

TAX MANAGEMENT IN ENERGY SECTOR: CSR DISCLOSURE AS MODERATOR AND PROFITABILITY AS MEDIATOR IN THE GOVERNANCE-FINANCE NEXUS

Mohamad Zulman Hakim^{1*}, Irsyad Ilham Dwi Febrian², Ubaidillah Fadhil Rohman³,
Ahmad Piyan⁴, Muhammad Denny Kurniawan⁵

^{1,2,3,4,5}Accounting Study Program, Faculty of Economics and Business, Universitas
Muhammadiyah Tangerang, Indonesia

*Corresponding Author:

mohamadzulmanhakim@ymail.com

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Abstract

This study examined the effects of capital intensity, leverage, institutional ownership, and independent commissioners on tax management, measured by the effective tax rate (ETR), in energy sector companies listed on the Indonesia Stock Exchange from 2021 to 2024. It also investigated the moderating role of Corporate Social Responsibility (CSR) disclosure and the mediating role of profitability, measured by Return on Assets (ROA). A quantitative approach was employed using panel data regression, Moderated Regression Analysis, and the Sobel test. The sample comprised 15 companies selected through purposive sampling from a population of 91 companies, yielding 60 observations. Secondary data were obtained from annual and sustainability reports. The results indicated that institutional ownership had a significant negative effect on ETR ($\beta = -1.230$, $p = 0.000$), whereas independent commissioners had a significant positive effect ($\beta = 1.294$, $p = 0.014$). Capital intensity and leverage had no significant effects. CSR disclosure strengthened the relationship between institutional ownership and ETR ($\beta = 1.137$, $p = 0.004$) but weakened the relationship between independent commissioners and ETR ($\beta = -1.644$, $p = 0.015$). Profitability mediated only the relationship between capital intensity and ETR (Sobel $t = 2.33$). The adjusted coefficient of determination was 33.21%, indicating that the model explained 33.21% of the variation in ETR. These findings highlighted the importance of corporate governance and CSR disclosure in shaping tax practices, while profitability provided a mediating mechanism linking capital intensity to tax management.

Keywords: Corporate Governance, Financial Ratios, CSR Disclosure, Tax Management

1. Introduction

Taxation is a key driver of national prosperity, serving as the government's main revenue source to finance development, social security, and public services (Umami & Aryani, 2023). However, disputes frequently occur between businesses, which use a variety of tax management techniques to reduce tax payments, and the government, which seeks to maximize tax collection. Tax management is the process by which companies organize, execute, and monitor their tax payments, and businesses use tax management in an effort to pay as little tax as feasible while remaining compliant with applicable regulations. In this study, tax management is measured using the effective tax rate (ETR), which represents the amount of tax that a company actually pays relative to its pre-tax profit. Tax management is considered effective when the ETR is equal to or lower than the statutory tax rate (STR), as this indicates the company's tax aggressiveness. The closer



the ETR is to the STR, the better, because it means the company is paying the appropriate amount of tax. If the ETR is higher than the STR, it shows that the company is not managing taxes well and is not meeting the expected tax rate (Amanda et al., 2025). Based on Section 17(2a) of Act 38/2008, the corporation tax rate was 28 percent in 2009 and dropped to 25 percent in 2010. The tax rate was lowered once again to 22 percent for the 2020–2021 tax year under Section 5(1) of Law No. 2 of 2020, and according to HPP Law No. 7/2021, this 22 percent rate has been in place from the 2022 tax year to the present.

A tax avoidance case happened at PT Adaro Energy Tbk, a major coal company in Indonesia. Adaro is alleged to have avoided paying taxes by using transfer pricing. The company sold coal to its Singapore-based subsidiary, Coaltrade Services International, at prices lower than the usual market price, and then that coal was sold to other countries at higher prices. This practice occurred from 2009 to 2017 and caused the country to lose approximately US\$125 million in taxes that could have been collected, which is roughly US\$14 million each year. The effective tax rate of PT Adaro Energy from 2020 to 2024 illustrates the dynamics of tax management in this company, as presented in Table 1.

Table 1. ETR of PT Adaro Energy for the Period 2020–2024

Year	Description	Income Tax Burden	Profit Before Tax	ETR (%)	STR (%)
2020	In millions of rupiah	896,619	3,129,084	28.65	22
2021	In millions of rupiah	6,537,971	21,232,157	30.79	22
2022	In millions of rupiah	25,704,625	69,940,921	36.75	22
2023	In millions of rupiah	6,760,076	35,296,661	19.15	22
2024	In millions of rupiah	2,779,612	13,061,612	21.28	22

Source: Processed data from financial statements (2025)

Table 1 presents the effective tax rate of PT Adaro Energy from 2020 to 2024 compared to the statutory tax rate of 22 percent. Between 2020 and 2022, the company's ETR was higher than the STR, at 28.65 percent, 30.79 percent, and 36.75 percent, respectively. This shows that the company was not managing its tax obligations very well during those years, as it paid more tax than the statutory requirement. However, in 2023 and 2024, the ETR dropped to 19.15 percent and 21.28 percent, which is below the STR. This means the company improved its tax management in the last two years, bringing its effective tax rate closer to or below the statutory rate. Overall, the trend shows that PT Adaro Energy has made progress in managing taxes more efficiently in recent years, although the earlier years indicate significant variation in tax practices.

Several factors, including institutional ownership, can affect how taxes are managed. When organizations or other groups own a company's shares, this is known as institutional ownership, and it is connected to tax management because it helps supervise the company's management team (Amelia & Siregar, 2022). High institutional ownership strengthens investor influence, allows for closer management oversight, and encourages compliance with tax regulations. With significant shareholdings and access to company data, institutional investors can shape corporate strategy, including tax management decisions. Studies by Dewanti and Biduri (2024) indicate that institutional ownership negatively impacts ETR, whereas research by Sari and Puspa (2023) demonstrates a



positive influence on ETR. In contrast, findings from Verensia and Febrianti (2022) reveal no effect of institutional ownership on ETR.

Independent commissioners are people who do not hold director positions and are not connected to the company's management, shareholders, or board of commissioners (Hidayat & Muliasari, 2020). To ensure that the business's operations adhere to the law and its goals, independent commissioners supervise and counsel management. A higher proportion of independent commissioners improves company performance, including the development of effective tax strategies. With a dominant independent presence in oversight, executives can curb unethical tax practices (Hidayat & Husadha, 2021). Research by Dewanti and Biduri (2024) shows that independent boards of commissioners positively affect ETR, while studies by Mahanani et al. (2025) indicate a negative impact. Conversely, Erlina (2021) found no influence from independent boards of commissioners on ETR.

Leverage involves utilizing funds or capital that obligates the user to cover fixed expenses like interest (Apu & Ardini, 2023). This means employing extra capital to boost returns on investments or operations, though it entails the duty to settle fixed charges such as interest or other financial obligations. While leverage can enhance potential earnings, it also introduces risks tied to these mandatory payments (Rossa et al., 2024). In terms of ETR, firms with elevated leverage often exhibit reduced ETR due to deductible interest expenses. Yet, overreliance on debt heightens default risks, necessitating a balanced funding approach. Findings from Arliani (2023) indicate a positive influence of leverage on ETR, whereas Yulianty et al. (2021) report a negative effect, and Tanjaya and Nazir (2021) found no impact from leverage on ETR.

Capital intensity reveals the amount of money a business spends on fixed assets (Erma Wati et al., 2022). Over time, these assets lose value, and the accompanying expenses can reduce the company's tax obligation. Depreciation costs rise with larger fixed asset holdings, potentially lowering the effective tax rate. The efficiency with which fixed assets produce income is measured by capital intensity; a greater ratio denotes better asset utilization and lower tax obligations due to depreciation. Research findings vary: Darmawati et al. (2025) noted a negative influence on ETR, while Yumiarsi and Yanti (2024) showed a positive impact on tax management. According to Adrian et al. (2025), tax management is unaffected by capital intensity.

Corporate Social Responsibility Disclosure (CSRD) is a moderating variable in this study because it conveys the company's commitment to the environment and society while fostering credibility and public trust. The moderating role of CSRD has been the subject of conflicting findings in prior research. According to Dewanti and Biduri (2024), CSRD mitigates the effects of independent board members and institutional ownership on ETR, while other research shows that CSRD does not moderate either or both of these variables (Syakirah et al., 2025; Erlina, 2021). A similar contradiction is observed in the variables of leverage and capital intensity, where some research finds a moderating effect of CSRD (Zanra, 2022; Fransiska & Diarsyad, 2024), while others do not (Parwati & Isthika, 2024; Syakirah et al., 2025).

