

ESG, Profitability and Leverage on Tax Aggressiveness: The Moderating Role of Firm Size in IDX-Listed Firms, 2020-2024

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Abstract

This research examines the effect of ESG, profitability, and leverage on tax aggressiveness, measured by the Cash Effective Tax Rate (CETR) with firm size as a moderating variable. The analysis focuses on firms listed on the Indonesia Stock Exchange from 2020-2024 period. Since the regression model uses CETR directly as a dependent variable, a lower CETR value indicates higher tax aggressiveness, while a higher CETR value indicates lower tax aggressiveness. Therefore, a negative regression coefficient is interpreted as an increase in tax aggressiveness, whereas a positive coefficient indicates a decrease in tax aggressiveness. A quantitative approach was employed using panel data regression and Moderated Regression Analysis (MRA). This study sample consisted of 41 companies selected via purposive sampling, resulting in 205 observations. The results show that ESG and profitability did not show a significant effect on tax aggressiveness. However, the study found that leverage has a statistically significant impact on tax aggressiveness. Furthermore, firm size weakens the effect of leverage on tax aggressiveness, thereby moderating the relationship between leverage and tax aggressiveness. In contrast, firm size does not exert a significant moderating effect on the relationships between ESG and tax aggressiveness, nor between profitability and tax aggressiveness. Although ESG performance and profitability do not significantly explain corporate tax aggressiveness during the study period, the findings indicate that debt policy remains the primary determinant of corporate tax aggressiveness.

KEYWORDS

ESG; firm size; leverage; profitability; tax aggressiveness.

Introduction

Taxation plays a crucial role in the state's financial system, as it is one of the government's most important sources of revenue. This revenue is used to fund various public programs and expenditures, promote sustainable economic growth, and provide social services that strengthen the common good (Ananda Prasetyo et al., 2024; Kurnia et al., 2023). These payments are legally enforceable and offer no direct benefits in return, as their primary goal is to support public welfare. Because of this fiscal importance, the government constantly works to boost state revenue by improving compliance and strictly monitoring corporate actions to ensure long term economic stability (Indri Pratiwi et al., 2024). However, companies often see tax payments as a financial burden that reduces their profitability, creating a natural conflict of interest and motivating them to minimize their tax liabilities (Rohman & Aliyah, 2024). This friction often results in tax aggressiveness, where corporations take planned actions to reduce their taxable income (Mulya & Anggraeni, 2022). These tax planning activities span a wide spectrum, from lawful methods to forbidden practices. Tax avoidance legally navigates through gaps in current regulations, tax evasion involves illegal actions such as reporting false financial data or concealing income (Bako, 2021). Therefore, tax aggressiveness is a deliberate corporate strategy designed to minimize taxable wealth and reduce the company's financial contributions to the state (Shamil et al., 2024).

Aggressive tax strategies are often driven by conflicting goals and information

imbalances between the government and corporations (Rohman & Aliyah, 2024). This dynamic can be explained through Agency Theory, a concept introduced by Jensen & Meckling (1976) that examines the tense relationship between principals and agents. In a fiscal setting, the state is the principal focused on optimizing tax revenue, whereas corporate managers are the agents looking to cut tax costs to improve profitability. Because managers have more detailed access to internal financial data than the government, a state of information asymmetry occurs. This gap allows corporate agents to make self-serving decisions that conflict with the goals of the state, which ultimately generates agency costs (Widiantari et al., 2024).

The Environmental, Social, and Governance (ESG) paradigm has risen to prominence as a critical instrument for gauging corporate sustainability and non-financial outcomes. Beyond merely scrutinizing ecological, social, and governance dimensions, ESG serves as a barometer for a company's capacity to mitigate risks, bolster its public image, and secure enduring legitimacy with its diverse stakeholder base (Aydoğmuş et al., 2022; Refinitiv, 2024). Firms with stronger ESG performance are generally expected to adhere to higher standards of responsibility and governance. Accordingly, ESG may reduce tax aggressiveness by enhancing transparency, improving disclosure practices, and reinforcing internal controls, which help constrain opportunistic managerial actions (Pham et al., 2022; Yoon et al., 2021). In line with this perspective, Gunadi et al. (2025) found that companies with better ESG performance are less likely to pursue aggressive tax strategies, as this could threaten their reputation and undermine stakeholder trust.

Profitability is one of the financial metrics that can be used to evaluate a company (Tresna Murti et al., 2024). As an essential measure of corporate performance, profitability indicates how effectively a company generates income from its business activities and supports long-term growth (Adji, 2023). The level of profit earned by a firm can affect its tax obligations because higher earnings typically result in greater taxable income (Dhana Kurniawan, 2024). Companies with strong profitability are usually better positioned to meet their tax responsibilities, while firms with lower profits may be more likely to seek ways to minimize tax expenses in order to protect their financial condition (Hartono, 2024). Previous research Alfandia (2024) also suggests that profitability is related to tax aggressiveness, although empirical findings remain mixed.

Leverage is an important factor associated with tax aggressiveness because companies often use debt financing to reduce taxable income. Interest expenses from debt can be deducted as operational costs, thereby lowering tax liabilities (Tanjaya & Nazir, 2021). Leverage measures the extent to which a firm relies on short-term and long-term debt to finance its assets; generally, higher leverage provides greater opportunities to decrease taxable income through deductible interest expenses (Apriliansa, 2022). However, prior studies provide mixed evidence regarding the effect of leverage on tax aggressiveness. Mappadang (2021) found a positive relationship, while Masyitah et al. (2022).

