

The Effect of Tax Planning on Business Profitability with Tax Efficiency as a Moderating Variable (Study of Coal Energy Companies in the 2022 - 2024 Period)

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Abstract

This study aims to examine the effect of tax planning on firm profitability and to analyze the moderating role of tax efficiency in the relationship between tax planning and profitability in coal energy sector companies. This sector is characterized by relatively high profits, resulting in substantial income tax obligations, which encourage companies to implement tax planning strategies and improve tax efficiency to maintain financial performance. This research employs a quantitative approach using panel data from three coal companies listed on the Indonesia Stock Exchange, namely PT Adaro Energy Indonesia Tbk, PT Bukit Asam Tbk, and PT Indo Tambangraya Megah Tbk, covering the period of 2022 - 2024. Data analysis is conducted using Moderated Regression Analysis (MRA) after passing classical assumption tests. The findings indicate that tax planning has no significant effect on profitability, and tax efficiency also does not significantly influence profitability. Furthermore, tax efficiency is not proven to moderate the relationship between tax planning and profitability. This study contributes to the literature by providing empirical evidence on the moderating role of tax efficiency in the coal energy sector, which remains underexplored in the Indonesian context.

INTRODUCTION

The coal-based energy sector continues to play a significant role in Indonesia's economic structure through its contribution to state revenue, exports, and meeting domestic energy needs. For more than a decade, coal has been a leading commodity, supporting the country's trade balance and fiscal revenue. Research by Octaviani et al. (2025) shows that Indonesia consistently ranks among the world's largest coal producers and exporters, with primary markets including Asian countries such as China, India, Japan, and South Korea. This large-scale coal production and sales activity drives companies in this sector to generate relatively high revenues and profits compared to many other industrial sectors listed on the Indonesia Stock Exchange.

The high profits generated by coal companies directly impact the amount of tax liabilities they must pay. Corporate income tax is a significant cost component in a company's financial statements (Ningsih & Gazali, 2022). Under the Indonesian tax system, which implements the self-assessment principle, companies have the authority to calculate, pay, and report their tax obligations in accordance with applicable laws and regulations. This situation places company management in a strategic position in determining tax management policies as part of the company's overall financial decisions. A large tax burden has the potential to reduce net profits available to shareholders and limit the company's ability to expand and invest further (Anti et al., 2025).

This situation encourages coal companies to engage in tax planning as part of their financial management strategy. Tax planning is understood as a company's efforts to regulate financial transactions and policies with the aim of legally minimizing the tax burden without violating tax laws (Fadilla et al., 2024). This practice is carried out through various means, such as selecting accounting policies, determining the timing of revenue and expense recognition, and utilizing tax facilities and incentives provided by the government. An effective tax rate lower than the nominal tax rate is often interpreted as an indication of an effective tax planning strategy. In a study by Amai et al. (2025), the effective tax rate is often used as an indicator to measure the level of a company's tax planning because this ratio reflects the proportion of tax burden to overall pre-tax profit and can indicate the effectiveness of a company's tax strategy.

The profitability of coal companies differs from other industrial sectors because it is heavily influenced by global commodity price fluctuations (Nurron & Nur, 2022). Global coal prices are volatile and influenced by various external factors, such as global energy demand, energy policies of major consuming countries, geopolitical conditions, and the dynamics of the energy transition. These price fluctuations directly impact coal companies' revenues and profits, allowing profitability levels to fluctuate significantly from one period to the next (Lahallo & Tindage, 2025). This situation makes cost management a crucial factor for company management, including mandatory and unavoidable taxes.

Return on Assets (ROA) is widely used in financial research as an indicator for assessing company profitability, as this ratio illustrates the extent to which a company is able to generate profits from all its assets (auliyah & saleh, 2024). In the capital-intensive coal sector, ROA provides an overview of the efficiency of asset utilization in generating profits. Fluctuations in ROA in coal companies are often influenced by changing market conditions and the effectiveness of the company's operational management. When coal prices rise, company profits tend to increase, but when coal prices decline, company profitability can come under pressure even if production volumes remain relatively stable.

