-squared	0.385341	S.D. dependent var	0.078710	
S.E. of regression	0.061709	Akaike info criterion	-2.520466	
Sum squared resid	0.171358	Schwarz criterion	-1.996.880	
Log likelihood	9.061399	Hannan-Quinn criterion	-2.315663	
F-statistic	3.642014	Durbin-Watson stat	2.580778	
Prob(F-statistic)	0.000479			

Based on Table 5, the Fixed Effect Model has a constant value of 0.219194. The regression coefficient for Company Risk (X1) is –0.149170, indicating a negative relationship.

Capital Intensity (X2) has a coefficient of 0.036901, and Sales Growth (X3) has a coefficient of 0.001748, both suggesting positive but weak associations with tax avoidance.

Random Effect Model (REM)

This model estimates panel data under the assumption that regression coefficients are constant, while the intercepts vary across individuals and over time (random effects) (Sari, 2018). The results of the Random Effect Model (REM) test are presented in the following table.

Table 6. Results of the Random Effect Model (REM) Test

Dependent Variable	TA			
Method	Panel EGLS (Cross-section random effects)			
Date	01/03/2025			
Time	16:21			
Sample	2019–2023			
Periods included	5			
Cross-sections included	12			
Total panel (balanced) observations	60			
Estimator of component variances	Swamy and Arora			
Variable	Coefficients	Std. Error	t-Statistik	Prob.
C	0.262834	0.024952	1.053.356	0.0000
RP	-0.036880	0.065136	-0.566198	0.5735
CI	-0.134544	0.046430	-2.897.773	0.0054
SG	-0.035037	0.031438	-1.114.478	0.2698
Effect	S.D.	Rho		
Cross-section random	0.030934	0.2008		
Idiosyncratic random	0.061709	0.7992		
Weighted Statistics				
R-squared	0.156296	Mean dependent var	0.136868	
Adjusted R-squared	0.111097	S.D. dependent var	0.067599	
S.E. of regression	0.063733	Sum squared resid	0.227467	
F-statistic	3.457.988	Durbin-Watson stat	2.148.638	
Prob(F-statistic)	0.022286			

Unweighted Statistics	
R-squared	0.227522
Sum squared resid	0.282356
Mean dependent var	0.205596
Durbin-Watson stat	1.730.951

Based on Table 6, the Random Effect Model yields a constant value of 0.262834. The regression coefficient for Company Risk (X1) is –0.036880, for Capital Intensity (X2) is 0.134544, and for Sales Growth (X3) is –0.035037, indicating mixed directional influences on tax avoidance.

Selection of the Panel Data Regression Model

To determine the most appropriate panel data regression model, several statistical tests were conducted. These include the Chow Test, Hausman Test, and Lagrange Multiplier (LM) Test, each serving as a reference based on specific model characteristics.

Chow Test

The Chow Test is used to decide between the Common Effect Model (CEM) and the Fixed Effect Model (FEM). The test hypotheses are as follows:

a. If the chi-square probability < 0.05, the Fixed Effect Model (FEM) is selected.
b. If the chi-square probability > 0.05, the Common Effect Model (CEM) is selected.

Table 7. Results of the Chow Test

Redundant Fixed Effects Tests (Equation: FEM)

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.525409	(11, 45)	0.0142
Cross-section Chi-square	28.846311	11	0.0024

Based on Table 7, the probability value for the Cross-section Chi-Square is 0.0024, which is less than 0.05 at a 5% significance level. Therefore, the Fixed Effect Model (FEM) is selected. As a follow-up, the Hausman Test is conducted to determine whether the FEM or the Random Effect Model (REM) is more appropriate.

Hausman Test

The Hausman Test is a statistical procedure used to decide between the Fixed Effect Model (FEM) and the Random Effect Model (REM) for panel data estimation. The hypotheses are as follows:

a. If the cross-section probability < 0.05, select the Fixed Effect Model (FEM).
b. If the cross-section probability > 0.05, select the Random Effect Model (REM).

Table 8. Results of the Hausman Test

Correlated Random Effects – Hausman Test
(Equation: REM)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.7344 86	3	0.0809
Cross-section random effects test comparisons:			

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Variable	Fixed	Random	Var(Diff.)	Prob.
RP	-0.149170	-0.036880	0.002642	0.0289
CI	0.036901	-0.134544	0.031561	0.3345
SG	0.001748	-0.035037	0.000215	0.0121

Based on Table 8, the probability value for the cross-section random is 0.0809, which is greater than 0.05. Therefore, the appropriate model is the Random Effect Model (REM). Consequently, the analysis must proceed to the Lagrange Multiplier (LM) Test to determine the most suitable model between REM and CEM.

