

Corporate Social Responsibility and Capital Intensity in Tax Avoidance: The Moderating Role of Profitability

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ABSTRACT

Purpose – This study examines the relationship between Corporate Social Responsibility (CSR) and Capital Intensity with Tax Avoidance and investigates the moderating role of Profitability in Basic Materials companies listed on the Indonesia Stock Exchange. The study addresses the relevance of tax-related behavior in a sector characterized by substantial fixed-asset investment and increasing attention to corporate social and environmental responsibilities.

Design/methodology/approach – This study employs a quantitative explanatory approach using balanced panel data from 38 Basic Materials companies observed during 2022–2025, resulting in 152 firm-year observations. Data were obtained from annual reports, financial statements, and sustainability reports. CSR was measured using a disclosure index based on the GRI Standards 2021, Capital Intensity using the ratio of fixed assets to total assets, Profitability using Return on Assets (ROA), and Tax Avoidance was proxied by the Effective Tax Rate (ETR), calculated as income tax expense divided by pre-tax income, with lower ETR values indicating higher levels of tax avoidance. Panel regression and Moderated Regression Analysis were performed using EViews 14.

Finding/Results – The results show that CSR has no significant relationship with ETR, while Capital Intensity has a significant positive relationship with ETR, indicating an association with lower tax avoidance. Profitability does not significantly moderate either the CSR–ETR or Capital Intensity–ETR relationship.

Originality/Value – This study contributes empirical evidence from Indonesian Basic Materials companies by integrating CSR, Capital Intensity, and Profitability within a panel-data framework. The findings indicate that fixed-asset intensity is more closely associated with tax-related outcomes than CSR disclosure or profitability-based moderation in the observed sample.

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1. Introduction

Tax avoidance remains an important issue in corporate taxation because corporate tax payments represent a significant source of government revenue, while firms have economic incentives to minimize their tax liabilities within the boundaries of applicable regulations. Tax avoidance generally refers to strategies undertaken by firms to reduce their tax burden through the utilization of available provisions, differences, and opportunities within tax regulations. Although tax avoidance differs from tax evasion in terms of legality, extensive tax avoidance may raise concerns regarding the fairness of the tax system and the allocation of economic resources between corporations and governments. The accounting and taxation literature has consequently identified corporate tax avoidance as an important area of research, particularly because corporate tax decisions are closely connected with managerial decision-making, investment, financing, and corporate reporting (Hanlon & Heitzman, 2010). One factor that may be associated with corporate tax avoidance is Corporate Social Responsibility (CSR). CSR reflects the extent to which a company considers its economic, social, environmental, and stakeholder responsibilities in conducting its business activities. From a stakeholder perspective, companies are expected to demonstrate responsible behavior not only through financial performance but also through their contribution to society and the environment. Consequently, corporate tax payments may also be viewed as part of a firm's broader social responsibility because taxes provide resources for public services and economic development. However, the relationship between CSR and tax avoidance is not straightforward. Hoi et al. (2013) found that firms engaging in excessive irresponsible CSR activities were more likely to undertake tax-sheltering activities, suggesting that irresponsible corporate behavior can be associated with more aggressive tax practices.

The empirical relationship between CSR and tax avoidance also varies across institutional settings. Zeng (2019), using international evidence from firms across 35 countries, documented a significant relationship between CSR and corporate tax avoidance and showed that country-level governance can influence this relationship. The finding indicates that CSR cannot be considered independently from the institutional environment in which firms operate. More recent evidence also provides different perspectives. For example, Acosta Garcia et al. (2024) examined the relationship between CSR and tax avoidance while considering economic freedom as a moderating institutional factor, further indicating that the relationship between corporate responsibility and tax behavior may depend on the surrounding economic and institutional conditions.

In addition to CSR, capital intensity represents an important firm-specific factor that may be associated with tax avoidance. Capital intensity reflects the proportion of a firm's resources invested in fixed assets. Firms with substantial investments in fixed assets generally recognize depreciation expenses, which may affect taxable income and consequently influence the firm's effective tax burden. Therefore, differences in capital intensity may create different tax planning opportunities across firms. In the Indonesian context, Dharma & Noviani (2017) examined CSR and capital intensity in relation to tax avoidance and demonstrated that both factors are relevant in explaining corporate tax behavior. Subsequent Indonesian studies have continued to report varying findings concerning the relationship between capital intensity and tax avoidance, indicating that the role of fixed-asset investment in corporate tax behavior remains an empirical question.

Profitability provides another important dimension in understanding corporate tax avoidance. Profitability, commonly measured using Return on Assets (ROA), reflects a firm's ability to

generate earnings from its assets. Higher profitability generally implies greater taxable income and, consequently, potentially greater tax liabilities. This condition may create incentives for managers to undertake tax planning strategies in order to manage the firm's tax burden. Nevertheless, profitability does not necessarily lead to greater tax avoidance because highly profitable firms may also have stronger financial resources, greater visibility, and stronger incentives to maintain compliance and corporate reputation. Empirical evidence in Indonesia remains mixed. For example, Dewi & Merkusiwati (2023) reported that profitability was negatively associated with tax avoidance, while their study also demonstrated that the relationship between profitability and tax avoidance could vary according to firm characteristics.

The interaction between these factors becomes particularly relevant when profitability is considered as a moderating variable. CSR and capital intensity may influence corporate tax behavior through different mechanisms, while profitability can alter the extent to which these factors are translated into tax-related decisions. A profitable firm may have greater financial flexibility to invest in CSR programs, acquire productive fixed assets, and undertake tax planning. At the same time, profitability may increase public and regulatory scrutiny because firms generating higher profits may attract greater attention from stakeholders and tax authorities. Previous research has generally examined CSR, capital intensity, and profitability either as independent determinants of tax avoidance or has introduced other moderating variables. For example, Dewi & Merkusiwati (2023) examined firm size as a moderator of the relationships between profitability, capital intensity, and tax avoidance, while studies such as Aryatama & Raharja (2021) investigated CSR, capital intensity, and profitability jointly in explaining tax avoidance.