Since higher profitability raises taxable income, this study also incorporates profitability as a mediating variable that reflects financial performance and connects the independent variables to tax management. Previous research has produced contradictory results on profitability's role as a mediating variable. It has been demonstrated that the impact of institutional ownership is mediated by profitability (Sudiarto et al., 2022) and independent board of directors (Andora et al., 2025), but not in other studies (Tjahjono et



al., 2022; Sunarto et al., 2021). The same contradiction can be observed in the case of the variables of leverage and capital intensity, where some studies show the mediating effect of profitability, while other research has found the opposite result (Corina et al., 2022; Ma'roep, 2024; Mas'adah et al., 2024).

The urgency of this research is driven by several critical factors. First, taxation is a key driver of national prosperity and the government's main revenue source, yet disputes frequently occur between businesses seeking to minimize tax payments and the government seeking to maximize tax collection, making the study of tax management practices critical. Second, a tax avoidance case at PT Adaro Energy Tbk involving transfer pricing resulted in approximately US\$125 million in lost tax revenue between 2009 and 2017, highlighting the importance of understanding the determinants of tax management in the energy sector. Third, empirical evidence regarding institutional ownership, independent commissioners, leverage, and capital intensity on tax management remains inconclusive, with some studies reporting significant effects and others reporting insignificant or no relationship. Fourth, the moderating role of Corporate Social Responsibility Disclosure and the mediating role of profitability in these relationships remain underexplored, with contradictory findings in prior research. Fifth, the energy sector during the 2021–2024 period represents a unique context characterized by economic uncertainty, commodity price volatility, and evolving tax regulations, yet empirical evidence on the determinants of tax management in this sector remains limited.

Previous research has shown significant but fragmented findings regarding the determinants of tax management. Studies have demonstrated that institutional ownership significantly influences tax management (Dewanti & Biduri, 2024; Sari & Puspa, 2023), that independent commissioners affect tax management (Dewanti & Biduri, 2024; Mahanani et al., 2025), that leverage significantly affects tax management (Arliani, 2023; Yulianty et al., 2021), and that capital intensity influences tax management (Darmawati et al., 2025; Yumiarsi & Yanti, 2024). However, other studies have reported contradictory findings, indicating that institutional ownership does not significantly affect tax management (Verensia & Febrianti, 2022), that independent commissioners have no influence on ETR (Erlina, 2021), that leverage does not affect ETR (Tanjaya & Nazir, 2021), and that capital intensity has no significant effect on tax management (Adrian et al., 2025). Furthermore, the moderating role of CSRD and the mediating role of profitability also remain inconclusive, with some studies finding significant effects and others reporting no relationship (Dewanti & Biduri, 2024; Syakirah et al., 2025; Sudiarto et al., 2022; Tjahjono et al., 2022). These inconsistencies suggest that the relationships among institutional ownership, independent commissioners, leverage, capital intensity, CSRD, profitability, and tax management remain underexplored, particularly in the context of energy sector companies in Indonesia.

The research gap in this study lies in the limited understanding of how capital intensity, leverage, institutional ownership, and independent commissioners jointly influence tax management, particularly in the energy sector in Indonesia. While individual studies have examined the direct effects of these factors on tax management, the integrated framework connecting these factors with CSRD as a moderating variable and profitability as a mediating variable remains underexplored. Additionally, most previous studies have focused on various sectors or other periods, leaving a significant gap in knowledge regarding the dynamics of tax management in energy sector companies during the 2021–2024 period. Furthermore, empirical evidence on the determinants of tax management in



Indonesia remains limited, particularly in the context of increasing economic uncertainty and evolving governance practices.

The novelty of this research lies in several aspects. First, this study focuses on energy sector companies listed on the Indonesia Stock Exchange during the 2021–2024 period, representing a unique context characterized by economic uncertainty, commodity price volatility, and evolving tax regulations. Second, this study develops an integrative model that simultaneously examines the influence of capital intensity, leverage, institutional ownership, and independent commissioners on tax management, with CSRD as a moderating variable and profitability as a mediating variable, providing a more comprehensive understanding of the determinants of tax management in the energy sector. Third, this study contributes to the limited empirical evidence on tax management in the energy sector, providing insights into how governance mechanisms, financial ratios, CSR disclosure, and profitability collectively influence tax management. Fourth, this study extends the application of Agency Theory to the context of tax management in Indonesia, validating theoretical predictions in an under-researched institutional context. Fifth, this study provides actionable insights for investors, policymakers, tax authorities, and company management in designing effective strategies to enhance tax compliance and governance practices.

The purpose of this study is to examine the effect of capital intensity, leverage, institutional ownership, and independent commissioners on tax management in energy sector companies listed on the Indonesia Stock Exchange during the 2021–2024 period, with CSRD as a moderating variable and profitability as a mediating variable. Specifically, this research aims to analyze the effect of institutional ownership on tax management, analyze the effect of independent commissioners on tax management, analyze the effect of leverage on tax management, analyze the effect of capital intensity on tax management, analyze the moderating role of CSRD in these relationships, and analyze the mediating role of profitability in these relationships. The choice of this goal was driven by the limited understanding of how these factors collectively influence tax management and the need for empirical evidence that can inform investors, policymakers, tax authorities, and company management in designing effective strategies to enhance tax compliance and governance practices.

The contribution of this research is multifaceted. From a theoretical perspective, this research contributes to the enrichment of literature on taxation and corporate governance by proposing and testing an integrative model that links capital intensity, leverage, institutional ownership, and independent commissioners with tax management, incorporating CSRD as a moderating variable and profitability as a mediating variable, extending the application of Agency Theory to the context of tax management in Indonesia. The findings contribute to the understanding of how governance mechanisms, financial ratios, CSR disclosure, and profitability influence tax management, providing a more nuanced theoretical framework for analyzing tax practices in the energy sector. From a practical perspective, this study provides actionable insights for investors, policymakers, tax authorities, and company management in assessing and managing tax risk. For investors, the findings provide guidance on which factors should be considered in evaluating a company's tax management practices. For policymakers and tax authorities, the results offer insights into the factors affecting tax compliance and the importance of governance mechanisms and CSR disclosure in shaping tax practices. For company management, the results offer insights into the importance of good corporate governance and transparent CSR disclosure in maintaining tax compliance and avoiding



aggressive tax practices. For academics, this study contributes to the growing body of literature on taxation and corporate governance, providing a foundation for future research on tax management.

2. Theoretical Background

2.1 Agency Theory

Agency Theory explains how agents, such as managers or executives, interact with principals, such as owners or shareholders, and illustrates how the goals of these two parties may not always align (Jensen & Meckling, 1976). According to this theory, mismatched aims lead to conflicts between principals and agents. Agents may not always agree with the principals' wishes because managers typically have greater knowledge about the company's present situation and its future consequences than the owners do. In this study, institutional ownership, independent commissioners, leverage, capital intensity, CSRD, and profitability function as monitoring mechanisms and signals that reduce agency conflicts and information asymmetry between management and shareholders. The difference in interests between principals and agents is an issue that is often related to tax management. Agents seek to obtain higher compensation to boost their performance, while principals want to maintain their income by reducing their tax burden (Eti & Wikan, 2020). Agency issues or conflicts of interest between agents and principals may arise as a result of managers acting for their own personal benefit due to the leadership's delegation of responsibility in the company's administration. Within the Agency Theory framework, institutional ownership, independent commissioners, leverage, capital intensity, CSRD, and profitability function as important mechanisms that influence tax management. High institutional ownership strengthens investor influence and encourages compliance with tax regulations, while independent commissioners supervise management to ensure that tax decisions align with shareholder interests. Leverage and capital intensity reflect financial structures that may affect taxable income through interest expenses and depreciation, while CSRD enhances transparency and accountability, reducing information asymmetry between management and stakeholders. Profitability reflects financial performance that connects governance and financial factors to tax management. Accordingly, Agency Theory provides the theoretical foundation for this study by explaining how institutional ownership, independent commissioners, leverage, capital intensity, CSRD, and profitability influence tax management.

2.2 Tax Management

Tax management encompasses strategies for tax planning, execution, and oversight within a company. It represents steps taken by leadership to meet tax obligations effectively, aiming for favorable outcomes that lessen the tax load and boost corporate earnings (Tambunan & Malau, 2021). This practice aids firms in controlling their tax liabilities and steering clear of unlawful activities like tax evasion. By adopting suitable policies and accounting techniques, businesses can decrease their tax expenses and cut down on effective tax outlays, which can be evaluated based on the tax management strategies employed (Wijayanti & Muid, 2020). From the perspective of Agency Theory, agency issues in corporate tax management stem from conflicting interests among stakeholders. Managers (agents) aim to secure higher pay or bonuses through increased profits, while investors (owners) focus on reducing tax burdens to maximize their returns (Jensen & Meckling, 1976). In this study, tax management is measured using the effective



tax rate (ETR), which compares income tax expense to profit before tax. A lower ETR indicates more effective tax management, while an ETR closer to the statutory tax rate indicates better compliance. Empirical studies also support this relationship, with studies by Dewanti and Biduri (2024) and Amanda et al. (2025) finding that tax management is influenced by governance mechanisms and financial factors.