The relationship between tax planning and business profitability has been widely studied in accounting and finance research, but the results have yielded mixed results. Research by Lestari & Agustiningsih (2023) states that tax planning influences corporate profitability because this strategy can reduce the tax burden, thereby increasing the company's net profit. Another study by Ryanto et al. (2025) showed different results, namely that tax planning does not have a significant impact on profitability, particularly in industrial sectors whose performance is highly dependent on external factors such as commodity price fluctuations and macroeconomic conditions. This variation in empirical findings indicates that the effect of tax planning on profitability is not uniform and is influenced by company characteristics and the conditions of the industry in which the company operates.

Differences in tax management practices between companies also influence the effectiveness of tax planning in increasing business profitability. Companies with different ownership and governance structures exhibit different approaches to managing tax obligations. State-owned companies are under stricter public scrutiny regarding tax policies, while private companies have greater flexibility in strategic decision-making (Vizandra & Mustikasari, 2021). These differences in characteristics have the potential to influence the relationship between tax planning and business profitability, thus research results may vary across companies and industry sectors.

Tax efficiency is a relevant aspect to study in the relationship between tax planning and business profitability. Tax efficiency not only indicates the amount of tax a company pays but also illustrates its ability to manage tax liabilities against its operating profit. The ratio of tax burden to operating profit is used to indicate the extent to which taxes affect a company's operating results (Maudy, 2024). In the coal industry, which experiences high profit fluctuations, tax efficiency has the potential to influence the strength of the relationship between tax planning and business profitability. Companies with better tax efficiency tend to be able to maintain stable financial performance when facing changing market conditions.

The selection of coal sector companies as research subjects was based on the industry's characteristics of high profits, significant tax liabilities, and fluctuating profitability levels. Companies like PT Adaro Energy Indonesia Tbk are known for their large business scale and high tax contributions, making them interesting to study in relation to tax planning practices. PT Bukit Asam Tbk, as a state-owned company, has different governance and tax compliance characteristics than private companies, providing a different perspective in tax management analysis. PT Indo Tambangraya Megah Tbk, with its significantly fluctuating profitability levels, makes it relevant to examine the role of tax efficiency in the dynamics of the company's financial performance.

However, empirical studies specifically examining tax efficiency as a moderating variable in the relationship between tax planning and business profitability in the coal energy sector are still relatively limited. Most previous studies have focused on the direct effect of tax planning on profitability or tax aggressiveness, neglecting the role of tax efficiency. They have focused on the manufacturing and service sectors and on examining the direct effect of tax policy on financial performance. This situation suggests that there is room for further research to provide a more comprehensive understanding of the dynamics of tax management and the financial performance of coal sector companies.

Given the characteristics of the coal sector, which generates large profits, significant tax liabilities, and fluctuating profitability levels, research on the effect of tax planning on business profitability, with tax efficiency as a moderating variable, is relevant. This research focuses on coal energy companies listed on the Indonesia Stock Exchange from 2022 to 2024, with the hope of providing an empirical overview of the relationship between tax management strategies and corporate financial performance in an industry that plays a strategic role in the national economy.

LITERATURE REVIEW

The Influence of Tax Planning on Business Profitability

Theoretically, the relationship between tax planning and business profitability can be explained through the perspective of financial management and corporate cost theory. Tax planning serves as a managerial strategy aimed at optimizing cost structures through legally managing tax obligations. When companies are able to reduce their tax burden without violating tax regulations, after-tax profits available to shareholders and for reinvestment can increase (Usboko, 2024). This situation positions tax planning as part of a strategy to improve a company's financial performance.

One effort that can be implemented is through effective tax management, as taxes are mandatory expenses that do not provide direct benefits to the company (Roslita & Safitri, 2022). Suboptimal tax management has the potential to create cost inefficiencies, which can impact profitability. However, the effectiveness of tax planning in increasing profitability is strongly influenced by industry characteristics, revenue stability, and the company's cost structure.

The relationship between tax planning and business profitability has been the focus of various empirical studies. Research Bala et al., (2025); Okolie & Chukuwendu, (2025) shows that tax planning is related to profitability because an effective tax strategy can reduce the tax burden and increase a company's net profit. Research by Siyanbola & Durosinmi (2025) found that companies implementing specific tax strategies have different levels of financial performance compared to companies that do not actively engage in tax planning. These findings suggest that tax planning can be a factor influencing corporate profitability.

