Profitability, Leverage, Corporate Social Responsibility, and Institutional Ownership: Determinants of Tax Aggressiveness in the Indonesian Capital Market, 2020–2023

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ABSTRACT

Tax aggressiveness has emerged as a strategic concern due to its potential to erode state revenues through corporate practices aimed at minimizing tax obligations, whether by lawful tax planning or through more opaque, potentially unlawful strategies. This study examines the influence of profitability, leverage, corporate social responsibility (CSR), and institutional ownership on tax aggressiveness among firms in the basic and chemical industries listed on the Indonesia Stock Exchange (IDX) over the 2020–2023 period. Drawing on panel data from 132 firms, the analysis employs panel regression techniques to identify the relationships among these variables. The findings indicate that profitability, CSR, and leverage are significantly associated with tax aggressiveness, whereas institutional ownership does not exhibit a statistically significant effect.

Keywords: Tax Aggressiveness; Profitability; Leverage; Institutional Ownership

Pengaruh Profitabilitas, Leverage, Tanggung Jawab Sosial Perusahaan, dan Kepemilikan Institusional terhadap Agresivitas Pajak

ABSTRAK

Agresivitas pajak merupakan isu strategis yang menjadi sorotan karena berpotensi mengurangi penerimaan negara melalui berbagai upaya perusahaan dalam menekan beban pajaknya, baik melalui mekanisme legal maupun ilegal Penelitian ini dilakukan untuk menganalisis pengaruh profitabilitas, leverage, corporate social responsibility (CSR), dan kepemilikan institusional terhadap agresivitas pajak pada perusahaan sektor industri dasar dan kimia di BEI periode 2020–2023. Data diperoleh dari 132 perusahaan melalui purposive sampling dan dianalisis menggunakan regresi data panel. Hasil menunjukkan bahwa profitabilitas dan CSR berpengaruh negatif signifikan, leverage berpengaruh positif signifikan, dan kepemilikan institusional tidak berpengaruh signifikan terhadap agresivitas pajak.

Kata Kunci: Agresivitas Pajak; Profitabilitas; Leverage; Kepemilikan Institusional

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INTRODUCTION

The sustained growth of Indonesia's national economy has been accompanied by the expansion of the domestic business sector. However, this progress has also highlighted persistent tensions between fiscal authorities and corporate taxpayers, particularly in the fulfilment of tax obligations. From the corporate perspective, taxation is often perceived as a financial burden that directly reduces net profits. This perception encourages firms to engage in tax planning strategies—both legal and borderline practices—to reduce their tax liabilities. Such behaviour contributes to a measurable decline in state revenues, which serve as a critical funding source for national development (Ramadani & Hartiyah, 2020). According to The State of Tax Justice 2020, Indonesia incurred tax revenue losses amounting to IDR 68.7 trillion due to tax avoidance practices.

Low corporate tax compliance is widely attributed to this profit-eroding perception of taxation (Cheng et al., 2022). As a result, companies are increasingly adopting aggressive tax planning strategies that extend beyond legitimate business purposes. Darussalam (2022) defines tax aggressiveness as a systematic form of tax planning that seeks to minimise tax liabilities through the exploitation of transactions unrelated to genuine operational objectives. While these firms may formally comply with tax regulations, they often utilise complex structures aimed at reducing tax payments, thereby undermining potential state revenue.

One notable macroeconomic indicator of tax aggressiveness is Indonesia's persistently low tax-to-GDP ratio relative to its ASEAN counterparts. Despite ongoing efforts to improve tax administration, the tax ratio stood at just 9.11% in 2021 and only marginally increased to 10.21% by 2023, according to data from the Ministry of Finance and the OECD. This underperformance highlights the inefficiencies in the country's fiscal mobilisation and reflects the limited contribution of the tax sector to state finances. Contributing to this shortfall is the low level of corporate tax compliance, whereby firms exploit aggressive tax strategies that, while not in direct violation of the law, are inconsistent with the spirit of taxation (Simorangkir et al., 2018).

Evidence of tax aggressiveness is further demonstrated by several high-profile cases involving major corporations. For instance, PT Coca-Cola Indonesia was found to have significantly inflated advertising expenses, reducing its taxable income. Similarly, PT Toyota Motor Manufacturing Indonesia was suspected of engaging in transfer pricing with affiliated foreign entities, while PT Rajawali Nusantara Indonesia reportedly used intra-group loan arrangements to lower its tax obligations. These cases underscore deficiencies in fiscal oversight and compliance, highlighting the need for substantive reforms to improve fairness, transparency, and effectiveness in Indonesia's tax system.