Although the relationship between ESG and tax aggressiveness has been the focus of extensive research, there are still gaps that require further study. One of the main issues is the lack of consensus on how ESG affects tax aggressiveness. Several studies report a negative relationship, suggesting that companies with above-average ESG performance are less likely to engage in aggressive tax practices (Jiang et al., 2024; Mukhtaruddin et al., 2025). However, some studies report different results. Lee (2024) found that the effect of ESG on tax aggressiveness depends on the quality of corporate governance. Companies with strong governance, the social and governance dimensions are

positively correlated with tax aggressiveness, while environmental dimensions do not show a significant relationship. Furthermore, a meta-regression by Mitroulia et al. (2025), which included 33 studies, concluded that the empirical evidence regarding the relationship between ESG and tax aggressiveness is heterogeneous and inconsistent, influenced by differences in ESG indicators and measures of tax aggressiveness, sample characteristics and the economic methods used.

Empirical evidence on whether the effect of ESG, profitability and leverage on tax aggressiveness varies by firm size remains limited. Furthermore, studies that simultaneously analyze ESG, profitability and leverage while firm size as a moderator variable for firms listed on the Indonesia Stock Exchange for the 2020-2024 period are still rare. Most previous studies have focused on the direct effect of ESG on tax aggressiveness without considering firm characteristics that might moderate this relationship. Research by Fathurrahman & Rosiana Dewi (2024) indicates that a heightened dedication to sustainable practices and ethical governance anticipates more transparent corporate conduct and enhanced tax compliance, thereby mitigating the probability of tax aggressiveness. The influence of ESG performance on tax aggressiveness is likely conditional upon firm size, indicating that this relationship exhibits significant heterogeneity rather than a uniform pattern across all corporations (Mukhtaruddin et al., 2025). Between 2020 and 2024, firms varied substantially in their ability to balance strategic resource allocation for ESG execution with the maintenance of financial viability, while simultaneously navigating intensifying stakeholder and regulatory pressures regarding sustainability, financing strategies, and regulatory compliance. Amid the post-pandemic recovery, widespread realignments in corporate debt structures to secure liquidity and shifts in tax strategies to defend profitability indicate that the interrelationships among ESG performance, leverage, and tax aggressiveness are contingent upon organizational scale. Consequently, firm size emerges as a critical moderating variable within this post-crisis economic landscape.

This study includes all companies listed on the Indonesia Stock Exchange from 2020 to 2024 that have an ESG Combined Score in Refinitiv database and did not incur losses during that time period, as this period is considered representative of post-Covid-19 conditions. In the post-pandemic phase, companies adjusted their business strategies, restructured their financing and experienced fluctuations in profitability, alongside increasing attention to sustainability practices and information disclosure. Furthermore, the adoption of ESG reporting in Indonesia accelerated throughout this period, thereby providing a relevant empirical context for examining the determinants of tax aggressiveness. Consequently, the findings of this study are expected to provide a more accurate picture of corporate conditions in the post-pandemic era compared to studies using pre-pandemic data.

Literature Review and Hypothesis Development Agency Theory

Originating from Jensen & Meckling (1976) publication, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," agency theory elucidates the contractual dynamics between a delegating authority (the principal) and an executing party (the agent). In this context, the relationship stems from the fundamental separation of ownership rights, risk exposure, corporate control, and decision-making powers. A defining characteristic of this principal-agent dynamic is the prevalence of information asymmetry, where the agent typically holds superior knowledge compared to the principal regarding the firm's operations and strategic choices. This situation has the potential to encourage the agent to act in a manner

Table 1. Tax Revenue Targets and Realizations for 2020-2024 (In Billions of Rupiah)

Year	Target	Realization	Persent age
2020	Rp 1.404.520,57	Rp 1.285.136,32	91%
2021	Rp 1.444.555,39	Rp 1.547.841,10	107%
2022	Rp 1.784.000,00	Rp 2.034.553,00	114%
2023	Rp 2.081.914,50	Rp 2.118.348,00	101%
2024	Rp 2.121.083,56	Rp 2.309.860,00	108%

Source: Ministry of Finance of the Republic of Indonesia (2026)

inconsistent with the principal's objectives, ultimately resulting in what is known as agency costs (Khoirunnasikin & Nursyirwan Iswanti, 2023; Widianari et al., 2024).

The relationship between ESG, profitability, leverage and tax aggressiveness has been examined in previous studies. Gunadi et al. (2025) reveal that ESG significantly influence tax aggressiveness on the companies listed in the IDX. Higher ESG Scores tend to reduce companies tax aggressiveness. In other studies, similar findings have been reported, indicating that profitability influences tax aggressiveness. These findings suggest that highly profitable businesses may exhibit certain tendencies to their tax strategies (Amelia Lensi Matei & I Dewa Nyoman Badera, 2025; Dinata & Rizki, 2026). The results of various studies indicate a relationship between leverage and tax aggressiveness. According to a study conducted by Ananda Prasetyo et al. (2024), leverage can motivate companies to engage in tax planning because interest expenses are deductible from taxable income. However, a study by Zahra (2025) shows that this effect is not always significant, depending on industry and business characteristics. In this study, Agency Theory is used as a foundation to align the interests of the principal and the agent so that they share aligned objectives. The government, acting as the principal, aims to optimize tax revenue from corporate taxpayers. In contrast, firms acting as agents or taxpayers are inclined to reduce their tax obligations to maximize earnings. This misalignment of objectives underscores the potential for agency conflict, which constitutes the central focus of this research.

Due to varying research findings, this study also lacks consistency regarding the role of firm size as a moderator variable. While some studies indicate that firm size can strengthen the relationship between financial ratios and tax aggressiveness, other studies suggest that this relationship actually weakens or is even insignificant (Lailiyah et al., 2024; Suhendar et al., 2024). This indicates that there is no clear consensus on how firm size moderation plays a role in the relationship between ESG, profitability, debt ratios, and tax aggressiveness.