Lagrange Multiplier (LM) Test

The Lagrange Multiplier Test is used to decide whether the Random Effect Model (REM) or the Common Effect Model (CEM) is more appropriate. This test uses the Breusch-Pagan method with the following decision rules:

a. If the Cross-section Breusch-Pagan value > 0.05, then the Common Effect Model (CEM) is preferred.
b. If the Cross-section Breusch-Pagan value < 0.05, then the Random Effect Model (REM) is preferred.

Table 9. Results of the Lagrange Multiplier Test

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

Test Hypothesis	Cross-section	Time	Both
Breusch-Pagan	1.848590 (0.1739)	0.204183 (0.6514)	2.052773 (0.1519)

Based on Table 9, the probability value for the Breusch-Pagan cross-section is 0.1739, which is greater than 0.05. Therefore, the appropriate model is the Common Effect Model (CEM).

Table 10. Summary of Panel Data Regression Model Selection

No	Test Name	Selected Model
1	Chow Test	Fixed Effect Model (FEM)
2	Hausman Test	Random Effect Model (REM)
3	Lagrange Multiplier	Common Effect Model (CEM)

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Based on the comparison of the three panel data regression models, different results were obtained from each test. Therefore, the Common Effect Model (CEM) is concluded to be the most appropriate model for this study.

Normality Test

The normality test aims to assess whether the residuals are normally distributed. This study uses the Jarque-Bera test to examine normality. According to Ghozali and Ratmono (2018), if the Jarque-Bera probability value > 0.05, the data is considered to be normally distributed.

To meet this assumption, six companies were excluded based on outlier criteria. The results of the normality test are presented in the following figure.

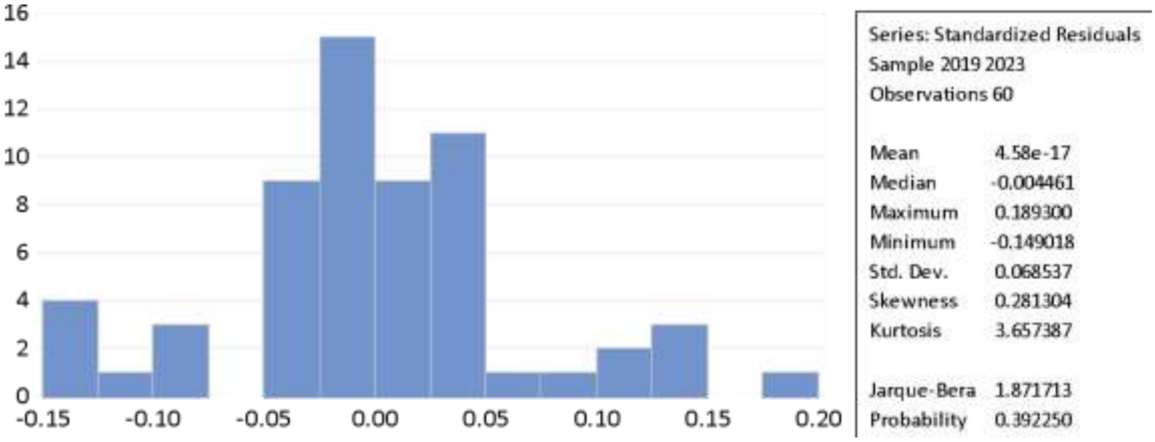

Figure 1. Results of the Normality Test

Based on Figure 1, the Jarque-Bera probability value is 0.392250, which is greater than the significance level of 0.05. Therefore, it can be concluded that the data is normally distributed, and the model satisfies the normality assumption, allowing the analysis to proceed to the next test.

Multicollinearity Test

The multicollinearity test is used to determine whether there is a high correlation among the independent variables. According to Ismanto and Pebruary (2021), multicollinearity does not exist if the correlation between variables is less than 0.90.

a. If the correlation between independent variables is greater than 0.90, multicollinearity exists.
b. If the correlation is less than 0.90, there is no multicollinearity in the model.

Table 11. Results of the Multicollinearity Test

	RP	CI	SG
RP	1.000000	-0.441349	0.501257
CI	-0.441349	1.000000	-0.068369
SG	0.501257	-0.068369	1.000000

Berdasarkan gambar 4.11 dimana Uji multikolinearitas memiliki hasil pengujian terhadap nilai koefisien korelasi dari masing-masing variabel independen, Risiko Perusahaan (X1), Capital Intensity (X2), dan Sales Growth (X3) tidak mengalami korelasi yang lebih besar

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dari 0.90, sehingga dapat ditarik kesimpulan bahwa pada penelitian ini tidak mengalami Multikolinearitas.

Uji Heteroskedastisitas

Uji heteroskedastisitas bertujuan menguji apakah dalam model regresi terjadi ketidaksamaan varian dari residual satu pengamatan ke pengamatan yang lain Ghozali (2017). Penelitian ini menggunakan metode Glajser dengan ketentuan sebagai berikut:

a. Jika nilai probabilitas Chi-squared > 0.05, maka tidak terjadi masalah heteroskedastisitas.
b. Jika nilai probabilitas Chi-squared < 0.05, maka terjadi masalah heteroskedastisitas.