Other studies have yielded inconsistent results. A study by Ibrahimov et al. (2025) found that tax planning had no significant effect on profitability, particularly in industrial sectors whose performance is more influenced by external factors such as commodity price fluctuations and macroeconomic conditions. These differing empirical results indicate that the relationship between tax planning and profitability is not universal and is heavily influenced by the characteristics of the industrial sector, cost structure, and company operating conditions.

This study shares similarities with previous research in using the effective tax rate as a proxy for tax planning and return on assets as a proxy for profitability. The differences lie in the sectors studied and the more recent observation period. While previous research has focused on the manufacturing and service sectors, this study focuses on the coal energy sector, which is characterized by high profits and high profitability volatility. This sectoral difference presents a research gap because the relationship between tax planning and profitability in commodity-based industries has not been studied in depth. The differences in proxies and empirical results in previous research indicate a relevant research gap requiring further investigation. Based on this description, the first hypothesis is formulated as follows:

H1: Tax planning has a significant effect on business profitability.

The Effect of Tax Efficiency on Business Profitability

Tax efficiency is theoretically related to a company's ability to manage the tax burden against profits generated from operational activities (Kalventri, 2022). Unlike tax planning, which focuses on strategies to reduce tax liabilities, tax efficiency emphasizes the balance between taxes paid and the company's operational performance.

Cost efficiency theory explains that companies with good cost management tend to have more stable profitability (Maudy, 2024). Taxes, as a component of indirect operational costs, can impact profits through their influence on cash flow and operational decisions. Companies that are able to maintain the proportion of tax burden to operating profit at a manageable level have greater room to maintain financial performance, especially when facing changing market conditions.

Tax efficiency has also been studied in relation to corporate profitability. Several studies have shown that companies with better tax efficiency tend to have more stable financial performance due to their ability to manage the tax burden against operating profit. Research by Pratama & Muhammad (2025) found that tax management efficiency is related to a company's financial performance through its influence on operating profit and net income.

However, other research by Iqbal et al. (2025); Sakinah et al. (2025) found that tax efficiency does not always have a significant effect on profitability. This difference in results is influenced by variations in industrial sectors, differences in company size, and differences in indicators used to measure tax efficiency. Research in specific sectors indicates that tax efficiency has a limited effect when external factors are more dominant in determining a company's financial performance.

This study shares similarities with previous research in positioning tax efficiency as an independent variable related to profitability. The differences lie in the use of the ratio of tax burden to operating profit as a proxy for tax efficiency and the focus on the coal sector, which has a different profit and cost structure than other sectors. This research gap arises from the limited research examining the effect of tax efficiency on business profitability in commodity-based industries with high levels of profit fluctuation. Based on this description, the second hypothesis is formulated as follows:

H2: Tax efficiency has a significant effect on business profitability.

Tax Efficiency as a Moderating Variable in the Effect of Tax Planning on Business Profitability

In moderation theory, a variable is considered a moderator if it can influence the strength and direction of the relationship between the independent and dependent variables. Tax efficiency can act as a moderating variable in the relationship between tax planning and profitability, because the level of efficiency in tax management has the potential to determine how effectively tax planning strategies can be translated into a company's financial performance (Prameswari & Setijaningsih, 2024). Aggressive tax planning does not always result in increased profitability if it is not accompanied by efficient tax management of operating profit.

From a strategic management perspective, tax planning can be viewed as a policy, while tax efficiency is viewed as the quality of policy implementation. Companies with a high level of tax efficiency have the potential to reap greater benefits from tax planning strategies because tax savings can be integrated with operational performance. Conversely, companies with low tax efficiency may experience a situation where tax planning has no significant impact on profitability due to the predominance of operational expenses and external factors (Levia & Wahyudi, 2025).

Studies of moderating variables in tax research indicate that the effect of tax planning on profitability can be influenced by other factors related to corporate tax management. Several studies have used specific tax variables as moderators to explain variations in the influence of tax planning on financial performance. Research by Suryanto (2024) shows that the characteristics of a company's tax policy can influence the relationship between tax strategy and financial performance.

This study shares similarities with previous research in using a moderated regression analysis approach to test the role of tax variables as moderators. The differences lie in the choice of tax efficiency as a moderating variable and the focus on the coal energy sector. Previous studies have primarily used corporate governance or tax aggressiveness as moderators, while this study uses tax efficiency, measured by the ratio of tax burden to operating profit. This research gap arises from the limited empirical studies that utilize tax efficiency as a moderating variable in the relationship between tax planning and business profitability, particularly in the commodity-based energy sector. Based on this description, the third hypothesis is formulated as follows:

H3: Tax efficiency significantly moderates the effect of tax planning on business profitability.