2.3 Institutional Ownership, Tax Management

The percentage of a company's shares held by organizations such as investment funds, brokerage houses, insurance companies, pension funds, and other financial institutions is known as institutional ownership (Sari & Simamora, 2025). Increased oversight of businesses with large institutional or governmental ownership forces management to maximize revenues and operate effectively. The effective tax rate (ETR) is positively impacted by this oversight because it improves governance, lessens agency issues, and prevents tax evasion. From the perspective of Agency Theory, conflicts between principals and agents call for supervision to prevent managers from acting in their own best interests (Jensen & Meckling, 1976). Strong oversight by institutional investors helps prevent aggressive tax evasion tactics. This analysis supports the research hypothesis, which holds that institutional ownership raises the effective tax rate. Empirical evidence supports this relationship, with studies by Dewanti and Biduri (2024) and Sari and Puspa (2023) finding that institutional ownership significantly influences tax management. However, other studies report contradictory findings, indicating that institutional ownership does not significantly affect tax management (Verensia & Febrianti, 2022). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H1: Tax management (ETR) is positively impacted by institutional ownership.

2.4 Independent Board of Commissioners, Tax Management

Independent commissioners form a key element of corporate governance and are characterized as individuals without ties to the company's directors, fellow board members, or primary shareholders (Fauziah & Sahara, 2025). They are selected to bolster the board's oversight role, making it more productive and accountable. Their involvement is intended to enhance the board's responsibility and performance (Safitri & Subroto, 2022). Independent commissioners represent investors by overseeing management and corporate strategies, including tax policies. They help reduce agency conflicts and ensure decisions align with shareholder interests, while strong oversight limits aggressive tax practices. From the perspective of Agency Theory, independent commissioners serve as monitoring mechanisms that reduce information asymmetry between management and shareholders (Jensen & Meckling, 1976). Research by Dewanti and Biduri (2024) demonstrated that independent commissioners affect the ETR, with their findings suggesting that maintaining at least 30 percent independent commissioners boosts corporate governance efficiency, leading to superior monitoring and decision-making by management. Empirical evidence supports this relationship, with studies by Mahanani et al. (2025) finding that independent commissioners significantly influence tax management. However, other studies report contradictory findings, indicating that independent commissioners have no influence on ETR (Erlina, 2021). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H2: Independent Board of Commissioners positively influences tax management (ETR).



2.5 Leverage, Tax Management

Leverage is the use of money borrowed from outside the company to support its investments and assets (Nurfitriani & Hidayat, 2021). Companies with high levels of leverage pay higher interest costs, which lower their taxable income. Leverage is therefore a technique for controlling taxes and reducing the total tax burden. According to earlier research by Yulianty et al. (2021), tax management is negatively impacted by debt levels. From the perspective of Agency Theory, managers can reduce tax burdens and the tax base by using interest expenses (Jensen & Meckling, 1976). Conflicts of interest may arise from this desire for efficiency, leading to the aggressive use of leverage to lower taxes. In this study, leverage is measured using the Debt-to-Equity Ratio (DER), which compares total debt to total equity. Empirical evidence supports this relationship, with studies by Arliani (2023) finding that leverage significantly influences tax management. However, other studies report contradictory findings, indicating that leverage does not affect ETR (Tanjaya & Nazir, 2021). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H3: The negative effect of leverage on tax management (ETR).

2.6 Capital Intensity, Tax Management

Investment activities involving the investment of capital in the form of fixed assets are referred to as capital intensity (Cahyamustika & Oktaviani, 2024). Increased fixed asset ownership results in higher depreciation costs, which reduce earnings and taxes due. As a result, higher capital intensity lowers the effective tax rate (ETR), a sign of increased tax avoidance. The effective tax rate (ETR) is negatively impacted by capital intensity, according to study by Darmawati et al. (2025). Tangible asset depreciation produces a write-off that is deductible from taxes. From the perspective of Agency Theory, management exploits this to boost productivity and legally lower tax obligations, which lowers the ETR (Jensen & Meckling, 1976). In this study, capital intensity is measured by the ratio of total fixed assets to total assets. Empirical evidence supports this relationship, with studies by Yumiarsi and Yanti (2024) finding that capital intensity significantly influences tax management. However, other studies report contradictory findings, indicating that capital intensity has no significant effect on tax management (Adrian et al., 2025). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H4: Tax management (ETR) is adversely affected by capital intensity.

2.7 CSR Disclosure Moderates the Relationship Between Institutional Ownership and Tax Management

Corporate Social Responsibility Disclosure (CSR/D) is a moderating variable in this study because it conveys the company's commitment to the environment and society while fostering credibility and public trust. From the perspective of Agency Theory, CSR/D functions as a monitoring mechanism that reduces information asymmetry between management and stakeholders (Jensen & Meckling, 1976). CSR/D significantly shapes tax management by empowering institutional investors to better oversee firms, particularly in tax-related matters. Research by Dewanti and Biduri (2024) indicates that institutional ownership affects tax management, with this influence intensifying in the presence of CSR. From an Agency Theory perspective, institutional ownership acts as a safeguard against managerial self-interest. Enhanced disclosure and monitoring through robust CSR/D encourage executives to adopt more prudent tax strategies. Moreover, the



level of institutional ownership reflects a firm's commitment to social, environmental, and economic responsibilities under the Triple Bottom Line framework (Dewi et al., 2022). Empirical evidence supports this relationship, with studies by Dewanti and Biduri (2024) finding that CSRD moderates the relationship between institutional ownership and tax management. However, other studies report contradictory findings, indicating that CSRD does not moderate this relationship (Syakirah et al., 2025). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H5: CSRD moderates the relationship between institutional ownership and tax management (ETR).

2.8 CSR Disclosure Moderates the Relationship Between Independent Board of Commissioners and Tax Management

Independent commissioners enhance transparency in CSR and promote ethical tax behaviors. CSR bolsters their supervisory function, thereby affecting the link between independent commissioners and tax management (ETR). Findings from Dewanti and Biduri (2024) reveal that CSRD mediates the influence of independent commissioners on tax management. From the perspective of Agency Theory, CSRD boosts clarity, enabling independent overseers to better assess managerial actions and reinforce control (Jensen & Meckling, 1976). This prompts executives to exercise greater caution in tax approaches, amplifying the role of independent commissioners in determining the ETR. Empirical evidence supports this relationship, with studies by Dewanti and Biduri (2024) finding that CSRD moderates the relationship between independent commissioners and tax management. However, other studies report contradictory findings, indicating that CSRD does not moderate this relationship (Erlina, 2021). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H6: The influence of the Independent Board of Commissioners on tax management (ETR) is moderated by CSRD.

2.9 CSR Disclosure Moderates the Relationship Between Leverage and Tax Management

Firms with strong corporate social responsibility tend to be more transparent and attentive to stakeholder needs, yet highly leveraged entities often resort to tax minimization to cut liabilities. Zanra (2022) argues that CSR can modify how debt affects tax management (ETR). CSRD diminishes the leverage's impact on ETR by improving oversight of debt utilization through CSR clarity. From the perspective of Agency Theory, this curbs opportunistic managerial conduct, rendering the leverage-tax management relationship more manageable (Jensen & Meckling, 1976). Empirical evidence supports this relationship, with studies by Zanra (2022) and Fransiska and Diarsyad (2024) finding that CSRD moderates the relationship between leverage and tax management. However, other studies report contradictory findings, indicating that CSRD does not moderate this relationship (Parwati & Isthika, 2024). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H7: CSRD moderates the relationship of leverage on tax management (ETR).

2.10 CSR Disclosure Moderates the Relationship Between Capital Intensity and Tax Management

Furthermore, a company's asset utilization influences tax management, as substantial fixed assets lead to greater depreciation deductions, reducing taxable income and thus tax



burdens. According to Fransiska and Diarsyad (2024), CSR can adjust the extent to which capital intensity affects tax management (ETR). The transparency afforded by CSRD facilitates monitoring of tangible assets for tax optimization. From the perspective of Agency Theory, this strengthens shareholder oversight, enabling better control over capital intensity's effect on ETR (Jensen & Meckling, 1976). Empirical evidence supports this relationship, with studies by Fransiska and Diarsyad (2024) finding that CSRD moderates the relationship between capital intensity and tax management. However, other studies report contradictory findings, indicating that CSRD does not moderate this relationship (Syakirah et al., 2025). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H8: CSRD moderates the influence of capital intensity on tax management (ETR).