Table 1 shows the trend in Indonesia's real tax revenue for 2020-2024. In 2020, actual revenue was only 91% of the target, primarily due to the economic turmoil caused by the COVID-19 pandemic and a decline in business activity, which led to a narrowing of the tax base. Since 2021, revenue has begun to recover and show stronger performance reaching 107% of the target in 2021, 114% in 2022, 101% in 2023, and 108% in 2024. These signaling a continued fiscal recovery in the post pandemic period.

Although these figures indicate an increase in national tax revenue, this trend cannot be directly taken as evidence of the presence or absence of aggressive tax planning by companies. Actual revenue is influenced by various macroeconomic and policy factors, including economic growth, changes in tax regulations, and the effectiveness of tax administration. The State of Tax Justice (2025) report estimates that Indonesia's potential tax revenue leakage

amounts to approximately Rp46.7 trillion per year due to the misuse of corporate tax rules and the shifting of profits to low tax.

These findings indicate that corporate tax aggressiveness remains a critical issue, as it has the potential to erode the national tax base and threaten the long-term sustainability of government revenue. Therefore, research into the determinants of tax aggressiveness, including corporate characteristics such as ESG performance, profitability, leverage and firm size is of the most urgency to support fiscal policy and tax enforcement efforts.

ESG

Based on a sense of responsibility toward society and the implementation of corporate governance standards, ESG serves as a framework for evaluating a company's non-financial performance. In the context of market-based measurement, ESG is often described as a metric that reflects a company's performance based on environmental, social, and governance. This metric is based on company data and other public sources (Refinitiv, 2024). ESG serves not only as a tool for assessing sustainability, but also as a benchmark for evaluating the quality of risk management, reputation, and corporate legitimacy in the eyes of the public and investors (Aydoğmuş et al., 2022).

Agency Theory explains that the implementation of ESG practices has the potential to reduce conflicts of interest between managers and shareholders by improving transparency, accountability, and the quality of corporate governance. Greater transparency reduces information asymmetry that managers could exploit to act opportunistically, including through aggressive tax policies. Furthermore, strong corporate governance reinforces oversight mechanisms over managerial decisions, thereby reducing the likelihood of aggressive tax strategies being implemented. Consequently, companies with above-average ESG performance tend to demonstrate higher levels of tax compliance due to pressure from investors and other stakeholders to act accountably.

According to several studies, there is a link between ESG and tax aggressiveness. Mukhtaruddin et al. (2025) found a negative relationship between ESG and tax aggressiveness, suggesting that improvements in ESG performance are associated with a reduction in aggressive tax practices. Similar findings were reported by Mitroulia et al. (2025), who concluded that companies with higher ESG scores tend to exhibit lower level of tax aggressiveness. Based on these findings, the following hypothesis is formulated:

H1: ESG has a negative effect on tax aggressiveness

Profitability

Profitability refers to a company's ability to generate profits over a specific period of time, based on the returns on assets and equity. The method used to measure profitability are based on the profits generated and the resources available to the company (Hidayah, 2024). In generally, more profitable companies are better equipped to pay their taxes. On the other hand, in order to lessen the impact of their losses, companies with low profitability frequently engage in tax avoidance (Hartono, 2024). Furthermore, from a tax perspective, there is a strong correlation between a company's return on total capital and its tax burden (Ellysta, 2025). The following hypothesis is therefore proposed:

H2: Profitability has a positive effect on tax aggressiveness

Leverage

According to Paskalina & Ningsih (2022), the leverage ratio is a measure that indicates the extent to which assets are financed by borrowed capital. In addition, companies with high

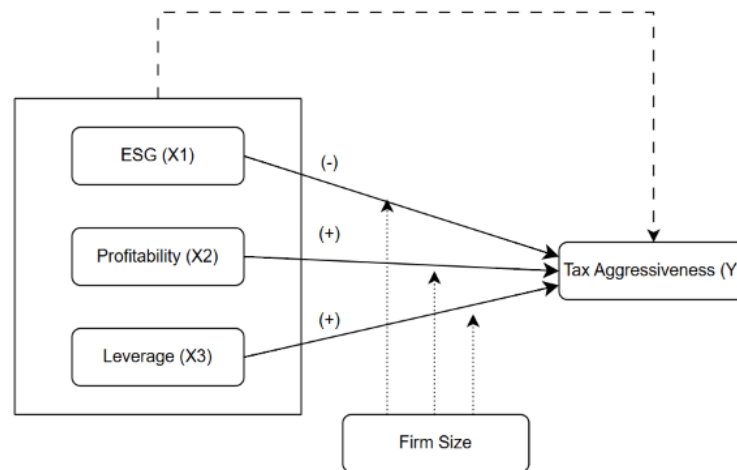


Figure 1. Frame of Mind

debt levels face greater risks, as they must pay a significant portion of their operating income in interest to service that debt, which ultimately reduces net income. This practice can be considered an aggressive tax strategy, as companies often use it to reduce their tax burden.

Khan & Nuryanah (2023) found that the debt ratio has a positive effect on tax aggressiveness. This finding suggests that if companies have more debt financing, they are more likely to engage in aggressive tax practices because interest expenses are tax-deductible. This study proposes the following hypothesis based on theoretical framework and findings of previous research:

H3: Leverage has a positive effect on tax aggressiveness

Firm Size as a Moderating Variable

One of the metrics used to indicate the size of the company is the size. Assessments of company's size are typically based on total assets, total revenue, and average sales volume generated over a specific period of time (Dewi & Estrini, 2024). According to Wardani & Puspitasari (2022), there is a correlation between a company's size and the assets. The larger the company, the more assets it has. Large companies are typically subject to greater government oversight because they generate substantial profits. The government requires them to fulfil their tax obligations in accordance with applicable laws. This is related to differences in how management at large and small companies make financial and tax decisions (Harnovinsah et al., 2025).