Based on the development of the hypothesis, Figure 1 is a research model that was created.

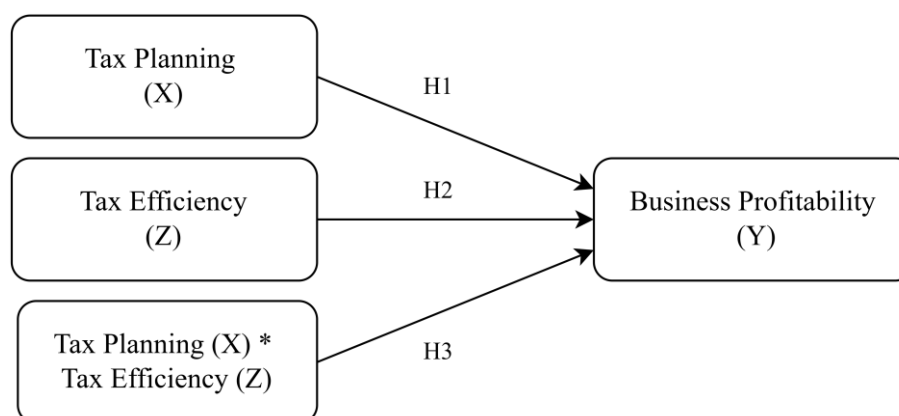


Figure 1. Research Method

METHODS

This study employs a quantitative approach to examine the relationships between variables through the analysis of numerical data obtained from company financial reports. A quantitative approach was chosen because the variables studied can be measured objectively and analyzed using statistical methods. This research is explanatory in nature, aiming to explain the causal relationship between tax planning and business profitability and to examine the role of tax efficiency in strengthening or weakening this relationship. This approach is used to gain an empirical understanding of the mechanisms of influence between variables based on testing previously formulated hypotheses (Sari et al., 2022).

The subjects of this study are coal-based energy sector companies listed on the Indonesia Stock Exchange. The study population includes all coal companies listed during the observation period. The sampling method used a purposive sampling technique, with the criteria being companies that consistently publish complete and audited annual financial reports from 2022 to 2024. Based on these criteria, three companies qualified as research samples: PT Adaro Energy Indonesia Tbk (ticker code ADRO), PT Bukit Asam Tbk (ticker code PTBA), and PT Indo Tambangraya Megah Tbk (ticker code ITMG). The three-year observation period was chosen to provide a snapshot of the current state of tax management practices and financial performance of coal sector companies.

The limited number of observations was due to the research's focus on coal energy companies, which require complete and consistent financial reports throughout the observation period. Despite the relatively small sample size, the use of moderated regression analysis remains relevant because this research is exploratory and focuses on testing conceptual relationships between variables in a specific sector.

In this study, tax planning is treated as an independent variable and measured using the effective tax rate as a proxy. The effective tax rate is used to indicate the proportion of income tax expense to a company's pre-tax profit. This ratio is widely used in tax research because it comprehensively illustrates a company's level of tax planning by comparing tax liabilities with its ability to generate pre-tax profit (Gulo & Mappadang, 2022). The effective tax rate is measured using the following formula:

$$ETR = \frac{\text{Income Tax Expense}}{\text{Profit Before Tax}}$$

Business profitability in this study serves as the dependent variable and is measured using return on assets. Return on assets is used to evaluate a company's ability to generate net income based on its total assets. This ratio reflects management efficiency in managing assets to generate profits and is often used as a key indicator in assessing a company's financial performance (Puspitasari et al., 2021). Return on assets is calculated using the following formula:

$$ROA = \frac{Net\ Profit}{Total\ Assets}$$

Tax efficiency in this study is used as a moderating variable and is measured by the ratio of income tax expense to operating profit. This measurement aims to indicate the extent to which the tax burden affects a company's operational performance. This ratio reflects a company's ability to manage its tax liabilities relative to profits earned from core activities, making it relevant for analyzing the relationship between tax planning and business profitability (Andoko & Angeline, 2023). Tax efficiency is calculated using the following formula:

$$Tax\ Efficiency = \frac{Income\ Tax\ Expense}{Operating\ Profit}$$

This study utilizes secondary data sourced from the company's annual financial reports. The data used includes information on profit before tax, income tax expense, net profit, operating profit, and total assets. The financial reports used as the basis are audited reports officially published by the company. Data were obtained from the official website of the Indonesia Stock Exchange (www.idx.co.id) and the official websites of each company. The use of secondary data was chosen because it is objective, verifiable, and has undergone an independent audit process, thus maintaining a high level of reliability.