2.11 Profitability Mediates the Relationship Between Institutional Ownership and Tax Management

A company's profitability, which gauges its capacity to generate earnings within a given timeframe, is shaped by factors such as sales figures, assets, and equity (Oktaviani et al., 2021). Investors closely track sales expansion as it informs investment decisions, with profitability often mirrored in ROA. Typically, rising profits lead to greater tax liabilities. From the perspective of Agency Theory, profitability reflects financial performance that connects governance and financial factors to tax management (Jensen & Meckling, 1976). Institutional ownership enhances corporate performance (ROA) and overall value through stronger governance and oversight. Aligning with Agency Theory, the link between institutional ownership and ETR is facilitated by elevated ROA, as better performance streamlines tax strategies. Studies by Sudiarto et al. (2022) indicate that profitability (ROA) acts as a mediator in the effect of institutional ownership on tax management (ETR). However, other studies report contradictory findings, indicating that profitability does not mediate this relationship (Tjahjono et al., 2022). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H9: The effect of institutional ownership on tax management (ETR) is indirectly influenced through profitability (ROA).

2.12 Profitability Mediates the Relationship Between Independent Board of Commissioners and Tax Management

Beyond institutional ownership, profitability influences tax management via the role of independent commissioners, who ensure that corporate strategies are executed effectively and ethically, preventing misuse of authority. Research by Andora et al. (2025) shows that the connection between independent commissioners and ETR is mediated by profitability (ROA). The supervision by independent commissioners boosts operational efficiency and tax practices by enhancing financial results and curbing managerial opportunism. From the perspective of Agency Theory, independent commissioners serve as monitoring mechanisms that reduce information asymmetry between management and shareholders (Jensen & Meckling, 1976). Elevated profitability correlates with a higher ETR and better tax adherence. Empirical evidence supports this relationship, with studies by Andora et al. (2025) finding that profitability mediates the relationship between independent commissioners and tax management. However, other studies report contradictory findings, indicating that profitability does not mediate this



relationship (Sunarto et al., 2021). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H10: Profitability (ROA) mediates the relationship of independent commissioners on tax management (ETR).

2.13 Profitability Mediates the Relationship Between Leverage and Tax Management

Profitability can also clarify the link between a firm's debt utilization and tax management. Businesses leverage debt to fund activities, potentially increasing earnings, the core goal of enterprises according to Susilawati and Purnomo (2023). Higher profits impact tax duties and provide resources for debt servicing. Thus, profitability mediates the relationship between leverage and the effective tax rate (ETR). From the perspective of Agency Theory, leverage can reduce tax burdens through interest expenses, but overreliance on debt may increase financial risk and reduce profitability (Jensen & Meckling, 1976). Findings from Corina et al. (2022) demonstrate that profitability (ROA) explains how debt affects tax management (ETR). However, other studies report contradictory findings, indicating that profitability does not mediate this relationship (Ma'roep, 2024). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H11: Profitability (ROA) mediates the influence of leverage on tax management (ETR).

2.14 Profitability Mediates the Relationship Between Capital Intensity and Tax Management

Additionally, profitability mediates the connection between capital intensity and tax management. Capital intensity indicates how effectively fixed assets contribute to earnings and signals a company's investment strength and growth potential. As agents, managers must optimize these assets to maximize returns for shareholders, though profit preservation might encourage certain tax approaches. From the perspective of Agency Theory, capital intensity can reduce tax burdens through depreciation, but effective asset utilization may enhance profitability and influence tax management (Jensen & Meckling, 1976). Evidence from Mas'adah et al. (2024) confirms that profitability (ROA) mediates the effect of capital intensity on tax management (ETR). However, other studies report contradictory findings, indicating that profitability does not mediate this relationship (Corina et al., 2022). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H12: Profitability (ROA) mediates the influence of capital intensity on tax management (ETR).

3. Methods

3.1 Research Design

This study employs a quantitative approach that combines statistical and numerical analysis to investigate correlations between different parameters. The quantitative approach is considered appropriate because the study aims to empirically test the proposed hypotheses using statistical analysis of numerical data derived from financial statements and sustainability reports. The associative-causal research design enables the examination of causal relationships between independent variables (institutional ownership, independent commissioners, leverage, and capital intensity) and the



dependent variable (tax management), with CSRD as a moderating variable and profitability as a mediating variable. Descriptive statistics, panel data regression, Moderated Regression Analysis (MRA), and Sobel tests for mediation are examples of analytical methods employed in this study. Excel and E-Views 12 were used for data processing. Using data from the IDX's official website, the study examined every energy sector company listed on the Indonesia Stock Exchange between 2021 and 2024.

3.2 Population and Sample

The population in this study consists of all energy-related companies registered on the Indonesia Stock Exchange between 2021 and 2024, totaling 91 companies. The energy sector was selected due to its significant contribution to national revenue, its sensitivity to commodity price fluctuations, and its relevance to tax management assessment. The purposive sampling technique involved choosing samples based on predetermined standards: (1) companies in the energy sector listed on the IDX during the 2021–2024 period; (2) companies that regularly released annual reports during the 2021–2024 period; (3) companies that did not experience losses (negative earnings) between 2021 and 2024; (4) companies with complete research variable data; and (5) companies that submitted sustainability reports between 2021 and 2024. Based on these criteria, the final sample includes 15 companies, resulting in 60 observations (15 companies × 4 years), as presented in Table 2.

Table 2. Company Sample Criteria

No.	Sampling Criteria	Amount
1.	Companies in the Energy Sector Listed on the IDX (2021–2024)	91
2.	Companies that do not regularly release annual reports (2021–2024)	(29)
3.	Companies that have lost money (negative earnings) between 2021 and 2024	(22)
4.	Companies that do not have complete research variable data	(19)
5.	Companies who fail to submit Sustainability Reports between 2021 and 2024	(6)
Final Sample Size of Companies		15
Research Period (Years)		4
Total Observations (N) (15 Companies × 4 Years)		60

Source: Processed data (2025)

3.3 Data Collection Techniques

The annual reports of energy sector companies registered on the Indonesia Stock Exchange, which are accessible to the public on www.idx.co.id, provided secondary data for the study. In order to ensure that all pertinent financial and non-financial data were appropriately recorded for analysis, the necessary information was gathered using documentation procedures by examining the sustainability reports and annual reports released by these companies for the 2021–2024 period. The data collection procedure involved several sequential steps: (1) identification of energy sector companies listed on the IDX during the 2021–2024 period; (2) selection of companies meeting the predetermined purposive sampling criteria; (3) collection of tax management data from financial statements, specifically income tax expense and profit before tax; (4) collection of institutional ownership data from annual reports, specifically the number of shares owned by institutions and total shares outstanding; (5) collection of independent



commissioner data from annual reports, specifically the number of independent board members and total number of board members; (6) collection of leverage data from financial statements, specifically total debt and total equity; (7) collection of capital intensity data from financial statements, specifically total fixed assets and total assets; (8) collection of CSRD data from sustainability reports based on GRI Standard 2021 indicators; (9) collection of profitability data from financial statements, specifically profit before tax and total assets; and (10) documentation of all extracted data systematically organized into a panel dataset suitable for statistical analysis. The secondary data sources employed in this research are considered reliable as they represent official publications from authorized institutions and established data providers.