The existing evidence therefore indicates that the relationship between CSR, capital intensity, profitability, and tax avoidance remains inconclusive. Recent studies continue to produce different findings depending on the country, industry, period, measurement, and model specification. For instance, Dewi & Putri (2021) found that CSR did not significantly affect tax avoidance among Indonesian manufacturing firms, whereas other studies have reported significant relationships between CSR and corporate tax behavior. Similarly, studies examining capital intensity and profitability have produced heterogeneous results. This inconsistency suggests that examining the variables within a specific industrial context and using a panel-data framework may provide additional evidence concerning the mechanisms underlying corporate tax behavior.

The Basic Materials sector provides a relevant context for examining tax avoidance because its companies generally rely on substantial fixed assets and production facilities, making capital intensity particularly relevant to corporate tax decisions. At the same time, the sector faces increasing expectations regarding environmental and social responsibility, creating a context in which CSR, capital investment, and profitability may interact with tax behavior. Although previous studies have examined the direct relationships between CSR, capital intensity, profitability, and tax avoidance, limited evidence integrates these variables by examining profitability as a moderator, particularly among Basic Materials companies in Indonesia. Therefore, this study investigates the association of CSR and capital intensity with tax avoidance and examines the moderating role of profitability among Basic Materials companies listed on the Indonesia Stock Exchange during 2022–2025. Using panel data, tax avoidance is proxied by the Effective Tax Rate (ETR), calculated as income tax expense divided by pre-tax income, where a lower ETR indicates greater tax avoidance. By integrating these variables into

a moderated panel-data framework, this study provides empirical evidence on corporate tax behavior in an asset-intensive industry and extends the literature by examining how profitability may condition the relationships between CSR, capital intensity, and tax avoidance.

2. Literature Review & Hypothesis Development

2.1. Corporate Social Responsibility and Tax Avoidance

Corporate Social Responsibility (CSR) reflects a firm's commitment to addressing social, environmental, and stakeholder interests alongside its economic objectives (Velte, 2026). CSR is therefore not limited to corporate philanthropic activities but also encompasses the way firms conduct their business and respond to the interests of broader stakeholders (Velte, 2026). In the context of taxation, corporate tax behavior can be connected to CSR because tax payments represent one of the ways firms contribute to the societies and institutional environments in which they operate (Saleh et al., 2025). Firms with stronger CSR engagement may consequently have greater incentives to maintain responsible tax practices because aggressive tax avoidance can create reputational and legitimacy concerns among stakeholders (Pipatnarapong et al., 2025).

However, the relationship between CSR and tax avoidance remains theoretically and empirically inconclusive (Velte, 2026). A meta-analysis of 23 studies and 117 empirical estimates found that the relationship between CSR and tax avoidance varies considerably across studies and that the overall association ranges from absent to small or moderate depending on the research design and measurement employed (Marques et al., 2024). The heterogeneity of these findings indicates that CSR does not necessarily translate into a uniform pattern of corporate tax behavior across different firms and institutional environments (Marques et al., 2024).

Recent international evidence provides support for a negative association between CSR and tax avoidance (Saleh et al., 2025). Using 1,552 firms from 45 developed and emerging countries, Saleh et al. (2025) found that higher CSR performance was associated with lower tax avoidance, while institutional characteristics such as corruption, legal origin, and national culture influenced the strength of this relationship. Similarly, Pipatnarapong et al. (2025) found that firms in BRICS countries did not appear to use CSR strategically to legitimize tax avoidance but instead demonstrated CSR engagement and tax compliance as complementary aspects of responsible corporate conduct. These findings suggest that CSR may be associated with tax behavior through firms' broader commitment to responsible conduct toward stakeholders (Pipatnarapong et al., 2025).

Nevertheless, CSR does not always correspond to lower tax avoidance (Velte, 2026). Acosta Garcia et al. (2024) showed that the relationship between CSR and tax avoidance can vary according to the institutional environment, indicating that economic freedom may influence the way CSR is associated with corporate tax behavior. Velte (2026), based on a review of 73 peer-reviewed archival studies, similarly identified both positive and negative relationships between CSR and tax avoidance and emphasized the importance of firm-level and country-level contextual factors. Therefore, the mixed empirical evidence indicates that the relationship between CSR and tax avoidance remains an open empirical issue, particularly when examined within a specific industry and national context (Marques et al., 2024; Velte, 2026).

Based on the stakeholder perspective and the recent empirical evidence, CSR may be associated with corporate tax avoidance because firms that emphasize stakeholder interests

may also consider the social consequences of their tax strategies (Pipatnarapong et al., 2025; Saleh et al., 2025). However, the heterogeneous findings reported in previous studies provide insufficient basis for assuming a predetermined direction of the relationship (Marques et al., 2024; Velte, 2026). Therefore, this study proposes the following hypothesis:

H1: Corporate Social Responsibility is associated with the Effective Tax Rate (ETR), used as a proxy for tax avoidance.

2.2. Capital Intensity and Tax Avoidance

Capital intensity reflects the proportion of a firm's total assets invested in fixed assets and indicates the extent to which firms rely on long-term physical assets in conducting their operating activities (Dwi Hastina et al., 2024). Investment in fixed assets is relevant to corporate taxation because fixed assets generate depreciation expenses that may reduce accounting and taxable income and consequently influence the firm's effective tax burden (Imron et al., 2025). The relationship between capital intensity and tax avoidance is therefore associated with the tax implications of firms' investment decisions and the extent to which depreciation can affect their tax liabilities (Prananda et al., 2025).

Empirical evidence regarding this relationship, however, remains inconsistent. (Dwi Hastina et al., 2024), examining manufacturing companies listed on the Indonesia Stock Exchange during 2020–2022, found that capital intensity ratio did not have a significant effect on tax avoidance, although capital intensity was jointly significant with leverage and institutional ownership in explaining tax avoidance. Similarly, Indah & Magdalena (2024), using panel data from consumer non-cyclicals companies listed on the Indonesia Stock Exchange, found that capital intensity had no significant effect on tax avoidance (Indah & Magdalena, 2024). These findings indicate that a higher proportion of fixed assets does not necessarily translate into greater tax avoidance across different corporate settings.