The case of PT Coca-Cola Indonesia is particularly illustrative. The Directorate General of Taxes uncovered that between 2002 and 2006, the company reported advertising expenses amounting to IDR 566.84 billion. This inflated reporting resulted in a discrepancy between the company's declared taxable income of IDR 492.59 billion and the tax authority's calculation of IDR 603.48 billion, ultimately leading to a tax shortfall correction of IDR 49.24 billion (Pratama et al., 2023). This example reflects not only aggressive tax behaviour but also the

challenge of ensuring accurate corporate reporting within a complex regulatory environment.

Prior research has identified a range of internal corporate factors that may influence tax aggressiveness. These include profitability, leverage, corporate social responsibility (CSR), and institutional ownership. Profitability, typically measured by Return on Assets (ROA), reflects a firm's capacity to generate income (Sari & Rahayu, 2020). Leverage, or the extent of debt financing, is relevant given that interest expenses are tax-deductible, thereby lowering taxable income (Amalia, 2021). CSR, which encompasses ethical and sustainable practices aimed at stakeholders, is also considered influential in shaping corporate tax behaviour (Rengganis & Dwija Putri, 2018). Institutional ownership, meanwhile, is posited to strengthen governance by exerting oversight over managerial decisions, including those related to tax planning.

CSR, in particular, has gained increasing relevance in Indonesia's regulatory landscape. While voluntary for most industries, CSR is mandated in sectors such as natural resource extraction under Law No. 40 of 2007, Article 74 (Puspawati et al., 2018). Firms that demonstrate greater CSR engagement are often perceived as more accountable and less likely to engage in overly aggressive tax strategies. Conversely, firms with lower liquidity may be more inclined toward tax aggressiveness to conserve cash flow and sustain operations (Hidayat & Muliasari, 2020). Profitability also plays a nuanced role. While higher profits can translate to higher tax liabilities—thus creating an incentive for tax avoidance—well-performing firms may also have the financial capacity to meet tax obligations more readily, as evidenced by higher effective tax rates (Arta, 2022).

Despite growing interest in the determinants of tax aggressiveness, empirical findings remain inconsistent. For instance, some studies have found significant relationships between profitability and leverage and tax aggressiveness (Mustofa et al., 2021), while others have reported no such effects (Dharmayanti, 2019). Similarly, findings on the influence of CSR and institutional ownership vary across studies (Simorangkir et al., 2018). These discrepancies suggest that the impact of internal corporate factors may differ across contexts and industry settings, warranting further investigation.

To address these inconsistencies, this study aims to provide additional empirical evidence on the relationship between firm-specific characteristics and tax aggressiveness, with a particular focus on the basic and chemical industries. These sectors are of interest due to their distinctive features, including high debt-dependence, concentrated institutional ownership, and substantial CSR disclosures. As such, they provide a relevant and under-explored context for assessing the dynamics of corporate tax behaviour in Indonesia.