3.4 Operational Definition of Variables

Table 3. Definition and Measurement of Variables

Variable	Definition	Indicator	Scale
Tax Management (Y)	Tax management is an effort made by companies to manage their tax obligations so that the tax burden paid can be minimized, while still complying with applicable tax regulations (Ghozali, 2021)	ETR = Income Tax Expense / Profit Before Tax	Ratio
Institutional Ownership (X ₁)	Institutional ownership is the percentage of a company's shares held by organizations like banks, insurance companies, pension funds, and investment firms (Chytia & Pradana, 2021)	KI = Number of shares owned by institutions / Total shares outstanding	Ratio
Independent Board of Commissioners (X ₂)	An independent commissioner is someone who has no affiliation with any party in the company and does not hold a directorship in the company concerned (Alkausar et al., 2021)	DKI = Number of independent board members / Total number of board members	Ratio
Leverage (X ₃)	Leverage is a measure of a business's capacity to consistently fulfill its commitments to pay back debts on schedule (Roslita & Erika, 2022)	DER = Total Debt / Total Equity	Ratio
Capital Intensity (X ₄)	The number of long-term investments or permanent assets that a company uses to carry out its operations is referred to as capital intensity (Sardju, 2022)	Capital Intensity = Total Fixed Assets / Total Assets	Ratio
CSR Disclosure (Z ₁)	The process of educating the public about a business's social obligations and contributions to society is known as CSR disclosure (Afrizal & Dewi, 2020)	CSRD = Company CSR Items / Total GRI 2021 Indicator Items	Ratio



Variable	Definition	Indicator	Scale
Profitability (Z_2)	Profitability is a gauge of a business's capacity to turn a profit (Erlina, 2021)	ROA = Profit Before Tax / Total Assets	Ratio

Source: Processed data (2025)

3.5 Data Analysis Techniques

Data analysis in this study was conducted using panel data regression with the assistance of E-Views 12 statistical software. According to Ghozali (2021), panel data regression is used to examine the effect of multiple independent variables on a dependent variable using data that combines cross-sectional and time-series dimensions. The analysis stages included descriptive statistics, panel data regression estimation (Chow test, Hausman test, and Lagrange Multiplier test), classical assumption tests (multicollinearity and heteroscedasticity), coefficient of determination analysis, simultaneous F-test, partial t-test, Moderated Regression Analysis (MRA), and Sobel test for mediation. Descriptive statistics were employed to describe the characteristics of the research data, including mean, median, maximum, minimum, and standard deviation.

The panel data regression estimation was conducted to determine the most appropriate model among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The Chow test was used to compare CEM and FEM, the Hausman test was used to compare FEM and REM, and the Lagrange Multiplier test was used to compare CEM and REM. The classical assumption tests included multicollinearity and heteroscedasticity tests. The multicollinearity test was assessed using correlation coefficients, with values less than 0.80 indicating no multicollinearity. The heteroscedasticity test was conducted using the Chi-Square probability value, with a significance value greater than 0.05 indicating no heteroscedasticity.

Moderated Regression Analysis (MRA) was conducted to examine the moderating role of CSRD in the relationships between institutional ownership, independent commissioners, leverage, and capital intensity on tax management. The regression model used in this study was formulated as:

$$ETR = \alpha + \beta_1 KE PINS + \beta_2 KO MID + \beta_3 LEV + \beta_4 CA PIN + \beta_5 KE PINS_CSRD + \beta_6 KO MID_CSRD + \beta_7 LEV_CSRD + \beta_8 CA PIN_CSRD + \varepsilon$$

Where:

ETR = Tax Management

α = Constant

β_1 – β_8 = Regression coefficients

KE PINS = Institutional Ownership

KO MID = Independent Board of Commissioners

LEV = Leverage

CA PIN = Capital Intensity

KE PINS_CSRD = Interaction between Institutional Ownership and CSRD

KO MID_CSRD = Interaction between Independent Board of Commissioners and CSRD

LEV_CSRD = Interaction between Leverage and CSRD

CA PIN_CSRD = Interaction between Capital Intensity and CSRD

ε = Error term

The Sobel test was conducted to examine the mediating role of profitability (ROA) in the relationships between institutional ownership, independent commissioners, leverage, and capital intensity on tax management. The Sobel test formula used in this study was:



$$t = ab / \sqrt{(b^2SEa^2 + a^2SEb^2)}$$

Where:

- a = The path connecting the independent and intervening variables
- b = The path connecting the intervening and dependent variables
- SE = Standard Error

Hypothesis testing was conducted using several methods. The partial t-test was used to determine the individual effect of each independent variable on tax management. The simultaneous F-test was used to examine the collective effect of independent variables on tax management. The coefficient of determination (R^2) was used to determine the model's ability to explain variations in tax management. All hypothesis tests were conducted at a significance level of 5% ($p < 0.05$).

4. Results and Discussion

4.1 Descriptive Statistics

Table 4. Descriptive Statistics of Research Variables

Variable	N	Mean	Median	Maximum	Minimum	Std. Dev.
ETR	60	0.270559	0.223880	0.838790	0.007937	0.182027
KEPINS	60	0.749365	0.842604	1.000000	0.188865	0.235385
KOMID	60	0.472579	0.500000	0.833333	0.200000	0.157623
LEV	60	1.099220	0.854661	5.533852	0.111499	0.975782
CAPIN	60	0.232584	0.184598	0.717626	0.004336	0.216158
CSR	60	0.735470	0.760684	1.000000	0.188034	0.217050
PROFIT	60	0.112689	0.083848	0.454267	0.000663	0.095975

Source: Processed data from EViews 12 (2025)

Table 4 presents the descriptive statistics for all research variables based on 60 observations from 15 companies across four years (2021–2024). The Tax Management variable, measured by the effective tax rate (ETR), shows minimum and maximum values of 0.007937 and 0.838790, with a mean of 0.270559 and a standard deviation of 0.182027. This indicates that the average company paid an effective tax rate of approximately 27.06 percent, which is above the statutory tax rate of 22 percent, suggesting that some companies were paying more tax than required. The Institutional Ownership variable ranges from 0.188865 to 1.000000, averaging 0.749365, with a standard deviation of 0.235385, indicating that institutional investors held an average of 74.94 percent of shares, reflecting concentrated ownership. The Independent Commissioner variable has values between 0.200000 and 0.833333, with a mean of 0.472579 and a standard deviation of 0.157623, indicating that independent commissioners comprised approximately 47.26 percent of board members on average. The Leverage variable exhibits substantial variation, from 0.111499 to 5.533852, with a mean of 1.099220 and a standard deviation of 0.975782, indicating that the average company used debt exceeding its equity. The Capital Intensity variable ranges from 0.004336 to 0.717626, with an average of 0.232584 and a standard deviation of 0.216158, indicating that fixed assets comprised approximately 23.26 percent of total assets on average. The CSR variable ranges between 0.188034 and 1.000000, with a mean of 0.735470 and a standard deviation of 0.217050, indicating that companies disclosed approximately 73.55 percent of GRI indicators on average. The Profitability variable varies from 0.000663 to 0.454267, averaging 0.112689 with a standard deviation of 0.095975, indicating that the average company generated a return on assets of approximately 11.27 percent.



4.2 Panel Data Regression Estimation

Table 5. Panel Data Regression Conclusion

Test	P-Value	Significance Value	Description	Result
Chow	0.1208	0.05	$0.1208 > 0.05$	CEM
Hausman	0.4976	0.05	$0.4976 > 0.05$	REM
Lagrange Multiplier	0.8308	0.05	$0.8308 > 0.05$	CEM

Source: Processed data from EViews 12 (2025)

Table 5 presents the panel data regression estimation results. The probability of 0.1208 in the Chow test results is higher than the significance level of 0.05, suggesting that the Common Effect Model (CEM) is more appropriate than the Fixed Effect Model (FEM). With a probability of 0.4976, which is also above 0.05, the Hausman test shows that the Random Effect Model (REM) performs better than the Fixed Effect Model (FEM). The Lagrange Multiplier test, which produced a probability of 0.8308 above 0.05, indicates that the Random Effect Model (REM) is not better than the Common Effect Model (CEM). Based on these three tests, the study determines that the Common Effect Model (CEM) is the most suitable for further analysis.

4.3 Classical Assumption Tests

Table 6. Classical Assumption Tests Conclusion

Test	P-Value	Significance Value	Conclusion
Multicollinearity	Correlation Coefficient Value < 0.80	< 0.80	No Multicollinearity
Heteroscedasticity	Chi-Square Probability Value = 0.3486	> 0.05	No Heteroscedasticity

Source: Processed data from EViews 12 (2025)

Table 6 shows the classical assumption test results. Because the correlation values between independent variables are less than 0.80, the multicollinearity test concludes that there is no multicollinearity. This means that the regression model can use all independent variables simultaneously without affecting or distorting the estimation results. The heteroscedasticity test's Chi-Square probability value of 0.3486 is higher than the significance level of 0.05, indicating that there is no heteroscedasticity in the regression model. The distribution of the residuals is therefore consistent, and the output of the model is consistent and dependable.

4.4 Coefficient of Determination Testing (R^2)

Table 7. R^2 Test Result

R-squared	0.422687
Adjusted R-squared	0.332128

Source: Processed data from EViews 12 (2025)

Table 7 shows the coefficient of determination results. The adjusted R-squared value of 0.332128 indicates that 33.2128 percent of the variation in tax management (ETR) can be explained by capital intensity, leverage, independent board of commissioners, institutional ownership, and CSR disclosure as a moderator. The remaining 66.7872 percent is attributed to factors outside the model.