Recent studies also provide contrasting evidence. (Prananda et al., 2025), examining multinational manufacturing companies listed on the Indonesia Stock Exchange during 2018–2023, reported that capital intensity did not significantly affect tax avoidance, suggesting that the level of capital investment was not a primary determinant of tax avoidance in their sample. In contrast, Imron et al. (2025), investigating multinational energy companies listed on the Indonesia Stock Exchange during 2019–2023, found that capital intensity significantly affected tax avoidance, with capital intensity measured as net fixed assets relative to total assets and tax avoidance measured using the Effective Tax Rate (ETR). The contrasting findings suggest that the relationship between capital intensity and tax avoidance may depend on industry characteristics, investment structures, and the tax implications associated with fixed assets.

Further evidence from (Mufarokhah & Kapriana, 2025) also reported that capital intensity did not have a significant effect on tax avoidance among palm oil processing and plantation companies listed on the Indonesia Stock Exchange during 2021–2024. The inconsistent findings across manufacturing, consumer non-cyclicals, multinational, energy, and palm oil companies indicate that the relationship between capital intensity and tax avoidance remains an empirical issue that warrants further investigation in specific industrial contexts (Dwi Hastina et al., 2024; Indah & Magdalena, 2024; Mufarokhah & Kapriana, 2025; Prananda et al., 2025).

For Basic Materials companies, the relationship is particularly relevant because firms in this sector may require substantial investment in machinery, production facilities, and other fixed assets to support their operations. The tax implications of these investments may therefore influence corporate tax behavior through depreciation and other asset-related expenses (Imron et al., 2025). Nevertheless, the mixed empirical findings provide insufficient basis for assuming

a predetermined direction of the relationship between capital intensity and tax avoidance (Dwi Hastina et al., 2024; Prananda et al., 2025). Accordingly, this study proposes the following hypothesis:

H2: Capital Intensity is associated with the Effective Tax Rate (ETR), used as a proxy for tax avoidance.

2.3. Profitability as a Moderator of the Relationship between Corporate Social Responsibility and Tax Avoidance

Profitability reflects a firm's ability to generate earnings from the resources and assets it controls and may influence managerial decisions concerning both CSR activities and tax strategies (Siswanto & Muslimin, 2026). Higher profitability may provide firms with greater financial capacity to undertake CSR activities, while simultaneously increasing the potential tax burden associated with higher taxable income (A. Wulandari et al., 2025). Consequently, profitability may condition the relationship between CSR and tax avoidance because the economic consequences of CSR activities and tax decisions can differ across firms with different levels of financial performance (Artini & Setiawan, 2021).

From a legitimacy perspective, CSR disclosure may encourage firms to maintain responsible corporate behavior, including compliance with tax obligations, because tax avoidance can create reputational and legitimacy risks (T. Wulandari et al., 2022). However, the strength of this relationship may depend on the firm's profitability because highly profitable firms face greater potential tax liabilities and may have stronger incentives to manage their tax burden (T. Wulandari et al., 2022). Artini & Setiawan (2021) provide empirical evidence that profitability moderates the relationship between CSR disclosure and tax avoidance among Indonesian mining companies, indicating that the association between CSR and tax behavior may differ according to firms' profitability levels.

Recent evidence, however, produces different findings regarding the moderating role of profitability (Siswanto & Muslimin, 2026). Siswanto & Muslimin (2026), using 37 Indonesian manufacturing firms and CSR disclosure measured through the GRI G4 framework, found that CSR disclosure was associated with lower tax avoidance, while profitability measured by ROA did not moderate the CSR–tax avoidance relationship. Similarly, Wulandari et al. (2022), based on 312 firm-year observations from Indonesian companies during 2022–2024, reported that CSR was associated with tax avoidance, but financial performance measured by ROA did not mitigate the relationship. These findings suggest that CSR may influence corporate tax behavior regardless of differences in profitability levels (Siswanto & Muslimin, 2026; T. Wulandari et al., 2022).

Contrasting evidence is also found in Saputra & Iskandar (2024), who examined CSR and tax aggressiveness with profitability as a moderating variable and reported that CSR had a significant negative relationship with tax aggressiveness, while profitability did not moderate the relationship. Meanwhile, Wulandari et al. (2022) found that firms with higher-quality CSR disclosure tended to exhibit lower tax avoidance and that high profitability strengthened the tax-compliance implication of CSR disclosure. The differences among these findings indicate that the moderating role of profitability remains empirically inconclusive and may vary according to industry characteristics, measurement approaches, observation periods, and institutional settings (Saputra & Iskandar, 2024; A. Wulandari et al., 2025; T. Wulandari et al., 2022).

For Basic Materials companies, profitability may be particularly relevant because firms in this sector operate with substantial physical assets and may face significant economic and

environmental responsibilities (A. Wulandari et al., 2025). A higher level of profitability may increase both the resources available for CSR activities and the potential tax consequences of corporate earnings, thereby potentially changing the relationship between CSR and tax avoidance (Artini & Setiawan, 2021). Nevertheless, the inconsistent empirical evidence provides insufficient grounds to predict a specific direction for the moderating effect of profitability (Siswanto & Muslimin, 2026; T. Wulandari et al., 2022). Therefore, this study proposes the following hypothesis:

H3: Profitability moderates the relationship between Corporate Social Responsibility and the Effective Tax Rate (ETR).

2.4. Profitability as a Moderator of the Relationship between Capital Intensity and Tax Avoidance

Capital intensity reflects the extent to which a firm allocates its resources to fixed assets, and the associated depreciation expenses may influence the firm's taxable income and tax burden (Julianti & Ruslim, 2023). Firms with higher capital intensity may therefore have greater opportunities to manage their tax burden through depreciation deductions, although the tax implications of fixed-asset investment may differ across firms and industries (Putri et al., 2022). The relationship between capital intensity and tax avoidance may consequently depend not only on the level of fixed-asset investment but also on the firm's financial condition (Annisa & Situmeang, 2025).

Profitability may play an important role in this relationship because more profitable firms generally generate higher taxable income and may face greater tax liabilities (Putri et al., 2022). At the same time, profitable firms may have greater financial capacity to invest in fixed assets and utilize the associated depreciation benefits, potentially altering the relationship between capital intensity and tax avoidance (Julianti & Ruslim, 2023). Therefore, profitability may function as a conditioning factor that determines whether the tax implications of capital-intensive investment are translated into tax avoidance behavior (Novitasari et al., 2025).