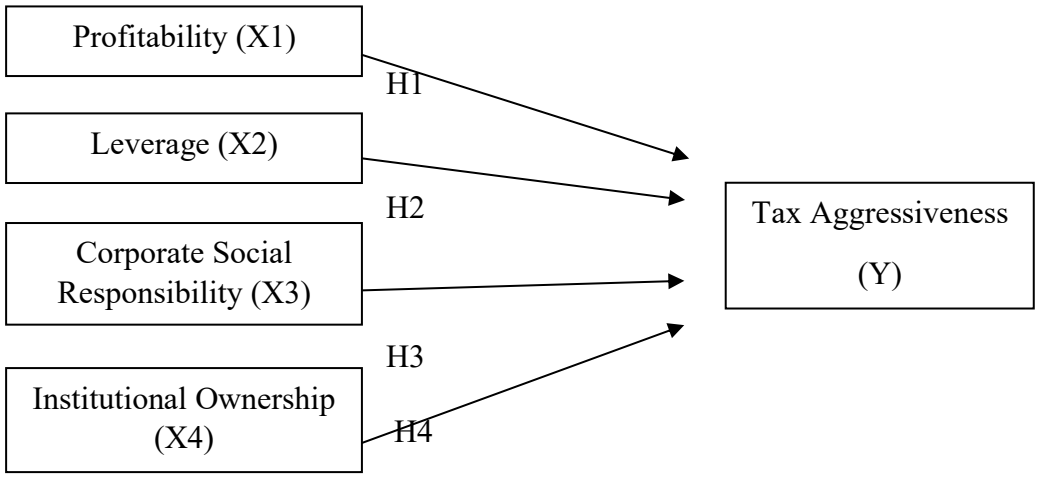

Figure 1. Research Model

Source: Research Data, 2025

Agency theory provides a conceptual framework for understanding the relationship between principals (owners) and agents (managers), particularly when divergent interests and information asymmetries give rise to agency conflicts. In the context of taxation, managers may act in their own interests or seek to meet profit targets set by principals by engaging in aggressive tax strategies, including tax avoidance, to preserve reported net income (Alfandia, 2024). As corporate tax practices attract growing scrutiny, tax disclosure has become increasingly relevant for stakeholders, particularly in public-interest entities. However, the variation in the quality and scope of tax disclosures across financial and sustainability reports has raised concerns regarding the extent to which tax reporting has been integrated into broader sustainability frameworks (Münch & Velte, 2024).

Agency theory suggests that information asymmetry between managers and shareholders may allow for opportunistic tax behaviour. Managers may prioritise personal or short-term financial interests, potentially to the detriment of firm performance. Tax avoidance, while often framed as a strategic decision, requires careful evaluation of its associated risks and benefits. Governance mechanisms—such as the board of commissioners or the inclusion of independent directors—are designed to mitigate agency problems, yet their effectiveness in curbing tax aggressiveness remains contested (Shaukat Malik et al., 2025). Within this framework, managers are accountable for achieving the firm's financial objectives, including profitability, but misaligned incentives may prompt them to pursue tax strategies that maximise reported earnings at the expense of compliance.

Profitability, as a measure of a firm's efficiency in generating earnings, is frequently associated with tax aggressiveness. From an agency theory perspective, higher profitability increases tax obligations, thereby reducing reported net income. To mitigate this, managers may engage in aggressive tax planning—exploiting fiscal loopholes without explicitly contravening legal provisions—to manage tax liabilities. Thus, firms with higher profitability may have a stronger incentive to pursue aggressive tax strategies. Empirical findings, however, remain

mixed. While Supraptiningsih and Nuridah (2022) report a positive association between profitability and tax aggressiveness, other studies, including those by Koussis et al. (2025) and Dharmayanti (2019), find no significant relationship. On this basis, the following hypothesis is proposed:

H_1: Profitability has a positive effect on tax aggressiveness.

Leverage, which reflects the extent of debt financing in a firm's capital structure, also bears relevance in the context of agency theory. Theoretically, debt can serve as a disciplinary mechanism to align managerial behaviour with shareholder interests, particularly by reducing the free cash flow available for discretionary use. For instance, Hanh Thi My (2024) finds that leverage can enhance investment efficiency in underinvestment scenarios, suggesting that debt, when properly monitored, can constrain managerial opportunism and improve resource allocation. Nevertheless, leverage also introduces new agency costs, especially in firms with high financial risk.

In tax planning, leverage offers distinct advantages, as interest expenses on debt are deductible for tax purposes, thereby lowering taxable income. This creates an incentive for firms to adopt tax-aggressive strategies as a means of reducing their effective tax burden (Noerhafizah et al., 2024). Studies by Cheng et al. (2022), Hidayat and Muliasari (2020), and Amalia (2021) support a positive association between leverage and tax aggressiveness. Conversely, research by De Meyst et al. (2024) and Sari and Rahayu (2020) suggests that the relationship is statistically insignificant. In light of these mixed findings, the second hypothesis is articulated as follows:

H_2: Leverage has a positive effect on tax aggressiveness.

Corporate Social Responsibility (CSR) refers to a firm's voluntary or mandated initiatives aimed at addressing social and environmental concerns. In Indonesia, CSR is obligatory for companies operating in sectors such as natural resource management under Law No. 40 of 2007. Although CSR is generally associated with ethical corporate behaviour, some firms may leverage CSR disclosures to bolster their reputational capital while simultaneously engaging in tax avoidance strategies. This duality has generated scholarly debate on the actual relationship between CSR and tax aggressiveness.