4.5 Simultaneous Test (F-Test)

Table 8. F-Test Result

F-statistic	4.667538
Prob(F-statistic)	0.000252

Source: Processed data from EViews 12 (2025)

Table 8 shows the simultaneous test results. The F-test findings indicate an F-statistic of 4.667538, which is higher than the F-table critical value of 2.54, and a probability of 0.000252, which is below 0.05. This illustrates that tax management (ETR) is simultaneously influenced by institutional ownership, capital intensity, leverage, and the independent board of commissioners, with corporate social responsibility disclosure serving as a moderator.

4.6 Partial Moderating Hypothesis Test Results (t-Test)

Table 9. Moderated Partial Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.553651	0.121754	4.547289	0.0000
KEPINS	-1.230384	0.323622	-3.801917	0.0004
KOMID	1.294415	0.508141	2.547355	0.0139
LEV	-0.042285	0.092020	-0.459524	0.6478
CAPIN	0.236568	0.289470	0.817246	0.4176
KEPINS_CSRD	1.136822	0.377049	3.015056	0.0040
KOMID_CSRD	-1.644129	0.655553	-2.508001	0.0154
LEV_CSRD	0.084478	0.122233	0.691126	0.4926
CAPIN_CSRD	-0.699046	0.453518	-1.541386	0.1294

Source: Processed data from EViews 12 (2025)

Table 9 presents the moderated partial test results, which reveal clearer patterns in the relationships between moderating and primary variables. The t-test confirms H1, showing that institutional ownership (KEPINS) has a p-value of $0.0004 < 0.05$ and a t-statistic of -3.801917 , which exceeds the critical t-value of 2.00. This indicates that institutional ownership negatively impacts tax management (ETR). The results align with Dewanti and Biduri (2024) and Nahat and Yoshida (2025), suggesting that institutional investors have less effective monitoring, which permits management to make opportunistic tax decisions. According to Agency Theory, this circumstance shows that the principal has little control over the agent. H2 is confirmed by the t-test, with the independent board of commissioners (KOMID) showing a significant p-value of $0.0139 < 0.05$ and a t-statistic of $2.547355 > 2.00$, demonstrating a positive influence on tax management (ETR). The findings match those of Dewanti and Biduri (2024) and Masrurroch et al. (2021). According to Agency Theory, this implies that independent commissioners can keep a closer eye on management, which makes tax decisions more effective and in line with the owners' interests. Based on the t-test, H3 is rejected because leverage (LEV) shows a non-significant p-value of $0.6478 > 0.05$ and a t-statistic of -0.459524 that does not meet the t-table threshold of 2.00. This aligns with Verensia and Febrianti (2022) and Tambunan and Malau (2021), implying that debt does not affect tax decisions because it is an ineffective control tool for creditors. The results show that H4 is not accepted, with capital intensity (CAPIN) obtaining a p-value of $0.4176 > 0.05$ and a t-statistic of 0.817246 , demonstrating an insignificant effect. This concurs with Adrian et al. (2025) and Ghozali (2021), implying that a company's tax decisions are independent of the size of its fixed assets.



The results of the t-test confirm a positive moderating role of CSR disclosure in the institutional ownership–tax management (ETR) relationship, with a significant p-value of 0.0040 and a t-statistic of $3.015056 > t\text{-table } 2.00$. Thus, H5 is accepted. This supports Dewanti and Biduri (2024), who found that CSR disclosure enhances transparency, reduces asymmetry, and curbs managerial opportunism, encouraging compliance and better tax performance under high institutional ownership. The t-test indicates that CSR disclosure negatively moderates the effect of independent commissioners on tax management (ETR), evidenced by a t-statistic of $-2.508001 > 2.00$ and a p-value of $0.0154 < 0.05$. Therefore, H6 is accepted. This aligns with Dewanti and Biduri (2024), as greater transparency and accountability deter aggressive tax behaviors, improving oversight and reducing opportunistic actions from an Agency Theory perspective. The t-test indicates that CSR disclosure does not moderate the effect of leverage on tax management (ETR), as shown by a t-statistic of $0.691126 < 2.00$ and a p-value of $0.4926 > 0.05$. Thus, H7 is rejected. This matches Parwati and Isthika (2024) and Handoko Putro et al. (2022), indicating that CSR disclosure alone cannot mitigate debt-related managerial conflicts, leaving leverage's effect on ETR unchanged. The t-test confirms that CSR disclosure has no moderating influence on the effect of capital intensity on tax management (ETR), given the insignificant p-value of 0.1294 and the t-statistic of -1.541386 . Therefore, H8 is rejected. This agrees with Syakirah et al. (2025), suggesting that CSR disclosure fails to prevent managers from using fixed assets for tax purposes, with Agency Theory highlighting persistent conflicts in asset management.

4.7 Sobel Test (Mediation Test)

4.7.1 Structural 1 – Dependent Variable: Profitability (ROA)

Table 10. Partial Hypothesis Test Results Structural 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.041232	0.084176	0.489826	0.6262
KEPINS	0.144447	0.073897	1.954716	0.0557
KOMID	-0.025559	0.090654	-0.281944	0.7790
LEV	-0.007728	0.014058	-0.549762	0.5847
CAPIN	-0.069725	0.007716	-0.903600	0.3701

Source: Processed data from EViews 12 (2025)

Table 10 presents the partial hypothesis test results for Structural 1 with profitability (ROA) as the dependent variable. The institutional ownership (KEPINS) variable has a t-statistic of $1.954716 < 2.00$ and a probability of $0.0557 > 0.05$, indicating that institutional ownership does not influence profitability (ROA). For the independent board of commissioners (KOMID), the t-statistic is $-0.281944 < 2.00$ with a probability of $0.7790 > 0.05$, showing that this variable has no effect on profitability (ROA). The leverage (LEV) variable records a t-statistic of $-0.549762 < 2.00$ and a probability of $0.5847 > 0.05$, meaning leverage does not significantly determine profitability (ROA). Capital intensity (CAPIN) produces a t-statistic of $-0.903600 < 2.00$ and a probability of $0.3701 > 0.05$, implying that capital intensity does not significantly contribute to changes in profitability (ROA).

4.7.2 Structural 2 – Dependent Variable: Tax Management (ETR)

Table 11. Partial Hypothesis Test Results Structural 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.568540	0.118974	4.778685	0.0000



Variable	Coefficient	Std. Error	t-Statistic	Prob.
KEPINS	-0.244185	0.100283	-2.434951	0.0182
KOMID	-0.009104	0.124961	-0.072855	0.9422
LEV	0.015523	0.025583	0.606771	0.5465
CAPIN	-0.274550	0.104370	-2.630538	0.0111
PROFIT	-0.566908	0.234753	-2.414912	0.0192

Source: Processed data from EViews 12 (2025)

Table 11 presents the partial hypothesis test results for Structural 2 with tax management (ETR) as the dependent variable. With a p-value of $0.0182 < 0.05$, a t-table value of 2.00, and a t-statistic of -2.434951 , institutional ownership (KEPINS) is shown to have a significant negative effect on tax management (ETR). The independent board of commissioners (KOMID) produces a p-value of $0.9422 > 0.05$ and a t-statistic of -0.072855 , far below the t-table value, confirming that it has no significant effect on tax management (ETR). Leverage (LEV) is found to have no significant impact on tax management (ETR), as indicated by a p-value of $0.5465 > 0.05$ and a t-statistic of $0.606771 < \text{t-table } 2.00$. Capital intensity (CAPIN) significantly and negatively affects tax management (ETR), supported by a p-value of $0.0111 < 0.05$, a t-statistic of -2.630538 , and a t-table benchmark of 2.00. Profitability (ROA) demonstrates a significant negative effect on tax management (ETR), with a p-value of $0.0192 < 0.05$ and a t-statistic of $-2.414912 < \text{t-table } 2.00$.

4.7.3 Sobel Test Results

Table 12. Conclusion of Sobel Test Results

Independent Variable	T-Value	T-Table	Description	Test Results
KEPINS	1.51	2.00	T-value (1.51) < T-Table (2.00)	Not Mediating
KOMID	0.28	2.00	T-value (0.28) < T-Table (2.00)	Not Mediating
LEV	0.53	2.00	T-value (0.53) < T-Table (2.00)	Not Mediating
CAPIN	2.33	2.00	T-value (2.33) > T-Table (2.00)	Mediating

Source: Processed data from EViews 12 (2025)

Table 12 presents the Sobel test results, which were used to check how the independent variables affect tax management (ETR) through profitability (ROA) as the mediating variable. The impact of institutional ownership on ETR with ROA acting as a mediator is insignificant, with a t-statistic of 1.51 below the 2.00 threshold and a p-value of $0.1286 > 0.05$. Therefore, H9 is rejected, indicating that ROA does not act as a mediator between institutional ownership and tax management. This result is consistent with the findings of Tjahjono et al. (2022) and Alya and Husnaini (2024), which contend that institutional ownership has no effect on tax management through profitability. Rather than leveraging profits to lower taxes, institutional investors are more concerned with monitoring and adherence to regulations. The impact of an independent board of commissioners on ETR with ROA serving as a mediating factor shows a Sobel test t-statistic of 0.28, which is below the t-table value of 2.00 and a p-value of $0.7794 > 0.05$. This indicates that H10 is rejected and ROA does not serve as a mediator between independent commissioners and tax management (ETR). This result is in line with what Sunarto et al. (2021) found.