The Moderating Role of Firm Size on ESG and Tax Aggressiveness

Big companies tend to attract more attention from regulators, investors and the public due to their size and economic effect. Such a tough climate pushes these businesses to protect their corporate reputation and improve transparency by implementing ESG standards. The larger a company becomes, the greater the need for solid governance and to be answerable to stakeholders. Thus, the effect of ESG measures on aggressive tax practices is expected to be stronger in larger companies than in smaller companies. Considering that, the study of Mukhtaruddin et al. (2025) shows that ESG has a negative effect on tax aggressiveness. Based on these findings, the following hypothesis is formulated:

H4: Firm size moderates the effect of ESG on tax aggressiveness

The Moderating Role of Firm Size on Profitability and Tax Aggressiveness

Higher profits mean higher taxes. That is a common reason

why management will try to reduce the tax burden through tax planning. Larger companies are in a better position as they have the financial capital, specialist tax professionals and sophisticated management systems required to create complex tax plans that smaller enterprises are unable to handle. These improved resources are expected to make business size amplify the favorable effect of big earnings on aggressive tax behaviours. This view is supported by a study by Hendayana et al. (2024), which reveals that firm size is a key moderating factor in the relationship between profitability and tax aggressiveness.

H5: Firm size moderates the effect of Profitability on tax aggressiveness

The Moderating Role of Firm Size on Leverage and Tax Aggressiveness

To determine the extent of a company's reliance on loans to finance its assets, analysts typically use the debt to assets ratio (DAR). A high DAR indicates that the company chooses to finance the majority of its operating assets using borrowed funds rather than equity. This strategy of heavy reliance on debt leads to higher annual interest expenses, which, under tax accounting regulations, can reduce a company's taxable income and thereby lower its tax liability.

According to principal agency theory, the use of borrowed capital is also associated with the management's desire to reconcile the interests of shareholders and creditors. Big organizations usually have better access to external sources of finance, more complicated organisational structures and more competence in dealing with financial risk and tax strategies than small enterprises. This makes it easier for big enterprises to make the most of the tax benefits of debt financing. The effect of leverage on tax aggressiveness is stronger in large companies because large companies have more ability to organize their financing and involve in debt-based tax planning.

Moreover, the results of Hendayana et al. (2024) suggest that firm size moderates the effect of leverage on tax aggressiveness, which means that the influence of leverage on tax aggressiveness changes with firm size. Therefore, the hypothesis:

H6: Firm size moderates the effect of Leverage on tax aggressiveness.

Based on the discussion above, the conceptual framework of this study is presented in Figure 1.

Methods

This study employs a quantitative research approach using secondary data obtained from the annual reports of companies

Table 2. Operational Variables

Variable	Measurement	Scale
Tax Aggressiveness	$= \frac{\text{Cash paid for Profit before tax}}{\text{(Pratomo \& Wibowo, 2024)}}$	Ratio
ESG	$\text{0-100 (Refinitiv, 2024)}$	Ratio
Profitability	$= \frac{\text{Net income}}{\text{Total asset (Hidayah, 2024)}}$	Ratio
Leverage	$= \frac{\text{Total debt}}{\text{Total asset (Apriliana, 2022)}}$	Ratio
Firm Size	$= \text{Ln (Total asset) (Dewi \& Estrini, 2024)}$	Ratio

Source: Data processed by the author (2026)

listed on the Indonesia Stock Exchange (IDX) and the Refinitiv database. The observation period covers the years 2020–2024.

The sample consists of companies that consistently published annual report and ESG data during the observation period, resulting in balanced panel dataset.

The dependent variable in this study is tax aggressiveness, proxied by Cash Effective Tax Rate (CETR). The independent variables include ESG Performance proxied by ESG Combined Score, profitability proxied by Return on Assets (ROA) and leverage proxied by Debt to Assets Ratio (DAR). Firm size is included as a moderating variable and is measured using the natural logarithm of total assets.

Panel data regression is employed to examine the relationship between variables. The estimation begins with the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). As explained by Basuki (2021), a sequential testing procedure using Chow test, Hausman test and Lagrange Multiplier test (LM) was used to choose among these alternatives. The Chow test determines whether the Common Effects Model or the Fixed Effects Model better fits the data, the Hausman test distinguishes between Random Effects and Fixed Effects and the LM test determines whether Random Effects significantly improve efficiency if the Hausman Test shows that the better models is Random Effect Model. But if the results of the chow test and hausman test shows that the better models are Fixed Effect Model (FEM), therefore the Lagrange Multiplier test (LM) test was not performed. The final model is estimated using the selected panel data regression approach, with robustness ensured through classical assumption tests, including multicollinearity and heteroscedasticity diagnostics. This research use Fixed Effect Model as the best model version and Eviews 13 software was employed to conduct all statistical analyses. The moderating effect of firm size was evaluated using moderated regression analysis (MRA), which incorporates ESG factors, profitability, debt ratios, and firm size to account for interaction terms. The t-statistics and p-values were used to assess the significance of these relationships at a 5% significance level.

Operationalization of Variables

To provide a clear understanding of how each variable is measured, Table 2 presents the operational definition, measurement formula, and scale for each variable used in this study.

Research Type

This research adopts a quantitative research design with an explanatory approach. The objective of this design is to examine the effect of Environmental, Social, and Governance

(ESG), profitability and leverage on tax aggressiveness, while examining firm size as a moderating factor.

The study's population encompasses all entities listed on the Indonesia Stock Exchange (IDX) throughout the 2020–2024 timeframe. Data acquisition relied on documentation methods, drawing from official IDX records and corporate reports. Panel data analysis was deemed optimal as it integrates cross-sectional and time-series observations, thereby enhancing data richness and the efficiency of statistical estimations (Wooldridge, 2021).