The data analysis technique began with descriptive statistical analysis to provide an overview of the characteristics of the research data, such as the minimum, maximum, mean, and standard deviation values of each variable. This analysis was used to understand the distribution and variation of the data before conducting further testing. The next stage in this research was to test the classical assumptions, consisting of normality tests, multicollinearity tests, autocorrelation tests, and heteroscedasticity tests. The normality test aims to ensure that the residuals in the regression model are normally distributed. The multicollinearity test was conducted to determine whether there is a strong linear relationship between the independent variables. The autocorrelation test was used to assess whether the residuals between observation periods are independent. Meanwhile, the heteroscedasticity test was conducted to ensure that the residual variance remains constant (Nugraha, 2022).

After all classical assumptions were met, the analysis continued using Moderated Regression Analysis to examine the effect of tax planning on business profitability, with tax efficiency as a moderating variable. This method was used to determine the direct effect of each variable as well as the interaction effect between the independent and moderating variables on the dependent variable (Park & Yi, 2023). Hypothesis testing is carried out using three regression equations as follows:

$$\text{Equation 1: } ROA = \alpha + \beta_1 ETR + \epsilon$$

$$\text{Equation 2: } ROA = \alpha + \beta_2 EP + \epsilon$$

$$\text{Equation 3: } ROA = \alpha + \beta_1 ETR + \beta_2 EP + \beta_3 (ETR \times EP) + \epsilon$$

Where the constant α indicates the ROA value when all independent variables are zero. The coefficient β_1 indicates the magnitude of the change in ROA due to changes in ETR, assuming other variables remain constant. The coefficient β_2 indicates the magnitude of the change in ROA due to changes in Tax Efficiency. The coefficient β_3 indicates the role of Tax Efficiency in strengthening or weakening the effect of Tax Planning on ROA. The value of ϵ represents other factors outside the model that influence ROA.

RESULTS

This study utilizes financial report data from coal-based energy companies listed on the Indonesia Stock Exchange, namely PT Adaro Energy Indonesia Tbk, PT Bukit Asam Tbk, and PT Indo Tambangraya Megah Tbk. The observation period in this study covers the last three years, from 2022 to 2024. The number of observations used in this study is nine firm-years, obtained from a combination of three companies and three observation years. The data was processed using a quantitative statistical approach to examine the relationship between tax planning, tax efficiency, and business profitability.

The results of the descriptive statistical analysis are presented in Table 1, which contains the minimum, maximum, average, and standard deviation values for each study variable.

Table 1. Descriptive Statistical Analysis

Variable	N	Minimum	Maximum	Mean	Std. Deviation
[X] Tax planning (ETR)	9	0,179	0,368	0,231	0,055
[Y] Business Profitability (ROA)	9	0,095	0,454	0,216	0,109
[Z] Tax Efficiency	9	0,026	0,203	0,079	0,051

Based on Table 1, the tax planning variable, measured by the effective tax rate, has a minimum value of 0,179 and a maximum value of 0,368, with an average of 0,231. These values indicate that, in general, the sample companies pay an income tax burden of approximately 23 percent of their pre-tax profit. The relatively small standard deviation indicates that the level of tax planning between companies does not differ significantly during the observation period.

The business profitability variable, measured using return on assets, had a minimum value of 0,095 and a maximum value of 0,454, with an average of 0,216. These values indicate that the coal sector companies in the study sample were able to generate profits from their assets, with varying rates of return across companies and across observation periods. The larger standard deviation of return on assets compared to other variables indicates significant variation in profitability, consistent with the characteristics of the coal sector, which is affected by fluctuations in global commodity prices.

Meanwhile, the tax efficiency variable had a minimum value of 0,026 and a maximum value of 0,203, with an average of 0,079. This value indicates that, on average, the tax burden borne by companies was only approximately 7,9 percent of operating profit. The relatively small standard deviation indicates that tax efficiency levels across the sample companies tended to be fairly consistent throughout the study period.