While some studies—such as those by Denmamode and Panchoo (2024), Simorangkir et al. (2018), and Muljadi et al. (2022)—identify a positive link between CSR engagement and tax aggressiveness, suggesting that CSR may be used to mask aggressive tax strategies, other research offers contrasting findings. For example, Amarna et al. (2025) report that CSR has a negative effect on temporary tax differences, which are often indicative of avoidance practices, while Ramadani and Hartiyah (2020) and Insani et al. (2022) observe either negative or insignificant effects. These divergent results warrant further empirical examination, leading to the following hypothesis:

H_3: Corporate social responsibility (CSR) has a positive effect on tax aggressiveness.

Institutional ownership, defined as the proportion of shares held by institutional investors, is considered a critical factor in corporate governance. Institutions typically possess both the expertise and incentive to monitor managerial actions effectively. As such, higher levels of institutional ownership

are expected to enhance oversight and constrain managerial opportunism, including decisions related to aggressive tax planning. Moreover, institutional investors often favour stable and transparent governance, which may discourage risk-laden tax strategies (University of Wah, Punjab, Pakistan et al., 2025).

Empirical findings on this relationship are generally supportive of a disciplining effect. Studies by Rengganis and Dwija Putri (2018), Fitriani et al. (2021), Zafran (2025), and Tristiyanto et al. (2024) find that institutional ownership is negatively associated with tax aggressiveness. However, Ramadani and Hartiyah (2020) find no statistically significant relationship, suggesting that institutional investors may not always exert effective influence. Given these findings, the following hypothesis is proposed:

H_4: Institutional ownership has a negative effect on tax aggressiveness.

In light of the theoretical framework and the gaps identified in the existing literature, this study aims to examine the effect of profitability, leverage, corporate social responsibility (CSR), and institutional ownership on tax aggressiveness. The analysis focuses on firms operating within the basic and chemical industries listed on the Indonesia Stock Exchange (IDX) over the period 2020–2023. This sectoral focus is motivated by its distinct structural characteristics, including high leverage levels, strong institutional ownership, and frequent CSR engagement, making it a pertinent context for investigating the determinants of tax aggressiveness.

RESEARCH METHODS

The data used in this study is quantitative and derived from secondary sources. Information was obtained from financial reports and annual reports of companies in the basic and chemical industries listed on the Indonesia Stock Exchange (IDX) for the period 2020 to 2023.

Table 1. Sampling Criteria

No	Criteria
1	Companies that are part of the basic and chemical industry sector listed on the IDX for the 2020-2023 period.
2	Companies that are part of the basic and complete chemical industry sector submit their annual reports for the 2020-2023 period.
3	Companies in the basic and chemical industry sectors that experienced profits during the 2020-2023 period
4	Companies that are part of the basic and chemical industry sectors that do not use foreign currency in their financial reports

Source: Research Data, 2025

The unit of analysis in this study comprised all firms within the basic and chemical industry sectors listed on the Indonesia Stock Exchange (IDX) during the 2020–2023 observation period. The sample was selected using purposive sampling based on specific criteria aligned with the study's objectives. To be included, companies were required to remain consistently listed in the sector throughout the observation window, submit complete annual reports for each year, report positive pre-tax profits annually, and present financial statements denominated in Indonesian Rupiah.

Purposive sampling, as applied in this study, entails the deliberate selection of observation units based on defined inclusion criteria. The basic and chemical industry sector was chosen due to its complex operational characteristics, scale-intensive production activities, and heightened sensitivity to fiscal policy, making it particularly relevant for examining tax aggressiveness. The first criterion required continuous listing in the sector throughout the 2020–2023 period. This ensured consistency in sectoral exposure and reduced the risk of structural heterogeneity.

The second criterion was the availability of complete and consecutive annual reports over the four-year period. This was essential for constructing a balanced panel dataset and ensuring robustness in longitudinal analysis. Furthermore, only firms that consistently reported positive pre-tax profits were included. This condition was imposed to ensure the reliability of the Effective Tax Rate (ETR) as a proxy for tax aggressiveness, as firms with negative earnings may produce undefined or misleading ETR values.

Additionally, only companies reporting in Indonesian Rupiah were retained in the sample to eliminate currency-related distortions and maintain consistency in the measurement of financial variables. Applying these criteria yielded a final sample of 33 firms out of a population of 132. This sample is deemed to adequately reflect the characteristics of the population and provides a reliable empirical basis for testing the proposed hypotheses.