Population and Sample

The study's population encompasses every entity listed on the IDX with in the 2020–2024 timeframe. As of 2024, the IDX recorded approximately 947 listed companies, representing 12 sectors. Through purposive sampling, investigators can curate observations by applying specific criteria that align directly with the study's objectives (Sekaran & Bougie, 2016). The sampling process applied several criteria to obtain a representative sample. First, the companies had to be listed continuously on the IDX during the 2020–2024 period. Second, the companies were required to have Environmental, Social, and Governance (ESG) Combined Scores available in the Refinitiv database. Third, companies experiencing losses during the observation period were excluded because negative earnings may affect the calculation and interpretation of tax aggressiveness proxies. Following the exclusion of firms that failed to meet the specified criteria, the final dataset comprised 41 companies. Spanning a five-year observation window, this yielded a total of 205 firm-year observations, which served as the basis for the subsequent statistical analysis.

Research Location

This research was conducted within the Indonesian capital market, focusing on publicly listed entities across diverse industrial sectors from 2020 to 2024. The study leveraged secondary data sourced from the IDX database and Refinitiv. Specifically, financial metrics including profitability, leverage, tax aggressiveness, and firm size were extracted from corporate annual reports and financial statements. Conversely, ESG scores were retrieved directly from Refinitiv. Consequently, the IDX-listed companies constitute the primary locus of this investigation, serving as the foundational source for all analyzed data.

Instrumentation or Tools

To assess the study's variables, secondary data instruments were utilized. Corporate sustainability performance was quantified via the ESG Combined Score from the Refinitiv database, a metric that synthesizes standard ESG ratings with controversy assessments for a holistic evaluation. Profitability was proxied by Return on Assets (ROA), derived by dividing net income by total assets, while leverage was gauged using the Debt-to-Asset Ratio (DAR), representing the share of total liabilities relative to total assets. Furthermore, tax aggressiveness was measured through the Cash Effective Tax Rate (CETR) computed as cash taxes paid divided by pre-tax income and firm size was operationalized as the natural logarithm of total assets.

For the years spanning 2020 to 2024, this research drew upon annual filings, financial disclosures, and sustainability documents from firms listed on the IDX. Environmental, social, and governance metrics were sourced from Refinitiv, while figures needed to assess profitability, debt levels, tax aggressiveness, and company scale came directly from reports hosted on the IDX official portal. After gathering these datasets, the team employed EViews software to conduct panel data regression and MRA, thereby evaluating the study's central hypotheses (Baron & Kenny, 1986).

Data Collection

Data were collected using the documentation method through the systematic gathering and processing of information related to the research variables from companies' annual reports and ESG databases within this analytical framework, tax aggressiveness serves as the dependent variable and is evaluated using the Cash Effective Tax Rate (CETR) as a proxy. The independent variables comprise Environmental, Social and Governance (ESG) performance, profitability and leverage. ESG is quantified using the ESG Combined Score, while profitability and leverage are proxied by Return on Assets (ROA) and Debt to Assets Ratio (DAR), respectively. Additionally, firm size acts as the moderating variable and is operationalized by calculating the natural logarithm of the company's total assets.

Data Analysis

Descriptive statistics and panel data regression constitute the principal analytical procedures, with all computations executed in EViews 13. The panel data regression approach is well-suited to the study design because it enables simultaneous modelling of both the cross-sectional and time-varying dimensions of the dataset within a single estimation framework. Descriptive analysis characterizes each variable's distributional properties by reporting its minimum, maximum, mean, and standard deviation.

Model specification follows a three-stage protocol applying the Chow, Hausman, and Lagrange Multiplier tests to determine the most suitable estimator from among the CEM, FEM, and REM. Diagnostic procedures address two potential threats to inference quality: multicollinearity testing evaluates inter-predictor correlations that could destabilize coefficient estimates, while heteroscedasticity testing verifies the homogeneity of residual variance across observations.

Result and Discussion

Descriptive Statistical Analysis

To establish a preliminary understanding of the research variables and their distribution patterns, descriptive statistical methods were applied. The analysis reports key metrics such as the count of observations, minimum and maximum values, averages, and standard deviations. The final sample consisted of 41 companies listed on the Indonesia Stock Exchange from various industries that met the selection criteria. The resulted in a total of 205 company observations during the 2020-2024. These sampling criteria are detailed in Table 3.

According to Table 4, cash effective tax rate (CETR) is used to measure tax aggressiveness, which is shown to range from -0.3831 to 4.9763. The mean is 0.3577, and the standard deviation is 0.4967, as indicated by descriptive statistics. Some companies report negative tax payments or very high effective tax rates when CETR values are below 0 and above 1. The mean value of 0.3577 is representative of the average level of tax aggressiveness in the companies studied, where lower CETR values indicate higher levels of tax aggressiveness. On the other hand, the standard deviation of 0.4967 shows quite a large variation in the tax behaviour of the company during the observation period.

The ESG scores span a range from 16.4223 up to 88.8998, averaging 56.0321 with a standard deviation of 18.7862. Profitability figures vary between 0.0011 and 0.4543, showing an average of 0.0736 and a standard deviation of 0.0677. In contrast, leverage values fall between 0.0810 and 0.8911, yielding a mean of 0.4658 and a standard deviation of 0.2214. Finally, firm size measures between 29.3972 and 35.4255, with an average of 31.9242 and a standard deviation of 1.3685.

Firm size ranges from 29.3972 to 35.4255 and has a mean value of 31.9242 with a standard deviation of 1.3685. The average value suggests that the sample is dominated by medium to large firms. Moreover, the relatively low standard deviation indicates a fairly similar distribution of firm size among the companies included in the study.

Table 5 reveals that every independent variable exhibits a Centered VIF score under 10. This outcome confirms the absence of multicollinearity within the research model, signifying that no strong intercorrelations exist among the predictors. Consequently, all independent variables incorporated in this study are suitable for subsequent analysis and will yield reliable estimates in the regression framework.