Hasil dari Uji Heteroskedastisitas pada penelitian ini dapat dilihat pada tabel berikut:

Table 12. Results of the Heteroscedasticity Test

Heteroskedasticity Test: White		
Null hypothesis: Homoskedasticity		
Test	Statistics	Prob.
F-statistic	1.389952	0.2179
Obs*R-squared	1.200735	0.2129
Scaled explained SS	1.389778	0.1260

Based on Table 12, the Probability Chi-Square value is 0.2129, which is greater than 0.05. Therefore, it can be concluded that there is no indication of heteroscedasticity in this model.

Autocorrelation Test

To detect the presence of autocorrelation, the Durbin-Watson test is used. A good regression model should be free from autocorrelation. The interpretation criteria are as follows:

a. If DW < -2, positive autocorrelation exists.
b. If DW is between -2 and +2, no autocorrelation is present.
c. If DW > +2, negative autocorrelation exists.

The results of the Durbin-Watson test are shown in the following table.

Table 13. Results of the Autocorrelation Test

Dependent Variable	TA			
Method	Panel Least Squares			
Date	01/03/2025			
Time	16:43			
Sample	2019–2023			
Periods Included	5			
Cross-sections Included	12			
Total Panel (Balanced) Observations	60			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.250476	0.020965	1.194759	0.0000
RP	0.024510	0.061127	0.400977	0.6900

CI	-0.123803	0.037083	-3.338562	0.0015
SG	-0.052199	0.033722	-1.547894	0.1273
R-squared	0.241787	Mean dependent var	0.205596	
Adjusted R-squared	0.201168	S.D. dependent var	0.078710	
S.E. of regression	0.070349	Akaike info criterion	-2.406361	
Sum squared resid	0.277141	Schwarz criterion	-2.266738	
Log likelihood	7.619.084	Hannan-Quinn criterion	-2.351747	
F-statistic	5.952623	Durbin-Watson stat	1.856420	
Prob(F-statistic)	0.001347			

Based on Table 13, the Durbin-Watson (D-W) statistic is 1.856420, which falls between –2 and +2. This indicates that no autocorrelation is present in the model.

Results of Panel Data Regression Analysis

Multiple linear regression analysis was conducted to examine the influence of the independent variables—company risk, capital intensity, and sales growth—on the dependent variable, tax avoidance. The analysis used the Common Effect Model (CEM), and the results are presented as follows.

Table 14. Results of Panel Data Testing Using the Common Effect Model (CEM)

Dependent Variable	TA
Method	Panel Least Squares
Date	01/03/2025
Time	16:19
Sample	2019–2023
Periods included	5
Cross-sections included	12
Total panel (balanced) observations	60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.250476	0.020965	1.194.759	0.0000
RP	0.024510	0.061127	0.400977	0.6900
CI	-0.123803	0.037083	-3.338562	0.0015
SG	-0.052199	0.033722	-1.547894	0.1273

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Based on the results shown in Figure 14, the multiple linear regression analysis tests the relationship between independent variables and the dependent variable. The resulting regression equation is:

Y = 0.250476 + 0.024510(X1) – 0.123803(X2) – 0.052199(X3) + e

Interpretation of the regression equation:

1. The constant value of 0.250476 indicates that if all independent variables are zero, tax avoidance is predicted to be 0.250476.
2. The coefficient of Company Risk (X1) is 0.024510, meaning a one-unit increase in company risk leads to a 0.024510 increase in tax avoidance.
3. The coefficient of Capital Intensity (X2) is –0.123803, indicating that a one-unit increase in capital intensity decreases tax avoidance by 0.123803.
4. The coefficient of Sales Growth (X3) is –0.052199, meaning a one-unit increase in sales growth results in a 0.052199 decrease in tax avoidance.

Results of the Coefficient of Determination (R^2)

The coefficient of determination (R^2) measures how well the model explains the variation in the dependent variable. An R^2 value close to 0 indicates that the independent variables explain only a small portion of the variance in the dependent variable, while a value close to 1 means they provide nearly all the information needed to predict the dependent variable (Ghozali, 2018). The results of the R^2 test are presented below.

Table 15. Results of the Coefficient of Determination (R^2)

Statistic	Value	Statistic	Value
R-squared	0.241787	Mean dependent var	0.205596
Adjusted R-squared	0.201168	S.D. dependent var	0.078710
S.E. of regression	0.070349	Akaike info criterion	-2.406361
Sum squared resid	0.277141	Schwarz criterion	-2.266738
Log likelihood	7.619084	Hannan-Quinn criter.	-2.351747
F-statistic	5.952623	Durbin-Watson stat	1.856420
Prob(F-statistic)	0.001347		

Based on Figure 15, the Adjusted R-squared value is 0.201168, which indicates that the independent variables—Company Risk, Capital Intensity, and Sales Growth—collectively explain 20.11% of the variation in Tax Avoidance. The remaining 79.89% is influenced by other variables not included in this model, which may stem from both internal and external factors.