The operational definitions and measurement of the study variables are detailed as follows. Tax aggressiveness serves as the dependent variable and is proxied by the Effective Tax Rate (ETR), calculated as the ratio of income tax expense to profit before tax. A lower ETR indicates a higher level of tax aggressiveness (Znar Nahro Ahmed, 2024; Indradi, 2018; Alvin & Harsono, 2021).

The first independent variable is profitability, which reflects the firm's capacity to generate returns from its asset base. It is measured using the Return on Assets (ROA) ratio, calculated as net income after tax divided by total assets. ROA serves as an indicator of management efficiency in utilising assets to generate earnings (Maters & Luttik, 2023; Herlinda & Rahmawati, 2021; Alvin & Harsono, 2021).

The second independent variable, leverage, captures the extent to which a firm finances its assets through debt. Leverage is measured by the ratio of total liabilities to total assets. Higher leverage implies a greater reliance on debt financing, which can reduce taxable income due to the deductibility of interest expenses, thereby influencing tax aggressiveness (Islam et al., 2023; Sari & Rahayu, 2020; Hidayat & Muliasari, 2020b).

Corporate Social Responsibility (CSR) serves as the third independent variable. CSR disclosure is quantified using a disclosure index derived from the Global Reporting Initiative (GRI-G4) framework. The CSR Disclosure Index (CSRDI) is calculated by dividing the number of CSR items disclosed in the company's annual report by the total of 91 GRI items. Each item is assigned a score of 1 if disclosed and 0 if not. A higher CSRDI indicates greater transparency and social accountability (Korada, 2023; Simorangkir et al., 2018).

The fourth independent variable is institutional ownership, defined as the proportion of a company's shares held by institutional investors such as banks,

insurance firms, and investment funds. This is calculated by dividing the number of shares held by institutions by the total number of shares outstanding. Institutional ownership is viewed as a proxy for external monitoring and may influence managerial decisions, including those related to tax planning (Ho, 2024; Fitriani et al., 2021).

The empirical analysis employed panel data regression using EViews version 13. To determine the most appropriate estimation model, three diagnostic tests were conducted: the Chow test for fixed versus pooled effects, the Hausman test for fixed versus random effects, and the Lagrange Multiplier (LM) test for random versus pooled effects. The resulting model was then estimated using a multiple linear regression equation to test the relationship between the independent variables and tax aggressiveness.

$ETR = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$.....(1)

Where:

ETR = Tax Aggressiveness (Effective Tax Rate)
X_1 = Profitability
X_2 = Leverage
X_3 = Corporate Social Responsibility
X_4 = Institutional Ownership

To ensure the validity of the regression model and its compliance with the classical linear regression assumptions, a series of diagnostic tests were conducted. These included tests for normality, multicollinearity, heteroscedasticity, and autocorrelation, in accordance with the requirements of the Best Linear Unbiased Estimator (BLUE) framework. Following this, hypothesis testing was undertaken using the t-statistic to assess the individual (partial) significance of each independent variable on the dependent variable. The F-statistic was employed to evaluate the joint (simultaneous) significance of all explanatory variables within the model. Finally, the coefficient of determination (R^2) was used to quantify the proportion of variance in the dependent variable explained by the set of independent variables, thereby offering a measure of the model's explanatory power.

RESULTS AND DISCUSSION

Table 1. Results of Descriptive Statistical Tests

	Y	X1	X2	X3	X4
Mean	0.253	0.064	0.330	0.133	0.723
Median	0.223	0.053	0.337	0.120	0.754
Maximum	2,225	0.249	0.820	0.307	1
Minimum	0.010	0.001	0.023	0.021	0.319
Observations	132	132	132	132	132

*Source:*Research Data, 2025

Descriptive statistics serve to summarise both categorical and numerical data through key statistical measures, including frequency, percentage, measures of central tendency (mean, median, mode), and measures of dispersion (range, variance, and standard deviation). These metrics provide a foundational understanding of the data's distributional characteristics, assist in identifying

patterns, and facilitate the detection of outliers or anomalies within the dataset (Green, 2023).

As presented in Table 1, the tax aggressiveness variable (Y), proxied by the Effective Tax Rate (ETR), has an average value of 0.254, with a minimum of 0.010 and a maximum of 2.225. The median value of 0.224 suggests that more than half of the sampled firms exhibit relatively low levels of tax aggressiveness, though the presence of extreme values at the upper bound indicates potential outliers. This distribution implies that while the majority of firms demonstrate moderate compliance with tax obligations, a small number engage in highly aggressive tax practices.