Empirical findings regarding this moderating relationship remain inconsistent. Putri et al. (2022), examining energy-sector companies listed on the Indonesia Stock Exchange during 2017–2021, found that capital intensity had a positive effect on tax avoidance and that profitability strengthened the relationship between capital intensity and tax avoidance. In contrast, Julianti & Ruslim (2023) found that capital intensity had a positive effect on tax avoidance, but profitability did not moderate the relationship between capital intensity and tax avoidance among consumer-goods manufacturing companies. These contrasting results indicate that the moderating role of profitability may vary across industries and research settings.

More recent evidence also produces different results. (Novitasari et al., 2025), examining 328 observations from real estate and property companies listed on the Indonesia Stock Exchange during 2020–2023, found that capital intensity did not significantly affect tax avoidance and that profitability was unable to moderate the relationship between capital intensity and tax avoidance. Similarly, Annisa & Situmeang (2025), using 141 manufacturing-company observations, reported that capital intensity did not significantly affect tax avoidance and that profitability did not moderate the relationship between capital intensity and tax avoidance. However, the most recent evidence from Trimurti & Puspitasari (2026), based on transportation and logistics companies listed on the Indonesia Stock Exchange during 2022–2024, also found that capital intensity did not significantly affect tax avoidance and that profitability did not moderate the relationship.

The differences in empirical findings suggest that profitability may not consistently alter the relationship between capital intensity and tax avoidance across industries and periods (Julianti & Ruslim, 2023; Putri et al., 2022). The role of profitability may depend on the characteristics of fixed-asset investment, the applicable tax environment, and the financial conditions of firms (Annisa & Situmeang, 2025; Novitasari et al., 2025). For Basic Materials companies, this relationship is particularly relevant because firms in this sector generally operate with substantial investments in production facilities, machinery, and other fixed assets, making both capital intensity and profitability important considerations in examining corporate tax behavior (Trimurti & Puspitasari, 2026). Given the inconsistent empirical evidence, this study does not assume a predetermined direction for the moderating effect of profitability.

H4: Profitability moderates the relationship between Capital Intensity and the Effective Tax Rate (ETR).

3. Methodology

This study employs a quantitative explanatory research design using panel data to examine the relationship between Corporate Social Responsibility (CSR), Capital Intensity, and Tax Avoidance, with Profitability as a moderating variable. The use of panel data is appropriate for examining firm-level observations across multiple periods and has also been applied in previous studies on tax avoidance (Du & Li, 2024; Firmansyah et al., 2022).

The population consisted of 113 Basic Materials companies listed on the Indonesia Stock Exchange (IDX) in 2025. Using purposive sampling, 38 companies met the predetermined criteria, resulting in 152 firm-year observations for the 2022–2025 period. The criteria included the availability of annual reports, financial statements, and sustainability reports for the entire observation period, the use of Indonesian Rupiah as the reporting currency, and positive profitability throughout the observation period.

The study uses secondary data obtained from annual reports, financial statements, and sustainability reports published by the companies and the IDX. CSR is measured using a disclosure index based on the GRI Standards 2021, while Capital Intensity is measured by the ratio of fixed assets to total assets. Profitability is measured using Return on Assets (ROA), and Tax Avoidance is proxied by the Effective Tax Rate (ETR), calculated as income tax expense divided by pre-tax income. A lower ETR indicates a higher level of tax avoidance.

The data were analyzed using EViews 14 through descriptive statistics and panel data regression. The appropriate panel model was determined using the Chow, Hausman, and Lagrange Multiplier tests. Moderated regression analysis was then employed to examine whether Profitability moderates the relationships between CSR and Tax Avoidance and between Capital Intensity and Tax Avoidance. Panel regression and moderation approaches have also been used in prior tax-avoidance research in Indonesia (Firmansyah et al., 2022).

To assess the robustness of the empirical findings, an additional sensitivity analysis was conducted using a winsorized Effective Tax Rate (ETR) measure. The ETR was winsorized at the 1st and 99th percentiles to reduce the potential influence of extreme observations. The same sample of 38 Basic Materials companies and 152 firm-year observations during 2022–2025 was retained. The direct-effect model was re-estimated using the Random Effect Model (REM), while the moderation model was re-estimated using the Fixed Effect Model (FEM), consistent with the model selection results of the baseline analysis. The robustness results were then compared with the baseline estimates in terms of coefficient direction, statistical significance, and model fit.

4. Result and Discussion

This section presents the empirical results of the study and discusses the findings in relation to the research hypotheses and previous studies. The analysis is based on 152 firm-year observations from 38 Basic Materials companies listed on the Indonesia Stock Exchange during 2022–2025. The results are presented through descriptive statistics, panel data model selection, direct-effect regression, and moderated regression analysis. The discussion focuses on the relationships between Corporate Social Responsibility, Capital Intensity, and Tax Avoidance, as well as the moderating role of Profitability.

4.1 Descriptive Statistics

The descriptive statistics are presented to provide an overview of the characteristics and distribution of the variables used in the study. The analysis includes the mean, median, maximum, minimum, and standard deviation for Tax Avoidance, Corporate Social Responsibility (CSR), Capital Intensity, and Profitability. Descriptive statistics provide a concise summary of the central tendency and dispersion of the observed data (Sekaran & Bougie, 2016). The results based on 152 firm-year observations are presented in Table 1.

Table 1. Descriptive Statistics

Variable	Mean	Media n	Maximu m	Minimu m	Std. Dev.
Effective Tax Rate (ETR; proxy for tax avoidance)	0.236043	0.222231	0.792436	-0.006331	0.109942
CSR	0.371156	0.269663	0.898876	0.056180	0.210219
Capital Intensity	0.406120	0.392649	0.859180	0.000198	0.237783
Profitability (ROA)	0.073148	0.053669	0.395323	0.000655	0.066664

Source: Authors' calculation using EViews 14.

The results show that the average ETR is 0.236043 (23.60%), indicating that the sample companies paid income tax equivalent to approximately 23.60% of their pre-tax income on average. CSR has an average disclosure level of 0.371156 (37.12%), while Capital Intensity averages 0.406120 (40.61%), indicating that fixed assets represented approximately 40.61% of total assets. Meanwhile, the average ROA is 0.073148 (7.31%), suggesting that the sampled companies generated an average return of 7.31% on their total assets. The relatively different standard deviations across variables also indicate variation in CSR disclosure, asset structure, profitability, and ETR among the sampled companies.