Results of the Partial Significance Test (t-test)

The t-test is used to examine the effect of each independent variable on the dependent variable individually (partially). The significance level is assessed using the probability value, where:

a.If p-value < 0.05, the variable is considered to have a significant effect.
b.If p-value > 0.05, the variable is considered to have no significant effect.

Table 16. Results of the Partial Significance Test (t-test)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.250476	0.020965	1.194.759	0.0000

RP	0.024510	0.061127	0.400977	0.6900
CI	-0.123803	0.037083	-3.338.562	0.0015
SG	-0.052199	0.033722	-1.547.894	0.1273

Based on Table 16, the t-test results for each independent variable are as follows:

a. Company Risk (X1) has a probability value of 0.6900 (> 0.05), indicating that it does not have a significant effect on Tax Avoidance.
b. Capital Intensity (X2) has a probability value of 0.0015 (< 0.05), meaning it has a significant effect on Tax Avoidance.
c. Sales Growth (X3) has a probability value of 0.1273 (> 0.05), indicating it does not have a significant effect on Tax Avoidance.

Results of Simultaneous Significance Test (F-test)

The F-test is used to determine whether all independent variables in the model simultaneously affect the dependent variable (Ghozali, 2016:96). If the probability value < 0.05, the model is considered statistically significant. Otherwise, if probability > 0.05, the model is not significant. The next section will present the results of the F-test applied in this study. Based on Table 15, the F-statistic probability value is 0.001347, which is less than 0.05. This indicates that the independent variables jointly have a significant effect on the dependent variable, Tax Avoidance.

Discussion

1. The Effect of Company Risk on Tax Avoidance
   The study found a probability value of 0.6900 for the Company Risk variable, which is greater than 0.05, indicating no significant effect on tax avoidance. This suggests that risk-averse executives tend to avoid risky decisions, and therefore tax avoidance behavior is more likely influenced by factors such as tax policy, regulations, and internal company strategies. This finding aligns with Rahmi (2020), who also found no relationship between company risk and tax avoidance.
2. The Effect of Capital Intensity on Tax Avoidance
   The probability value for Capital Intensity is 0.0015, which is less than 0.05, indicating a significant effect on tax avoidance. Depreciation expenses that are deductible reduce taxable income, thereby decreasing the tax owed. This supports agency theory, which suggests alignment between shareholders and managers in maximizing the utility of fixed assets. The result is consistent with Sinaga (2021), who noted that fixed asset ownership reduces tax due to depreciation benefits.
3. The Effect of Sales Growth on Tax Avoidance
   Sales Growth has a probability value of 0.1273 (> 0.05), indicating no significant effect on tax avoidance. This may be due to companies earning income from sources other than sales, such as investments, rent, or dividends. Thus, tax strategies may focus more on those income types. These results are consistent with Pamungkas & Mildawati (2020), who argued that although sales growth might increase profits, it also raises tax obligations and fiscal oversight, neutralizing its influence on tax avoidance.

4. Simultaneous Effect of Company Risk, Capital Intensity, and Sales Growth on Tax Avoidance

   The F-test result shows a significance level of 0.001347, which is less than 0.05, meaning the three independent variables jointly have a significant impact on tax avoidance. This supports agency theory, where conflicts between managers (agents) and shareholders (principals) may lead to financial reporting strategies, including tax avoidance, driven by differing interests. This finding is supported by Safitri & Oktaviani (2022).

CONCLUSION

This study examined the influence of company risk, capital intensity, and sales growth on tax avoidance in manufacturing firms listed on the Indonesia Stock Exchange and found that capital intensity significantly affects tax avoidance, suggesting that companies with higher investment in fixed assets tend to implement tax-saving strategies through depreciation deductions, while company risk and sales growth do not have a significant effect, indicating that risk-averse management may avoid aggressive tax strategies and that revenue growth alone may not necessarily lead to increased tax planning due to reliance on other income sources; collectively, the three variables significantly influence tax avoidance, supporting the agency theory perspective on potential conflicts between management and shareholders, and highlighting the importance of capital structure and asset management in shaping corporate tax policies, with the results offering valuable insights for regulators, tax authorities, and corporate leaders in formulating strategies that encourage compliance without compromising efficiency, and suggesting that future research should consider additional variables such as managerial incentives, corporate governance mechanisms, and the impact of regulatory changes to provide a broader understanding of corporate tax behavior.

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