The profitability variable (X1), measured by Return on Assets (ROA), shows a mean of 0.065 and a median of 0.054, with values ranging from 0.001 to 0.250. The mean exceeding the median implies a right-skewed distribution, likely influenced by a subset of firms with particularly high profitability. This indicates heterogeneity in financial performance across the sample.

Leverage (X2), calculated as the ratio of total liabilities to total assets, has a mean of 0.331, a median of 0.338, and ranges from 0.023 to 0.820. These figures suggest that firms in the sample generally maintain moderate levels of debt in their capital structure, with some variation in external financing practices across firms.

The corporate social responsibility (CSR) disclosure index (X3), based on the Global Reporting Initiative framework, has a mean of 0.133 and a median of 0.121. The values range from 0.022 to 0.308, indicating a moderate level of CSR disclosure across firms, with some entities reporting relatively higher levels of transparency in their social and environmental initiatives.

Finally, the institutional ownership variable (X4) reports a mean of 0.723 and a median of 0.755, with values ranging from 0.319 to 1.000. This suggests that institutional investors hold a dominant share in many firms within the basic and chemical industries during the observation period, potentially implying a high degree of external oversight in corporate governance practices.

Table 2. Chow Test with Redundant Test

Effect Test	Statistics	df	Prob.
Cross-section F	3,295	(32.95)	0.000
Cross-section Chi-square	98,557	32	0.000

Source: Research Data, 2025

Subsequent research has extended the standard Chow test to address its limitations in the presence of heteroscedasticity and autocorrelated residuals. Sun and Wang (2019) introduced an asymptotically distributed F-test that remains valid even when classical assumptions are violated, offering a more robust approach to testing structural stability. Similarly, Nielsen and Whitby (2015) proposed a joint Chow test capable of detecting parameter instability without requiring predefined breakpoints. Their method, which utilises the supremum or one-step recursive residual technique, provides a flexible alternative in dynamic settings.

As reported in Table 2, the Chow test yields a cross-section F-probability value of 0.000, which falls below the conventional 5% significance level. Consequently, the null hypothesis (H_0), which assumes homogeneity across cross-sections, is rejected in favour of the alternative hypothesis (H_1). This result

indicates that the Fixed Effects model provides a better fit to the data compared to the Common Effects model. The robustness of this decision is further supported by the cross-section Chi-square statistic, which also falls below the 0.05 threshold, reinforcing the appropriateness of the Fixed Effects specification. Following this determination, the analysis proceeds with the Hausman test to identify the most suitable final estimation model for the study.

Table 3. Hausman Test

Test	Statistics	df	Prob.
Random cross-section	7,935	4	0.094

Source: Research Data, 2025

Sani (2023) introduced an alternative specification test known as the Robust Hausman Test (RHT FIID), which enhances the reliability of model selection in the presence of heteroscedasticity. This method utilises residuals derived from Weighted Least Squares (WLS) to construct a covariance matrix that is robust to non-constant error variances and the influence of high-leverage observations. By accounting for these potential sources of bias, the RHT FIID improves the robustness of decisions regarding fixed versus random effects specifications.

As shown in Table 3, the Hausman test produces a cross-section random probability value of 0.094, which exceeds the 5% significance level. Given that 0.094 > 0.05, the null hypothesis (H_0) cannot be rejected, and the alternative hypothesis (H_1) is therefore not supported. This result suggests that the random effects model is more appropriate for the data. The selection of the random effects model implies that unobserved heterogeneity across firms is not systematically related to the explanatory variables, and is instead treated as part of the stochastic error term. Following the confirmation of the random effects model as the most suitable specification, the next step involves conducting the Lagrange Multiplier (LM) test to evaluate whether the panel data model offers a superior fit compared to the pooled ordinary least squares (OLS) model.

Table 4. Lagrange Multiple Test

	Statistics	df	Prob.
Breusch-Pagan	19,081	0.204	19,285
	(0.000)	(0.651)	(0.000)

Source: Research Data, 2025

Huang et al. (2023) propose an enhanced Multiple Lagrange Multiplier (LM) test procedure that offers a more robust approach to detecting cross-sectional dependence in large panel datasets. This method is applicable to both heterogeneous panels and fixed effects models and accommodates regressors that are weakly exogenous or contain dependent lags, thereby increasing its utility in complex empirical settings.