4.2 Panel Data Model Selection

Because the study uses panel data, model selection was conducted to determine the most appropriate estimation method among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The selection process employed the Chow test, Hausman test, and Lagrange Multiplier (LM) test, following the standard procedure for panel-data estimation (Hsiao, 2014). The results of the model selection tests are presented in Table 2.

Table 2. Panel Data Model Selection

Model	Chow Test (p-value)	Hausman Test (p-value)	LM Test (p-value)	Selected Model
Model 1	0.0000	0.5158	0.0000	REM

Model 2	0.0000	0.0048	Not conducted	FEM
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Source: Authors' calculation using EViews 14.

For Model 1, the Chow test produced a probability value of 0.0000, indicating that the FEM was preferred to the CEM. The Hausman test then produced a probability value of 0.5158, which supported the use of the REM over the FEM. As the Hausman test indicated the REM, the LM test was subsequently conducted and produced a probability value of 0.0000, confirming the Random Effect Model (REM) as the final model. The underlying test statistics in the thesis were 3.383191 for the Chow cross-section F test, 1.324221 for the Hausman test, and 29.94101 for the Breusch–Pagan LM test.

For Model 2, the Chow test also yielded 0.0000, initially indicating FEM. The Hausman test subsequently produced 0.0048, which confirmed the Fixed Effect Model (FEM). Therefore, the LM test was not conducted for Model 2 because the Hausman test had already determined FEM as the appropriate estimator.

4.3 Direct Effect Analysis

The direct effect analysis was conducted to examine the relationship between Corporate Social Responsibility (CSR) and Capital Intensity with Tax Avoidance. Based on the model selection results, Model 1 was estimated using the Random Effect Model (REM) with 152 firm-year observations from 38 Basic Materials companies during 2022–2025. Tax Avoidance is measured using the Effective Tax Rate (ETR), where a lower ETR indicates a higher level of tax avoidance.

Table 3. Direct Effect Analysis

Variable	Coefficient	t-Statistic	Prob.
C	0.174177	5.527720	0.0000
Corporate Social Responsibility (CSR)	0.045674	0.787217	0.4324
Capital Intensity (CI)	0.110592	2.113796	0.0362
Adjusted R-squared	0.022670		
F-statistic	2.751264		
Prob. (F-statistic)	0.067093		
Observations	152		

Source: Authors' calculation using EViews 14.

(Note: ETR is used as a proxy for tax avoidance. Lower ETR values indicate higher tax avoidance.)

The results in Table 3 show that Corporate Social Responsibility (CSR) has a positive coefficient of 0.045674, with a probability value of 0.4324. Since the p-value exceeds 0.05, CSR is not significantly associated with ETR in the sampled Basic Materials companies. Thus, the empirical evidence does not support a significant direct relationship between CSR disclosure and Tax Avoidance in the sampled Basic Materials companies. This finding indicates that differences in CSR disclosure levels were not sufficient to explain variations in ETR during the 2022–2025 period.

Meanwhile, Capital Intensity (CI) has a coefficient of 0.110592, with a t-statistic of 2.113796 and a probability value of 0.0362, indicating a statistically significant relationship at the 5% level. Because the dependent variable is ETR, the positive coefficient indicates that higher Capital Intensity is associated with a higher ETR, which corresponds to a lower level of Tax Avoidance. This result is consistent with empirical evidence showing that the relationship

between capital intensity and tax avoidance can vary across sectors and research settings (Aryatama & Raharja, 2021).

The adjusted R-squared of 0.022670 indicates that CSR and Capital Intensity jointly explain approximately 2.27% of the variation in ETR, while the remaining variation is explained by other factors outside the model. The F-statistic of 2.751264 with a probability of 0.067093 indicates that the two independent variables are not jointly significant at the 5% significance level.

4.3.1 Corporate Social Responsibility and Tax Avoidance

The results show that Corporate Social Responsibility (CSR) has a coefficient of 0.045674, with a t-statistic of 0.787217 and a probability value of 0.4324. Since the probability value is greater than 0.05, CSR does not have a statistically significant relationship with Tax Avoidance. Therefore, the hypothesis proposing a relationship between CSR and Tax Avoidance is not supported.

The positive coefficient indicates that higher CSR disclosure is associated with a higher Effective Tax Rate (ETR), although the relationship is statistically insignificant. Because Tax Avoidance is proxied by ETR, where a lower ETR indicates a higher level of tax avoidance, the result does not provide sufficient statistical evidence that differences in CSR disclosure systematically influence tax avoidance among Basic Materials companies during 2022–2025. In other words, variations in CSR disclosure were not followed by statistically meaningful variations in the companies' tax avoidance behavior.

This finding can be explained through legitimacy theory, which suggests that companies undertake and disclose CSR activities to obtain and maintain legitimacy from society and stakeholders. CSR disclosure therefore primarily communicates the company's conformity with prevailing social and environmental expectations. Consequently, CSR activities do not necessarily function as a direct instrument for determining corporate tax policy. The findings in the underlying study similarly indicate that CSR is more closely associated with social responsibility and corporate image than with tax policy decisions.

The finding is also relevant to signaling theory. CSR disclosure can serve as a positive signal regarding a company's commitment to social, environmental, and economic responsibilities. However, such a signal does not necessarily reflect the company's tax behavior. Thus, companies may disclose extensive CSR information to communicate responsible corporate behavior without this disclosure being directly connected to their tax planning decisions. This interpretation is consistent with the argument of Hoi et al. (2013), who found that irresponsible CSR activities were associated with greater tax avoidance, indicating that the relationship between CSR and tax behavior depends on the nature and quality of corporate responsibility rather than merely the extent of CSR disclosure.

The present finding also differs from some previous empirical evidence. Zeng (2019) reported a positive relationship between CSR and tax avoidance using listed companies from 35 countries, while the relationship was also influenced by country-level governance. Similarly, López-González et al. (2019) found that stronger social and environmental performance was negatively associated with tax avoidance, although the relationship differed according to family ownership. These contrasting findings demonstrate that the CSR–tax avoidance relationship is not uniform and may depend on the institutional environment, firm characteristics, measurement approaches, and research setting.