Agency Theory states that independent commissioners primarily serve as watchdogs to stop managers from acting selfishly. Regardless of the company's profitability, their oversight role has a direct impact on tax management because they continue to perform their duties regardless of the level of profit.

The impact of leverage on tax management (ETR) with ROA as a mediating factor is not supported, as the t-statistic of 0.53 is lower than the required t-value of 2.00 and the p-value of 0.5919 exceeds 0.05. Thus, H11 is rejected, meaning ROA fails to mediate the effect of leverage on tax management (ETR). The results of this study are in line with previous research by Ma'roep (2024) and Nathania et al. (2021), which discovered that although high-debt companies can use loan funds to support operational activities, doing so does not always increase profitability. High leverage also results in high interest payments, which actually increase costs and reduce firm profitability. The impact of capital intensity on tax management (ETR) using ROA as a mediating factor shows a Sobel test t-statistic of 2.33, which is higher than the table's t-value of 2.00 and p-value of $0.0196 < 0.05$. Thus, H12 is accepted since ROA contributes to the explanation of how capital intensity influences tax management (ETR). This result is in line with what Mas'adah et al. (2024) found. Larger assets therefore boost performance (ROA), which in turn influences corporate tax choices. According to Agency Theory, better performance boosts management's supervision and promotes more effective tax choices.

4.8 Discussion

4.8.1 The Effect of Institutional Ownership on Tax Management

The results show that institutional ownership has a significant negative effect on tax management (ETR) ($B = -1.230$; $p = 0.000$), indicating that higher institutional ownership is associated with lower effective tax rates, which suggests more aggressive tax management. This finding contradicts the prediction of Agency Theory, which assumes that institutional investors should strengthen oversight and encourage compliance with tax regulations, thereby increasing the ETR. The negative relationship suggests that institutional investors in the Indonesian energy sector may have less effective monitoring, which permits management to make opportunistic tax decisions. According to Agency Theory, this circumstance shows that the principal has little control over the agent (Jensen & Meckling, 1976). This result is consistent with previous studies by Dewanti and Biduri (2024) and Nahat and Yoshida (2025), which also concluded that institutional ownership negatively impacts tax management. The finding implies that institutional investors in this sector may prioritize financial returns over tax compliance, or that their oversight mechanisms are not sufficiently robust to prevent aggressive tax practices.

4.8.2 The Effect of Independent Board of Commissioners on Tax Management

The results show that the independent board of commissioners has a significant positive effect on tax management (ETR) ($B = 1.294$; $p = 0.014$), indicating that a higher proportion of independent commissioners is associated with higher effective tax rates, which suggests more compliant tax management. This finding supports Agency Theory, which posits that independent commissioners serve as monitoring mechanisms that reduce information asymmetry between management and shareholders (Jensen & Meckling, 1976). According to Agency Theory, independent commissioners can keep a closer eye on management, which makes tax decisions more effective and in line with the owners' interests. The findings match those of Dewanti and Biduri (2024) and Masrurroch



et al. (2021), which also concluded that independent commissioners positively influence tax management. The finding implies that independent commissioners in the Indonesian energy sector play an effective oversight role, ensuring that management complies with tax regulations and avoids aggressive tax practices.

4.8.3 The Effect of Leverage on Tax Management

The results show that leverage has no significant effect on tax management (ETR) ($B = -0.042$; $p = 0.648$), indicating that debt levels do not influence tax management practices in the Indonesian energy sector during the observation period. This finding aligns with Verensia and Febrianti (2022) and Tambunan and Malau (2021), which also concluded that leverage does not significantly affect tax management. The finding implies that debt does not affect tax decisions because it is an ineffective control tool for creditors in this sector. According to Agency Theory, this implies that management action is not sufficiently restrained by supervisory pressure from creditors (Jensen & Meckling, 1976). The finding suggests that in the energy sector, where debt financing is a routine feature of operations, leverage may be perceived as an ordinary operating choice rather than a distinct tax management tool, reducing its informational value for tax authorities and investors.

4.8.4 The Effect of Capital Intensity on Tax Management

The results show that capital intensity has no significant effect on tax management (ETR) ($B = 0.237$; $p = 0.418$), indicating that the proportion of fixed assets does not influence tax management practices in the Indonesian energy sector during the observation period. This finding concurs with Adrian et al. (2025) and Ghozali (2021), which also concluded that capital intensity has no significant effect on tax management. The finding implies that a company's tax decisions are independent of the size of its fixed assets. According to Agency Theory, assets are not a means by which management can take advantageous or tax-efficient actions (Jensen & Meckling, 1976). The finding suggests that in the energy sector, where fixed assets are essential for operations, capital intensity may be perceived as a routine operational feature rather than a tax management tool, reducing its relevance for tax planning.

4.8.5 The Moderating Role of CSRD in the Relationship Between Institutional Ownership and Tax Management

The results show that CSRD positively moderates the relationship between institutional ownership and tax management (ETR) ($B = 1.137$; $p = 0.004$), indicating that the negative effect of institutional ownership on ETR is strengthened in the presence of higher CSRD. This finding supports Dewanti and Biduri (2024), who found that CSR disclosure enhances transparency, reduces asymmetry, and curbs managerial opportunism, encouraging compliance and better tax performance under high institutional ownership. From the perspective of Agency Theory, CSRD functions as a monitoring mechanism that reduces information asymmetry between management and stakeholders (Jensen & Meckling, 1976). Enhanced disclosure and monitoring through robust CSRD encourage executives to adopt more prudent tax strategies. The finding implies that CSRD can serve as a complementary governance mechanism that enhances the effectiveness of institutional oversight in shaping tax practices.



4.8.6 The Moderating Role of CSRD in the Relationship Between Independent Board of Commissioners and Tax Management

The results show that CSRD negatively moderates the relationship between independent commissioners and tax management (ETR) ($B = -1.644$; $p = 0.015$), indicating that the positive effect of independent commissioners on ETR is weakened in the presence of higher CSRD. This finding aligns with Dewanti and Biduri (2024), as greater transparency and accountability deter aggressive tax behaviors, improving oversight and reducing opportunistic actions from an Agency Theory perspective. According to Agency Theory, CSRD boosts clarity, enabling independent overseers to better assess managerial actions and reinforce control (Jensen & Meckling, 1976). This prompts executives to exercise greater caution in tax approaches, amplifying the role of independent commissioners in determining the ETR. The finding implies that CSRD and independent commissioners may serve as substitutive governance mechanisms, where the presence of one reduces the marginal effectiveness of the other in shaping tax practices.

4.8.7 The Moderating Role of CSRD in the Relationship Between Leverage and Tax Management

The results show that CSRD does not moderate the relationship between leverage and tax management (ETR) ($B = 0.084$; $p = 0.493$). This finding matches Parwati and Isthika (2024) and Handoko Putro et al. (2022), indicating that CSR disclosure alone cannot mitigate debt-related managerial conflicts, leaving leverage's effect on ETR unchanged. From the perspective of Agency Theory, this suggests that CSRD may not be sufficient to counteract the tax-related incentives associated with debt financing (Jensen & Meckling, 1976). The finding implies that in the energy sector, where debt financing is a routine feature of operations, CSRD may not be effective in moderating the relationship between leverage and tax management, possibly because the tax benefits of debt are already well-established and transparent.

4.8.8 The Moderating Role of CSRD in the Relationship Between Capital Intensity and Tax Management

The results show that CSRD does not moderate the relationship between capital intensity and tax management (ETR) ($B = -0.699$; $p = 0.129$). This finding agrees with Syakirah et al. (2025), suggesting that CSR disclosure fails to prevent managers from using fixed assets for tax purposes, with Agency Theory highlighting persistent conflicts in asset management. From the perspective of Agency Theory, this suggests that CSRD may not be sufficient to counteract the tax-related incentives associated with fixed asset investment (Jensen & Meckling, 1976). The finding implies that in the energy sector, where fixed assets are essential for operations, CSRD may not be effective in moderating the relationship between capital intensity and tax management, possibly because the tax benefits of depreciation are already well-established and transparent.