Multicollinearity Test

Heteroscedasticity Test

Widarjono (2013) notes that heteroscedasticity occurs when the variance of the error terms in a regression analysis is not evenly distributed across the independent variables. This can lead to incorrect standard errors, incorrect hypothesis tests and incorrect predictions. The white test assesses the significance of the Probability Chi-Square from the Obs*R-squared value (Sugiyono, 2023). If the Probability Chi-Square from the Obs*R-squared value is more than 0.05, the data not indicate the presence of heteroscedasticity.

Table 6 shows an Obs*R-squared probability of 0.7755 (>0.05). This finding confirms that the model is free from heteroscedasticity issues. The result implies a constant variance in residuals across all observations, satisfying the homoskedasticity assumption and validating the model for subsequent analysis.

Chow Test

Table 7 shows that the probability values for both the Cross-section F statistic (3.411882) and the Cross-section Chi-square statistic (126.441945) equal 0.0000. Since these p-values fall below the 0.05 significance threshold, the FEM is deemed statistically superior to the CEM.

Hausman Test

Consistent with Table 8, the Cross-section random Chi-Square statistic registers a value of 24.458686 and a probability of 0.0001. Given that this p-value falls below the 0.05 significance threshold, the FEM is statistically preferred over the REM.

Panel Data Regression Analysis

Two regression specifications were constructed to assess how ESG, profitability, and leverage influence tax aggressiveness. The first model isolates the direct impacts of these three factors on tax aggressiveness. The second model expands the analysis by adding firm size and interaction terms to evaluate its moderating effect. Detailed findings from both regressions appear in Table 9.

The findings indicate that ESG does not significantly impact tax aggressiveness in either regression specification. In Model 1, the coefficient for ESG stands at 0.004650 with a probability value of 0.3576. Upon introducing firm size and interaction terms in Model 2, this coefficient shifts to -0.021717, accompanied by a probability value of 0.8263. Although the relationship direction changes to negative, the effect remains statistically insignificant because the p-value surpasses the 0.05 threshold. Because the dependent variable is measured with CETR, these results suggest that ESG does not significantly effect companies' cash tax payments, and hence, does not considerably affect tax aggression. Consequently, the first hypothesis (H1) is rejected, confirming that tax aggressiveness is not meaningfully driven by ESG factors.

The findings reveal that profitability does not significantly drive tax aggressiveness across either regression specification.

Table 3. Sampling Criteria

No	Criteria	Total
1	Companies that have been consistently listed on the Indonesia Stock Exchange during the 2020-2024 periode	947
2	Companies that do not have an ESG combined score on Refinitiv for the 2020-2024 periode	(900)
3	Companies that incurred losses during the 2020-2024 period	(6)
	Total number of companies that meet the criteria	41
	Total number of observations (41 companies x 5 years)	205

Source: Data processed by the author (2026)

Table 4. Descriptive Statistics of Research Variables

	TAX AGGRESSIVENESS	ESG	PROFITABILITY	LEVERAGE	FIRM SIZE
Mean	0.357669	56.03207	0.073593	0.465750	31.92418
Median	0.246000	57.05820	0.057400	0.433600	31.62540
Maximum	4.976300	88.89980	0.454300	0.891100	35.42550
Minimum	-0.383100	16.42230	0.001100	0.081000	29.39720
Std. Dev.	0.496723	18.78621	0.067694	0.221385	1.368544

Source: Data processed by the author (2026)

Table 5. Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.195524	988.5630	NA
ESG	4.78E-06	13.80920	1.389310
PROFITABILITY	0.337080	2.780590	1.271018
LEVERAGE	0.040050	8.798930	1.615173
FIRM_SIZE	0.001349	1138.760	2.078706

Source: Data processed by the author (2026)

Table 6. Heteroscedasticity Test

Test Statistic	Nilai		Prob.
F-statistic	0.682498	Prob. F (14,190)	0.7898
Obs*R-squared	9.815692	Prob. Chi-Square (14)	0.7755
Scaled explained SS	204.1437	Prob. Chi-Square (14)	0.0000

Source: Data processed by the author (2026)

Table 7. Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.411882	(40,160)	0.0000
Cross-section Chi-square	126.441945	40	0.0000

Source: Data processed by the author (2026)

Table 8. Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	24.458686	4	0.0001

Source: Data processed by the author (2026)

In Model 1, the profitability coefficient is -1.742188 with a p-value of 0.0545, indicating statistical insignificance. When firm size and interaction terms are added in Model 2, the coefficient flips to 6.730780 while the p-value rises to 0.8395. Although the sign of the relationship shifts from negative to positive, the association remains statistically insignificant as the p-value exceeds the 0.05 threshold. Consequently, the second hypothesis (H2) is rejected, confirming no meaningful link between profitability and tax

aggressiveness.

The findings demonstrate that leverage exerts a significant influence on tax aggressiveness. In Model 1, the coefficient stands at -0.621057 with a probability value of 0.4404, indicating no initial significance. However, once firm size and interaction terms are integrated into Model 2, the coefficient surges to 54.211640, accompanied by a statistically significant p-value of 0.0161. This positive coefficient implies that higher leverage is related with a larger CETR, hence indicating higher cash tax payments compared to pre-tax income, since the dependent variable is measured by the CETR. Hence, this finding supports less tax aggressiveness and not more tax aggressiveness. Therefore, the empirical outcome does not support the third hypothesis (H3) of the positive effect of leverage on tax aggression.

The interaction term between ESG and firm size (EF) yields a coefficient of 0.000414 and a p-value of 0.8932 regarding moderating effects. Since this probability value surpasses the 0.05 threshold, the moderation is statistically insignificant. This finding implies that corporate scale does not alter the link between ESG and tax aggressiveness. Essentially, the influence of ESG on tax aggressiveness remains stable regardless of company size. Therefore, the fourth hypothesis (H4) is rejected.