More recent evidence further supports the contextual nature of this relationship. Marques et al. (2024) conducted a meta-analysis of 117 estimates from 23 studies and found that the

association between CSR and tax avoidance ranges from no association to small or moderate relationships, with differences partly explained by the CSR and tax avoidance proxies, samples, and econometric specifications. Their findings suggest that firms may decouple CSR activities from tax avoidance behavior. Meanwhile, Saleh et al. (2025), using 1,552 firms from 45 countries, found that higher CSR performance was associated with lower tax avoidance, while the relationship varied according to institutional and cultural conditions.

Taken together, the differences between the present finding and previous studies indicate that CSR should not automatically be interpreted as a determinant of corporate tax avoidance. In the context of Indonesian Basic Materials companies, CSR disclosure may primarily represent efforts to maintain legitimacy and communicate corporate responsibility, while tax decisions may be influenced more strongly by financial, operational, regulatory, and firm-specific considerations. The relatively low adjusted R-squared of 0.022670 in the direct-effect model also indicates that CSR and Capital Intensity explain only a limited proportion of the variation in ETR, suggesting the presence of other factors outside the model.

4.3.2 Capital Intensity and Tax Avoidance

The results show that Capital Intensity (CI) has a coefficient of 0.110592, with a t-statistic of 2.113796 and a probability value of 0.0362. Since the probability value is below 0.05, Capital Intensity has a statistically significant relationship with Tax Avoidance. Therefore, the hypothesis proposing a relationship between Capital Intensity and Tax Avoidance is supported.

The positive coefficient of 0.110592 indicates that a one-unit increase in Capital Intensity is associated with an increase in ETR of 0.110592, *ceteris paribus*. Because Tax Avoidance in this study is proxied by ETR, where a lower ETR indicates greater tax avoidance, the positive coefficient should be interpreted as Capital Intensity being associated with a higher ETR and therefore a lower level of tax avoidance. This interpretation is important because the dependent variable in the regression is ETR rather than a direct measure of tax avoidance. The thesis regression output confirms the coefficient, t-statistic, and probability value reported above.

The finding can be explained from the perspective of Capital Intensity theory, in which investment in fixed assets generates depreciation expenses that affect reported income and potentially taxable income. Companies with substantial fixed assets therefore have a different tax-cost structure from firms with relatively lower fixed-asset intensity. However, the presence of depreciation benefits does not necessarily mean that companies will engage in greater tax avoidance. The actual tax effect depends on applicable tax depreciation rules, the composition of fixed assets, and how those assets are utilized in the company's operations.

This result differs from D. K. Dewi & Noviani, (2021), who found that Capital Intensity had a positive effect on tax avoidance among Indonesian mining companies. Their finding suggests that greater investment in fixed assets may provide companies with greater opportunities to utilize depreciation expenses in reducing their tax burden. (ojs.unud.ac.id) In contrast, Marsahala et al. (2020) found that Capital Intensity did not significantly affect tax avoidance among Indonesian manufacturing companies. Dewi & Merkusiwati (2023) also reported a negative effect of Capital Intensity on tax avoidance, indicating that greater fixed-asset investment was associated with lower tax avoidance. These differences indicate that the relationship between Capital Intensity and tax avoidance is sensitive to industry characteristics, measurement, and the institutional setting of the firms examined.

Recent evidence further demonstrates this variation. Dwi Hastina et al. (2024) examined manufacturing companies listed on the Indonesia Stock Exchange and included Capital Intensity Ratio as one of the determinants of tax avoidance. Their study provides additional evidence that the relationship between capital structure and corporate tax behavior remains relevant in Indonesian listed companies. Meanwhile, Prananda et al. (2025) examined multinational manufacturing companies listed on the Indonesia Stock Exchange during 2018–2023 and specifically investigated Capital Intensity alongside thin capitalization as determinants of tax avoidance. These recent studies reinforce the relevance of Capital Intensity as a variable in explaining corporate tax behavior, while differences in empirical results suggest that its effect should be interpreted according to the characteristics of the sample and research context.

In the context of Basic Materials companies, the significant relationship found in this study may be related to the relatively substantial investment requirements associated with production facilities, machinery, plants, and other fixed assets. Nevertheless, because the estimated coefficient is positive on ETR, the empirical evidence does not support the interpretation that greater Capital Intensity increases tax avoidance. Instead, within this sample, greater Capital Intensity is associated with higher ETR and consequently lower tax avoidance. This result suggests that fixed-asset investment in Basic Materials companies may be primarily connected with operational requirements rather than being systematically used as a mechanism for reducing effective tax rates.

Capital Intensity is significantly and positively associated with ETR among Basic Materials companies listed on the Indonesia Stock Exchange during 2022–2025. Since lower ETR values indicate higher tax avoidance, this finding suggests that greater Capital Intensity is associated with lower tax avoidance in the observed sample. This interpretation should be considered in light of the use of ETR as a proxy rather than a direct measure of tax avoidance.

4.4 Moderating Effect Analysis

The moderating effect analysis was conducted to examine whether Profitability, measured by Return on Assets (ROA), changes the relationship between Corporate Social Responsibility (CSR) and Capital Intensity with Tax Avoidance. Based on the model selection results, Model 2 was estimated using the Fixed Effect Model (FEM). The analysis incorporated interaction terms between CSR and Profitability ($CSR \times ROA$) and between Capital Intensity and Profitability ($CI \times ROA$). Tax Avoidance is measured using the Effective Tax Rate (ETR), where a lower ETR indicates a higher level of tax avoidance. The regression results are presented in Table 4.

Table 4. Moderating Regression Analysis

Variable	Coefficient	t-Statistic	Prob.
C	0.130520	1.843.573	0.0680
Corporate Social Responsibility (CSR)	0.185144	1.224.615	0.2234
Capital Intensity (CI)	0.229820	1.652.943	0.1012
Profitability (ROA)	-0.621438	-1.918.282	0.0577
$CSR \times ROA$	-0.234156	-0.254989	0.7992
$CI \times ROA$	-0.209064	-0.233438	0.8159
R-squared	0.615885		
Adjusted R-squared	0.467877		

F-statistic	4.161.166
Prob. (F-statistic)	0.000000
Observations	152

Source: Authors' calculation using EViews 14. (**Note:** The dependent variable is the Effective Tax Rate (ETR), used as a proxy for tax avoidance. Lower ETR values indicate higher levels of tax avoidance, whereas higher ETR values indicate lower levels of tax avoidance.)