As presented in Table 4, the results of the Breusch-Pagan LM test yield a cross-section probability value of 0.000, which is below the conventional 5% significance threshold. Given that 0.000 < 0.05, the null hypothesis (H_0), which assumes no cross-sectional dependence, is rejected in favour of the alternative hypothesis (H_1). This outcome confirms that the panel data model is preferable to the pooled ordinary least squares (OLS) model.

The LM test result reinforces the findings of the previous model selection procedures. Specifically, the Chow test indicated the inadequacy of the common

effects model, the Hausman test supported the use of the random effects specification, and the LM test affirmed the superiority of the panel structure over the pooled approach. Taken together, these results provide consistent empirical support for adopting the random effects model to examine the influence of firm-level characteristics on tax aggressiveness.

Table 5. ETR (Tax Aggressiveness) Panel Data Regression Model

Model	R2	F	Chow Test	Hausman test	LM Test
CEM	0.378	19,329			
FEM	0.144	5,362	√		
BRAKE	0.188	7,355		√	√

Source: Research Data, 2025

Zulfikar (2018) notes that the F-test is employed to assess the joint significance of all regression coefficients, while the Lagrange Multiplier (LM) test is used to determine whether the Random Effects Model (REM) is preferred over the Common Effects Model (CEM), provided the p-value is below the 0.05 significance level. In contrast, the Chow test is utilised to compare the CEM and Fixed Effects Model (FEM), guiding model selection based on panel structure.

Table 5 presents the estimation results for the three panel data models—CEM, FEM, and REM. Among them, the CEM exhibits the highest R-squared value at 0.378, surpassing the FEM (0.144) and REM (0.188). This suggests that, in terms of goodness-of-fit, the CEM explains a larger proportion of the variance in tax aggressiveness, as proxied by the Effective Tax Rate (ETR), than the alternative models.

The F-statistic further supports this observation. The CEM model reports a value of 19.330, notably higher than the FEM (5.362) and REM (7.356), indicating that the independent variables jointly exert a stronger and more statistically significant influence on the dependent variable within the CEM framework.

Despite these results, the final model selection must consider the results of all diagnostic tests conducted previously. While the CEM appears superior based on R-squared and F-statistic values, model specification tests—including the Chow, Hausman, and LM tests—consistently supported the adoption of the REM. Therefore, the REM remains the most appropriate estimation model, as it balances statistical fit with consistency in capturing unobserved heterogeneity across firms in the panel.

Table 6. Common Effect Model

Variable	Coefficient	Error	t-Statistic	Prob.
C	0.368	0.061	6,027	0.000
X1	-1,320	0.246	-5,353	0.000
X2	0.280	0.069	4,060	0.000
X3	-0.455	0.171	-2,650	0.009
X4	-0.065	0.067	-0.961	0.338

Source: Research Data, 2025

The multiple linear regression model used to test the relationship between variables is expressed in the form of the following equation:

$$ETR = 0.368 - 1.32\beta_1 + 0.28\beta_2 - 0.455\beta_3 - 0.065\beta_4 + \varepsilon \quad (2)$$

The regression coefficients presented in Table 6 provide insights into the direction and magnitude of the relationship between each independent variable

and the dependent variable, tax aggressiveness. The standard error accompanying each coefficient reflects the precision of the estimate; a value below 1 generally indicates that the estimate is relatively robust and not subject to substantial sampling error. Additionally, the t-statistic is used to assess statistical significance, with values approaching or exceeding 2 typically interpreted as indicative of significance within this analytical context (Omodero et al., 2025).

The estimation results reveal that profitability has a coefficient of –1.320 and is statistically significant at the 5% level. This negative relationship suggests that firms with higher profitability exhibit a lower propensity toward tax aggressiveness. One possible explanation is that more profitable firms are incentivised to maintain legitimacy and avoid reputational risks and regulatory scrutiny associated with aggressive tax practices.

Leverage displays a positive and statistically significant coefficient of 0.280, indicating that firms with higher debt levels are more likely to engage in aggressive tax planning. This finding is consistent with the theoretical perspective that interest expenses on debt offer tax deductibility benefits, thus encouraging firms to optimise tax liabilities through higher leverage.