The interaction between profitability and firm size (PF) produces a coefficient of -0.318763 with a corresponding probability value of 0.7629. This moderating effect is statistically insignificant because the p-value exceeds the 0.05 threshold, even though the coefficient itself is negative. These results suggest that corporate scale does not alter the connection between tax aggressiveness and profitability. Accordingly, the fifth hypothesis (H5) is rejected, confirming that firm size does not moderate the impact of profitability on tax aggressiveness.

In contrast, the interaction between leverage and firm size (LF) yields a coefficient of -1.758681 and a probability value of 0.0140. This moderating effect is statistically significant since the p-value falls below the 0.05 threshold. The negative sign on the interaction term indicates that firm size attenuates the positive link between leverage and tax aggressiveness. Specifically, as corporate scale grows, the impact of leverage on aggressive tax planning weakens. This occurs because larger companies often face heightened public scrutiny and stricter oversight, which reduces their motivation to utilize debt for such purposes. Therefore, the sixth hypothesis (H6) is supported, confirming that firm size significantly alters the relationship between tax aggressiveness and leverage.

In summary, the regression analysis reveals that neither ESG nor profitability significantly drives tax aggressiveness, while leverage demonstrates a notable positive influence within the moderated framework. Furthermore, corporate scale fails

Table 9. Regression

Variable	Model 1	Model 2
ESG	0.00465 0.3576	-0.021717 0.8263
Profitability	-1.742188 0.0545	6.73078 0.8395
Leverage	-0.621057 0.4404	54.21164 0.0161
Firm_Size		1.632057 0.0000
EF		0.000414 0.8932
PF		-0.3188 0.7629
LF		-1.7587 0.0140
Constant	0.514586	-49.80262
R ²	0.400347	0.489787
Adj. R ²	0.240192	0.337048
Prob (F-statistic)	0.000019	0.000000

Source: Data processed by the author (2026)

to moderate the impacts of ESG and profitability on tax aggressiveness; however, it plays a significant moderating role in the connection between leverage and tax aggressiveness.

ESG and Tax Aggressiveness

The findings reveal that ESG metrics have no significant bearing on tax aggressiveness. This implies that a company's sustainability performance does not inherently dictate its propensity to adopt aggressive tax planning strategies.

Companies with strong ESG performance are generally expected to avoid aggressive tax practices. However, the insignificant relationship found in this study indicates that ESG activities and tax policies may represent separate dimensions of corporate decision-making.

One possible explanation is that ESG implementation among Indonesian firms is primarily aimed at fulfilling regulatory requirements and enhancing corporate legitimacy rather than influencing tax planning strategies. Companies with higher ESG scores may focus more on sustainability reporting and reputation management without changing their tax behavior. This finding supports the argument of [Ekawati \(2025\)](#), who found that ESG responsibility does not always reflect ethical corporate behavior because ESG practices may coexist with opportunistic managerial actions, known as the halo effect.

Also found that ESG performance is not consistently associated with tax aggressiveness among Indonesian listed companies, suggesting that ESG initiatives do not necessarily constrain firms from adopting tax planning strategies. Therefore, ESG performance alone cannot be considered a determinant of tax aggressiveness.

Profitability and Tax Aggressiveness

The evidence indicates that profitability exerts no significant influence on tax aggressiveness. This suggests that firms with elevated profits do not inherently pursue more aggressive strategies to lower their tax obligations. From the perspective of agency theory, managers are tasked with maximizing shareholder value, a goal often pursued by reducing tax expenditures. However, highly profitable firms may prioritize maintaining corporate reputation and regulatory compliance rather than pursuing aggressive tax strategies.

This insignificant relationship may be explained by the institutional diversity across sectors on the Indonesia Stock Exchange, exposing firms to disparate regulatory oversight

and stakeholder scrutiny. Consequently, for more profitable corporations, the incentive to engage in aggressive tax planning is diminished because the projected costs related to regulatory backlash and reputational loss surpass the incremental benefits of tax minimization.

This outcome aligns with [Noviyanti et al. \(2024\)](#) who found that profitability does not significantly drive tax aggressiveness within Indonesian corporations. Similarly, [Supriyatno et al. \(2025\)](#) observed no substantial link between profitability and tax aggressiveness among firms listed on the Indonesia Stock Exchange. Consequently, it appears that corporate tax planning strategies are shaped by determinants other than profit levels.

Leverage and Tax Aggressiveness

The analysis indicates a positive relationship between leverage and tax aggressiveness. Companies with elevated leverage levels often lower their taxable income by leveraging these debt-related shields, consequently heightening their tax aggressiveness.

Agency theory also explains that managers may employ debt financing as a mechanism to maximize firm value by reducing tax liabilities. Since interest expenses are tax deductible, firms with greater leverage have stronger incentives to engage in tax planning activities. Therefore, debt policy becomes an important determinant of tax aggressiveness.

This finding is in line with [Ekawati \(2025\)](#), who found that leverage significantly affects tax aggressiveness. Furthermore, previous studies generally indicate that debt financing creates opportunities for firms to minimize their tax burden through interest deductions, thereby increasing the likelihood of aggressive tax behavior.

The Moderating Role of Firm Size on ESG and Tax Aggressiveness

The findings demonstrate that corporate scale fails to moderate the link between ESG and tax aggressiveness. This implies that the influence of ESG on aggressive tax planning remains stable across firms of varying sizes. Large firms generally possess more resources and disclose more ESG information than smaller firms; however, differences in firm size do not alter the impact of ESG performance on tax behavior.