The results show that the interaction between CSR and Profitability has a coefficient of -0.234156 with a probability value of 0.7992 , while the interaction between Capital Intensity and Profitability has a coefficient of -0.209064 with a probability value of 0.8159 . Both probability values are greater than 0.05 , indicating that Profitability does not significantly moderate either the relationship between CSR and Tax Avoidance or the relationship between Capital Intensity and Tax Avoidance. The adjusted R-squared of 0.467877 indicates that the moderation model explains approximately 46.79% of the variation in ETR. The overall model is statistically significant, as indicated by the F-statistic probability of 0.000000 .

4.4.1 Profitability as a Moderator of CSR and Tax Avoidance

The interaction between Corporate Social Responsibility (CSR) and Profitability (ROA) produces a coefficient of -0.234156 , with a t-statistic of -0.254989 and a probability value of 0.7992 . Since the probability value is greater than 0.05 , the interaction effect is statistically insignificant. Therefore, Profitability does not moderate the relationship between CSR and Tax Avoidance, and the corresponding hypothesis is not supported.

The negative coefficient of the interaction term indicates the direction of the estimated interaction; however, because the coefficient is statistically insignificant, it should not be interpreted as evidence that higher profitability actually weakens or strengthens the CSR–tax avoidance relationship. In other words, differences in profitability do not provide sufficient statistical evidence to explain changes in the relationship between CSR disclosure and ETR among the sampled Basic Materials companies.

This finding can be viewed from the perspective of legitimacy theory, which suggests that CSR disclosure is primarily associated with companies' efforts to obtain and maintain legitimacy from stakeholders. The implementation and disclosure of CSR may therefore reflect broader social and environmental responsibilities rather than being directly determined by the level of profitability. The insignificant interaction indicates that the extent of profitability does not materially change this relationship in the observed sample.

The finding is consistent with Wulandari et al. (2022), who examined Indonesian companies using profitability as a moderating variable in the relationship between CSR disclosure and tax avoidance. Their study also considered the role of profitability in explaining the CSR–tax avoidance relationship.

However, the result differs from Artini & Setiawan (2021), who examined mining companies listed on the Indonesia Stock Exchange and found that profitability was able to moderate the effect of CSR disclosure on tax avoidance. The difference may reflect differences in industry characteristics, observation periods, CSR measurement, and tax avoidance proxies.

More recent evidence also provides support for the absence of a moderating effect. Wulandari et al. (2025) examined 312 observations of Indonesian companies for 2022–2024 and found that financial performance measured by ROA did not mitigate the relationship between CSR and tax avoidance. Similarly, Siswanto & Muslimin (2026) examined Indonesian manufacturing

firms using CSR disclosure, ETR, and ROA and reported that profitability did not moderate the CSR–tax avoidance relationship.

Thus, the evidence from the present study suggests that profitability does not significantly change the relationship between CSR disclosure and tax avoidance. CSR disclosure and profitability appear to operate without a statistically significant interaction in explaining ETR among Basic Materials companies during 2022–2025.

4.4.2 Profitability as a Moderator of Capital Intensity and Tax Avoidance

The interaction between Capital Intensity (CI) and Profitability (ROA) produces a coefficient of -0.209064 , with a t-statistic of -0.233438 and a probability value of 0.8159 . Because the probability value exceeds 0.05 , the interaction effect is statistically insignificant. Therefore, Profitability does not significantly moderate the relationship between Capital Intensity and Tax Avoidance, and the corresponding hypothesis is not supported.

The negative interaction coefficient suggests the estimated direction of the interaction between Capital Intensity and ROA. Nevertheless, the high probability value indicates that this coefficient does not provide sufficient statistical evidence that profitability changes the relationship between Capital Intensity and ETR. Consequently, differences in profitability among the sampled companies do not significantly alter the relationship between fixed-asset intensity and tax avoidance.

From the perspective of capital intensity, investment in fixed assets can create depreciation expenses that affect accounting income and taxable income. However, the existence of fixed assets does not automatically imply that the tax implications of capital intensity will differ according to the company's profitability. The tax treatment of depreciation, the composition and utilization of fixed assets, and applicable tax regulations may influence the relationship independently of ROA.

The finding is consistent with Sumantri et al. (2022), who examined manufacturing companies in Indonesia and found that profitability measured by ROA was unable to moderate the relationship between Capital Intensity and Tax Avoidance.

In contrast, Putri et al. (2022) found that profitability could strengthen the effect of Capital Intensity on Tax Avoidance in energy-sector companies listed on the Indonesia Stock Exchange. Their study used 188 observations from the 2017–2021 period, indicating that the moderating role of profitability may vary across sectors and research settings.

Recent evidence also demonstrates that the moderating role of profitability is not necessarily consistent. Adirianto & Randy Kuswanto (2025) examined consumer-goods companies listed on the IDX and found that firm size did not moderate the effects of profitability, Capital Intensity, and leverage on tax avoidance, illustrating that moderation effects can depend on the specific variables and sample characteristics examined. More directly, Trimurti & Puspitasari (2026) examined Capital Intensity and tax avoidance with profitability as a moderator and found that profitability did not moderate the relationship between Capital Intensity and tax avoidance among Indonesian transportation and logistics companies.

Therefore, the present findings indicate that Profitability does not significantly change the relationship between Capital Intensity and Tax Avoidance in Basic Materials companies. The tax implications associated with fixed-asset intensity appear not to vary systematically according to the level of ROA during the 2022–2025 observation period.

4.5 Robustness and Sensitivity Analysis

To assess the robustness of the empirical findings, a sensitivity analysis was conducted by re-estimating the regression models using a winsorized Effective Tax Rate (ETR) measure. The

ETR was winsorized at the 1st and 99th percentiles to reduce the potential influence of extreme observations. The same sample of 38 Basic Materials companies and 152 firm-year observations during 2022–2025 was retained, while the panel estimation methods were maintained in accordance with the baseline models. Accordingly, the direct-effect model was estimated using the Random Effect Model (REM), whereas the moderation model was estimated using the Fixed Effect Model (FEM).