For corporate social responsibility (CSR), the coefficient is –0.455 and statistically significant, suggesting a negative association with tax aggressiveness. This implies that firms actively disclosing CSR practices tend to be more tax compliant, possibly to preserve their social legitimacy and meet stakeholder expectations around ethical conduct.

In contrast, institutional ownership has a coefficient of –0.065, but the result is not statistically significant. This indicates that, in the context of the sampled firms, institutional investors have not exerted a sufficiently strong monitoring effect to deter aggressive tax strategies.

Overall, the findings suggest that three of the four independent variables—profitability, leverage, and CSR—significantly influence tax aggressiveness, while institutional ownership does not exhibit a statistically significant effect. These results are consistent with prior studies, including those by Khasanah et al. (2022), Hidayat and Muliasari (2020), and Alvin and Harsono (2021), who also report a significant relationship between firm characteristics and tax aggressiveness. Moreover, the positive association between leverage and tax avoidance aligns with findings from Wamser et al. (2025) and Amalia (2021), further reinforcing the theoretical link between debt financing and tax minimisation strategies.

Table 7. Partial Test Results (t) with Common Effect Model

Variable	Error	t-Statistic	Prob.
C	0.061	6.027	0.000
X1	0.246	-5.353	0.000
X2	0.069	4.060	0.000
X3	0.171	-2.650	0.009
X4	0.067	-0.961	0.338

*Source:*Research Data, 2025

In assessing the significance of the structural paths, the t-statistic derived from the bootstrapping procedure provides a robust approach to addressing potential violations of the normality assumption. The analysis adopts a two-tailed

t-test at a 0.5% significance level, following the procedure outlined by Asghar et al. (2020).

As shown in Table 7, the results indicate that profitability has a statistically significant negative effect on tax aggressiveness, with a probability value of 0.000 ($p < 0.05$) and a regression coefficient of –1.320. This suggests that firms with higher profitability are less likely to engage in aggressive tax practices. From the perspective of agency theory, managers of profitable firms may be more risk-averse in tax planning, taking into account reputational concerns and compliance requirements. This result is consistent with previous findings by Koussis et al. (2025), Supraptiningsih and Nuridah (2022), and Mustofa et al. (2021).

Leverage also demonstrates a significant positive relationship with tax aggressiveness ($p = 0.001$; coefficient = 0.280), indicating that firms with higher debt levels are more inclined to reduce their tax burden through aggressive strategies. This finding supports the argument that interest expense deductions incentivise firms to use debt as a tax shield. The result corroborates the studies of Muliasari and Hidayat (2020) and Harsono and Alvin (2021).

Similarly, corporate social responsibility (CSR) exhibits a significant negative effect on tax aggressiveness ($p = 0.009$; coefficient = –0.455). This indicates that firms with higher levels of CSR disclosure are less likely to adopt aggressive tax strategies, likely due to a heightened sensitivity to ethical norms, reputation management, and stakeholder expectations. These findings are in line with those reported by Simorangkir et al. (2018b) and Muljadi et al. (2022).

In contrast, institutional ownership shows no significant effect on tax aggressiveness ($p = 0.338 > 0.05$), suggesting that institutional investors, in the context of this study, may not exert sufficient influence to constrain aggressive tax behavior. This result is consistent with the findings of Yahaya and Omotola (2024). In sum, three of the four independent variables—profitability, leverage, and CSR—demonstrate statistically significant effects on tax aggressiveness, while institutional ownership does not.

CONCLUSION

This study concludes that selected internal firm characteristics significantly influence the level of tax aggressiveness. Specifically, both profitability and corporate social responsibility are negatively associated with tax aggressiveness, suggesting that firms with strong financial performance and high CSR engagement are less inclined to engage in aggressive tax strategies. Conversely, leverage exerts a positive effect, indicating that firms with higher debt levels are more likely to reduce tax burdens through aggressive planning. Institutional ownership, however, does not demonstrate a significant relationship, implying limited monitoring effectiveness by institutional investors in the observed context.

While these findings contribute to the growing body of literature on tax aggressiveness, the study is limited by its focus on a single sector—basic and chemical industries—and by the scope of variables examined. Future research should consider expanding the model to include additional determinants such as capital intensity, corporate governance mechanisms, and liquidity. Moreover, extending the analysis to a broader set of industries would enhance the generalisability of the findings. The use of additional statistical software platforms

such as SPSS or STATA is also recommended to improve data processing precision and analytical robustness.

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