4.8.9 The Mediating Role of Profitability in the Relationship Between Institutional Ownership and Tax Management

The results show that profitability does not mediate the relationship between institutional ownership and tax management (ETR) ($t = 1.51$; $p = 0.129$). This result is consistent with the findings of Tjahjono et al. (2022) and Alya and Husnaini (2024), which contend that institutional ownership has no effect on tax management through profitability. Rather than leveraging profits to lower taxes, institutional investors are more



concerned with monitoring and adherence to regulations. From the perspective of Agency Theory, this suggests that institutional ownership influences tax management through direct oversight mechanisms rather than through profitability (Jensen & Meckling, 1976). The finding implies that in the energy sector, institutional investors may prioritize direct monitoring over indirect influence through financial performance.

4.8.10 The Mediating Role of Profitability in the Relationship Between Independent Board of Commissioners and Tax Management

The results show that profitability does not mediate the relationship between independent commissioners and tax management (ETR) ($t = 0.28$; $p = 0.779$). This result is in line with what Sunarto et al. (2021) found. Agency Theory states that independent commissioners primarily serve as watchdogs to stop managers from acting selfishly (Jensen & Meckling, 1976). Regardless of the company's profitability, their oversight role has a direct impact on tax management because they continue to perform their duties regardless of the level of profit. The finding implies that in the energy sector, independent commissioners influence tax management through direct oversight rather than through profitability, highlighting the importance of governance mechanisms in shaping tax practices.

4.8.11 The Mediating Role of Profitability in the Relationship Between Leverage and Tax Management

The results show that profitability does not mediate the relationship between leverage and tax management (ETR) ($t = 0.53$; $p = 0.592$). The results of this study are in line with previous research by Ma'roep (2024) and Nathania et al. (2021), which discovered that although high-debt companies can use loan funds to support operational activities, doing so does not always increase profitability. High leverage also results in high interest payments, which actually increase costs and reduce firm profitability. From the perspective of Agency Theory, this suggests that leverage influences tax management through direct tax shield effects rather than through profitability (Jensen & Meckling, 1976). The finding implies that in the energy sector, the tax benefits of debt are realized directly through interest deductions rather than indirectly through improved profitability.

4.8.12 The Mediating Role of Profitability in the Relationship Between Capital Intensity and Tax Management

The results show that profitability mediates the relationship between capital intensity and tax management (ETR) ($t = 2.33$; $p = 0.020$). This result is in line with what Mas'adah et al. (2024) found. Larger assets therefore boost performance (ROA), which in turn influences corporate tax choices. According to Agency Theory, better performance boosts management's supervision and promotes more effective tax choices (Jensen & Meckling, 1976). The finding implies that in the energy sector, capital intensity influences tax management through profitability, highlighting the importance of asset utilization in shaping financial performance and tax practices. This finding suggests that effective asset management can enhance profitability, which in turn influences corporate tax decisions, providing a channel through which capital intensity affects tax management.

5. Conclusion

This study aimed to examine the effect of capital intensity, leverage, institutional ownership, and independent commissioners on tax management in energy sector



companies listed on the Indonesia Stock Exchange during the 2021–2024 period, with CSRD as a moderating variable and profitability as a mediating variable. Using a quantitative approach with panel data regression, Moderated Regression Analysis, and Sobel's test for mediation on 60 observations from 15 companies selected through purposive sampling, the study successfully tested the proposed hypotheses.

The results indicate that institutional ownership has a significant negative effect on tax management (ETR), with a regression coefficient of -1.230 and a significance value of 0.000 , indicating that H1 is not supported in the expected direction. Higher institutional ownership is associated with lower effective tax rates, suggesting more aggressive tax management. Independent commissioners have a significant positive effect on tax management (ETR), with a regression coefficient of 1.294 and a significance value of 0.014 , indicating that H2 is supported. A higher proportion of independent commissioners is associated with higher effective tax rates, suggesting more compliant tax management. Leverage has no significant effect on tax management (ETR), with a regression coefficient of -0.042 and a significance value of 0.648 , indicating that H3 is not supported. Capital intensity has no significant effect on tax management (ETR), with a regression coefficient of 0.237 and a significance value of 0.418 , indicating that H4 is not supported.

CSRD positively moderates the relationship between institutional ownership and tax management (ETR), with a coefficient of 1.137 and a significance value of 0.004 , indicating that H5 is supported. CSRD negatively moderates the relationship between independent commissioners and tax management (ETR), with a coefficient of -1.644 and a significance value of 0.015 , indicating that H6 is supported. CSRD does not moderate the relationship between leverage and tax management (ETR), with a coefficient of 0.084 and a significance value of 0.493 , indicating that H7 is not supported. CSRD does not moderate the relationship between capital intensity and tax management (ETR), with a coefficient of -0.699 and a significance value of 0.129 , indicating that H8 is not supported.

Profitability does not mediate the relationship between institutional ownership and tax management (ETR), with a Sobel t -statistic of 1.51 , indicating that H9 is not supported. Profitability does not mediate the relationship between independent commissioners and tax management (ETR), with a Sobel t -statistic of 0.28 , indicating that H10 is not supported. Profitability does not mediate the relationship between leverage and tax management (ETR), with a Sobel t -statistic of 0.53 , indicating that H11 is not supported. Profitability mediates the relationship between capital intensity and tax management (ETR), with a Sobel t -statistic of 2.33 , indicating that H12 is supported. The adjusted coefficient of determination indicated that 33.21 percent of the variation in tax management was explained by the model, while the remaining 66.79 percent was attributed to factors outside the model.

The theoretical implications of this study extend the application of Agency Theory to the context of tax management in Indonesia. The finding that institutional ownership negatively influences tax management suggests that institutional investors in the Indonesian energy sector may have less effective monitoring, permitting management to make opportunistic tax decisions. The finding that independent commissioners positively influence tax management supports Agency Theory's emphasis on the role of independent commissioners as monitoring mechanisms that reduce information asymmetry between management and shareholders. The finding that CSRD moderates the relationships between institutional ownership, independent commissioners, and tax management



supports the argument that CSRD functions as a complementary governance mechanism that enhances transparency and accountability. The finding that profitability mediates only the relationship between capital intensity and tax management suggests that asset utilization influences tax management through financial performance, providing a channel through which capital intensity affects tax practices. This study also contributes to the limited empirical evidence on the determinants of tax management in the energy sector, providing insights into how governance mechanisms, financial ratios, CSR disclosure, and profitability collectively influence tax management.

Based on these findings, several recommendations can be proposed. For investors, the findings suggest that institutional ownership and independent commissioners should be considered as important indicators when evaluating a company's tax management practices. For policymakers and tax authorities, the results suggest that strengthening governance mechanisms and promoting transparent CSR disclosure can enhance tax compliance and reduce aggressive tax practices. For company management, the results suggest that maintaining a balanced composition of independent commissioners and transparent CSR disclosure can improve tax management and reduce tax risk. For academics, this study contributes to the growing body of literature on taxation and corporate governance, providing a foundation for future research on tax management.

This study has several limitations that should be acknowledged. First, the study focuses only on energy sector companies listed on the Indonesia Stock Exchange, which may limit the generalizability of the findings to other sectors or industries. Second, the study uses a four-year observation period (2021–2024), which may not capture long-term changes in tax practices. Third, the sample size is relatively small (15 companies, 60 observations) due to strict sampling criteria, which may limit the statistical power of the analysis. Fourth, the study examines only a limited set of governance and financial variables, without considering other potential determinants of tax management such as audit quality, ownership structure, or macroeconomic factors. Fifth, the model's explanatory power is moderate, with an adjusted R-squared value of 0.332, indicating that other factors not included in the model may still influence tax management.

For future research, it is recommended to expand the scope of study by involving other sectors or industries to improve the generalizability of the findings. Future studies may also extend the observation period to capture long-term changes in tax practices and increase the sample size to enhance statistical power. Additionally, future research may incorporate additional variables, such as audit quality, ownership structure, and macroeconomic factors, to provide a more comprehensive understanding of the determinants of tax management. Researchers should also consider employing qualitative or mixed-method approaches to gain deeper insights into the challenges and effectiveness of tax management practices in the energy sector.

In conclusion, this study contributes to the growing body of literature on taxation and corporate governance by providing empirical evidence on the determinants of tax management in energy sector companies in Indonesia. The findings suggest that institutional ownership, independent commissioners, CSRD, and profitability significantly influence tax management, while leverage and capital intensity do not. As Indonesia continues to strengthen its tax system and corporate governance practices, understanding these factors becomes increasingly important for developing effective strategies to enhance tax compliance and protect state revenue.



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