Table 5: Robustness and Sensitivity Analysis

Variable	Model 1: Baseline ETR	p-value	Model 1: Winsorized ETR	p-value	Model 2: Baseline ETR	p-value	Model 2: Winsorized ETR	p-value
C	0.174177	0.0000	0.177790	0.0000	0.130520	0.0680	0.147857	0.0326
CSR	0.045674	0.4324	0.037198	0.5102	0.185144	0.2234	0.145739	0.3201
Capital Intensity	0.110592	0.0362	0.108338	0.0347	0.229820	0.1012	0.217663	0.1077
Profitability (ROA)	—	—	—	—	0.621438	0.0577	-0.666653	0.0352
CSR × ROA	—	—	—	—	0.234156	0.7992	-0.087695	0.9214
CI × ROA	—	—	—	—	0.209064	0.8159	-0.160074	0.8534
Adjusted R-squared	0.022670	—	0.021711	—	0.467877	—	0.473139	—
Prob. (F-statistic)	0.067093	—	0.072175	—	0.000000	—	0.000000	—
Observations	152	—	152	—	152	—	152	—

Source: Authors' calculation using EViews 14. (**Note:** ETR is the dependent variable and is used as a proxy for tax avoidance. Winsorized ETR refers to ETR values winsorized at the 1st and 99th percentiles. Lower ETR values indicate higher levels of tax avoidance. The robustness results are compared with the baseline estimates in terms of coefficient direction and statistical significance.)

For the direct-effect model, the robustness results remain consistent with the baseline estimation. The coefficient of CSR decreases slightly from 0.045674 to 0.037198, while its probability value increases from 0.4324 to 0.5102. Thus, CSR remains statistically insignificant. Capital Intensity also remains positive and statistically significant, with its coefficient changing only slightly from 0.110592 to 0.108338 and its probability value changing from 0.0362 to 0.0347. Therefore, the statistical conclusion regarding the direct effects remains unchanged after winsorization.

For the moderation model, the results also demonstrate substantial consistency with the baseline estimation. The interaction between CSR and Profitability remains statistically insignificant, with the probability value changing from 0.7992 to 0.9214. Similarly, the interaction between Capital Intensity and Profitability remains statistically insignificant, with the probability value changing from 0.8159 to 0.8534. Therefore, the conclusion that Profitability does not significantly moderate either the CSR–Tax Avoidance relationship or the Capital Intensity–Tax Avoidance relationship remains unchanged.

The sensitivity analysis indicates that the main conclusions remain broadly consistent after winsorization of ETR. CSR remains statistically insignificant, while Capital Intensity retains a positive and significant association with ETR in the direct-effect model. In the moderation model, both interaction terms remain statistically insignificant. Although the direct effect of Profitability becomes statistically significant in the sensitivity estimation, the evidence does not change the conclusions regarding the two moderation hypotheses. These results suggest that the main findings are generally robust to the treatment of extreme ETR observations.

5. Conclusion and Suggestion

This study examined the relationship between Corporate Social Responsibility (CSR) and Capital Intensity with Tax Avoidance and investigated the moderating role of Profitability in Basic Materials companies listed on the Indonesia Stock Exchange during 2022–2025. Based on 152 firm-year observations from 38 companies, the findings provide several conclusions.

5.1 Corporate Social Responsibility does not have a significant relationship with ETR.

The CSR coefficient is 0.045674 with a probability value of 0.4324, indicating that variations in CSR disclosure are not statistically associated with changes in ETR among the sampled companies.

5.2 Capital Intensity has a significant positive association with ETR, indicating lower tax avoidance.

The coefficient of Capital Intensity is 0.110592 with a probability value of 0.0362. Because the dependent variable is ETR and lower ETR values indicate higher tax avoidance, the positive coefficient indicates that higher Capital Intensity is associated with higher ETR and, consequently, lower tax avoidance in the sampled Basic Materials companies.

5.3 Profitability does not significantly moderate the relationship between CSR and ETR.

The interaction between CSR and ROA has a coefficient of -0.234156 and a probability value of 0.7992, indicating that differences in profitability do not significantly change the relationship between CSR disclosure and ETR.

5.4 Profitability does not significantly moderate the relationship between Capital Intensity and ETR.

The interaction between Capital Intensity and ROA has a coefficient of -0.209064 with a probability value of 0.8159. Thus, the level of profitability does not significantly alter the relationship between Capital Intensity and ETR in the observed sample.

The findings show that CSR disclosure is not significantly associated with ETR, whereas Capital Intensity has a significant positive association with ETR. Profitability does not significantly moderate either relationship. Because ETR is used as a proxy for tax avoidance, these findings should be interpreted in terms of the observed effective tax rate: higher ETR is associated with lower tax avoidance, while lower ETR indicates higher tax avoidance. The results also highlight the importance of considering industry characteristics and alternative tax avoidance measures in future research.

6. Limitations and Future Research

This study has several limitations that should be considered when interpreting the findings. First, the study focuses only on Basic Materials companies listed on the Indonesia Stock Exchange during 2022–2025, so the findings may not be directly generalizable to other industries or periods. Second, the model includes only Corporate Social Responsibility and Capital Intensity as independent variables, with Profitability as a moderating variable, leaving other potential determinants of tax-related behavior outside the model. Third, the study relies on specific operational measures, particularly CSR disclosure based on GRI Standards 2021 and Effective Tax Rate (ETR) as the proxy for Tax Avoidance, which may produce different results when alternative measures are applied. These limitations are also identified in the underlying research.

Future research could therefore extend the observation period, include companies from other sectors or countries, and incorporate additional variables such as leverage, firm size, corporate governance, institutional ownership, or tax-related characteristics. Future studies may also employ alternative proxies for CSR, Capital Intensity, Profitability, and Tax Avoidance to provide broader evidence and facilitate comparison across different research settings. Although the sensitivity analysis using winsorized ETR supports the consistency of the main findings, future studies could employ alternative tax avoidance proxies to examine whether the results remain consistent across different measurement approaches.

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Declaration of AI and AI-assisted technologies in the writing process

During the preparation of this manuscript, the authors used AI-assisted technologies to support language editing, improve the clarity and organization of the manuscript, and assist in the drafting and refinement of certain sections. All research data, statistical analyses, interpretations, and conclusions were reviewed and verified by the authors. The authors take full responsibility for the content of the manuscript and for ensuring the accuracy and integrity of the information presented. AI-assisted technologies were not used to generate or fabricate research data, statistical results, or references.

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