This finding implies that ESG policies and tax strategies are implemented independently of firm size. Consequently, both large and small companies exhibit similar patterns regarding the relationship between ESG and tax aggressiveness. The result is also consistent with the view that ESG disclosure is primarily intended to enhance legitimacy rather than influence tax planning decisions ([Gunadi et al., 2025](#)).

The Moderating Role of Firm Size on Profitability and Tax Aggressiveness

The analysis reveals that corporate scale does not moderate the connection between profitability and tax aggressiveness. Even though larger entities typically hold more resources and advanced tax planning capabilities, the impact of profitability on aggressive tax behavior remains statistically insignificant regardless of firm size. This suggests that the link between profit levels and tax conduct is consistent across companies of all scales.

The result is consistent with [Supriyatno et al. \(2025\)](#), who found that firm size does not moderate several determinants of tax aggressiveness. In highly regulated industries such as financial services, regulatory oversight may reduce the ability of firms to exploit profitability differences through aggressive tax practices.

The Moderating Role of Firm Size on Leverage and Tax Aggressiveness

The analysis demonstrates that corporate scale

significantly moderates the link between leverage and tax aggressiveness. The negative sign on the interaction term implies that larger firm size dampens the positive influence of leverage on aggressive tax practices. This suggests that as companies grow in size, their inclination to utilize high debt levels for aggressive tax planning diminishes.

Agency theory explains that larger firms are subject to stronger monitoring by investors, regulators, and the public. Large firms also face higher political costs and reputational risks, which may discourage managers from excessively exploiting debt financing for tax-saving purposes. Therefore, although debt provides tax benefits, larger firms tend to adopt more conservative tax policies.

Hendayana et al. (2024) found that firm size amplifies the effect of leverage on tax aggressiveness. This outcome aligns with Wijoyo et al. (2025), who established that corporate scale functions as a moderating factor in clarifying how leverage influences tax aggressiveness. Consequently, firm size acts as a dampening moderator that constrains the positive effect of debt on aggressive tax strategies.

Limitations and Recommendations

Several limitations should be acknowledged when evaluating the results of this study. First, the sample is confined to 41 businesses listed on the Indonesia Stock Exchange (IDX) that have data on ESG Combined Scores in the Refinitiv database and positive pre-tax income in the observation period 2020-2024, hence producing 205 firm-year observations. The study initially included 947 listed firms throughout the observation period, however 47 companies with relevant ESG Combined Score data and six companies reporting losses were eliminated. The need to exclude loss-making enterprises is due to the fact that the Cash Effective Tax Rate (CETR) does not have a common interpretation when pre-tax income is negative, which could lead to distorted or meaningless measurements of tax aggressiveness. The results are interpreted in the context of the sample used and may not be generalizable to all companies listed on the IDX. Second, the study utilizes secondary data from annual reports and Refinitiv database. Therefore, the quality of the study is contingent upon the completeness and consistency of the information supplied by each company. Third, the measure of tax aggressiveness used is only the Cash Effective Tax Rate (CETR), which may not represent all aspects of company tax avoidance activity. Finally, this analysis only considers business size as a moderating element, although other corporate governance procedures or institutional factors may also affect the relationship between ESG, profitability, leverage and tax aggression.

Scholars are urged to broaden the scope of future research by incorporating firms from diverse international markets or extending the temporal window to improve the external validity of these findings. Additionally, subsequent investigations could explore alternative moderating or mediating factors, such as corporate governance frameworks, political ties, ownership patterns, board composition, institutional holdings, or audit quality, to provide deeper insights into the nexus between ESG performance and tax aggressiveness. Further work might also contrast various ESG metrics, including pillar-specific scores or ratings derived from different data providers, to verify the robustness and

consistency of the empirical outcomes.

Conclusion

This study investigates the impacts of Environmental, Social, and Governance (ESG) performance, profitability, and leverage on tax aggressiveness—proxied by the Cash Effective Tax Rate (CETR)—alongside the moderating influence of firm size among entities listed on the Indonesia Stock Exchange from 2020 to 2024. The empirical evidence reveals that both ESG performance and profitability lack a statistically significant relationship with CETR, implying that differences in sustainability commitments and financial returns do not systematically explain variations in cash tax disbursements during the analyzed timeframe. Similarly, leverage remains insignificant in the baseline model. However, upon the inclusion of the interaction term, leverage exerts a positive and statistically significant effect. Given the direct scale of CETR—where an elevated rate denotes diminished tax aggressiveness—this finding demonstrates that higher leverage corresponds to more conservative tax behavior. Furthermore, this dynamic is contingent upon firm size, suggesting that larger enterprises adopt less aggressive tax postures despite the debt-shield advantages of financing. Conversely, the moderating capacity of firm size is non-significant regarding the effects of ESG and profitability on CETR, potentially reflecting deep-seated sectoral heterogeneity across listed firms characterized by distinct regulatory exposures, governance frameworks, and financial architectures.

These insights contribute to Agency Theory by illustrating that executives in larger corporations can be discouraged from manipulating debt for opportunistic tax planning purposes through the implementation of enhanced stakeholder supervision and robust external monitoring. However, it is important to exercise caution when considering these generalizations, as they are subject to certain research limitations. 205 firm-year observations encompassing the years 2020 to 2024 are derived from a sample of 41 enterprises with accessible ESG Combined Score data in the Refinitiv database, according to the empirical analysis. Consequently, the results may not accurately represent the entire population of companies that are listed on the Indonesia Stock Exchange. Additionally, CETR is the sole method used to quantify corporate tax aggressiveness, as it solely monitors actual cash tax expenditures and does not account for other aspects of corporate tax avoidance strategies. Consequently, prospective investigators are encouraged to implement alternative metrics for tax aggressiveness, integrate more comprehensive ESG datasets, and incorporate unique institutional or governance factors in order to provide a more comprehensive understanding of corporate tax practices.

Author contributions

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