Descriptive statistics show that coal sector companies have relatively stable levels of tax planning and tax efficiency, while business profitability shows greater variation. After conducting descriptive statistical analysis, the next stage is testing classical assumptions to ensure the feasibility of the regression model used.

Table 2. Classical Assumption Test Results

Variable	Tolerance	VIF	t	Sig.
[X] Tax planning (ETR)	0,149	6,717	-0,153	0,884
[Z] Tax Efficiency	0,177	5,642	1,434	0,211
[X*Z] Tax planning*Tax Efficiency Interaction	0,207	4,829	-1,029	0,351
Kolmogorov-Smirnov Test (Asymp. Sig.)		0,200 ^{c.d.}		
Glejser Test (Sig.)		> 0,05		
Durbin-Watson		2,396		

The results of the classical assumption test are presented in Table 2, including the results of normality, multicollinearity, and autocorrelation tests. The classical assumption test was conducted to ensure that the regression model met statistical requirements before testing the hypotheses using moderated regression analysis.

Multicollinearity testing was performed by examining the tolerance and variance inflation factor values for each independent variable and interaction variable. The test results, after mean centering, showed that all variables had tolerance values above 0,10 and variance inflation factors below 10. These results indicate that there is no significant linear relationship between the independent variables in the regression model, thus meeting the multicollinearity assumption.

A normality test was performed on the regression model residuals to ensure they were normally distributed. The Kolmogorov-Smirnov test yielded a significance value greater than 0,05. This result indicates that the residuals in the regression model are normally distributed, thus meeting the normality assumption, and the regression model can be used for further analysis.

The Glejser test results indicated that all independent and interaction variables had significance values above 0,05, thus concluding that the regression model does not experience heteroscedasticity. Meanwhile, the autocorrelation test was conducted using the Durbin-Watson statistic. The test yielded a Durbin-Watson value of 2,396. This value falls within the acceptable range for indicating the absence of autocorrelation in the residuals of the regression model. This result indicates that the residuals between observations are independent and do not exhibit any specific relationship pattern.

Based on the results of normality, multicollinearity, heteroscedasticity, and autocorrelation tests, it can be concluded that the regression model meets the required classical assumptions. After the classical assumptions were met, the analysis continued with moderated regression analysis to test the research hypotheses.

Table 3. Moderated Regression Analysis (MRA) Test Results

Variable	Regression Coefficient (B)	t	Sig.	Description
Constant	0,250	5,035	0,004	Significant
[X] Tax Planning (ETR)	-0,281	-0,153	0,884	Not significant
[Z] Tax Efficiency	2,601	1,434	0,211	Not significant
[X*Z] Interaction Tax planning*Tax Efficiency	-15,724	-1,029	0,351	Not significant

The results of the moderated regression analysis are presented in Table 3, which includes the regression coefficients, t-values, significance values, and descriptions of the hypothesis testing. The presentation of the results focuses on the regression coefficient test because the primary objective of the study was to examine the partial and moderating effects between variables.

The test results indicate that the tax planning variable, measured using the effective tax rate, has a negative regression coefficient with a significance level greater than 0,05. These results indicate that tax planning does not significantly influence business profitability. The first hypothesis, which states that tax planning influences business profitability, is not empirically supported.

The Tax Efficiency variable has a positive regression coefficient, but its significance level is greater than 0,05. This result indicates that tax efficiency does not significantly influence business profitability. The second hypothesis, which states that tax efficiency influences business profitability, is not supported.

The interaction variable between tax planning and tax efficiency has a negative regression coefficient with a significance level greater than 0,05. This result indicates that tax efficiency does not moderate the effect of tax planning on business profitability. The third hypothesis, which states that tax efficiency acts as a moderating variable, is not empirically supported.

Although the results table focuses on the regression coefficients, the model fit test results show that the regression model has an F-test significance value above 0,05 and a low coefficient of determination, indicating limited model explanatory power. This condition indicates that variations in business profitability of coal sector companies during the study period are more influenced by factors other than the tax variables tested in this study. Based on these test results, the estimated regression equation can be expressed as follows:

$$ROA = 0,250 - 0,281 ETR + 2,601 EP - 15,724 (ETR \times EP)$$

The regression equation shows that changes in business profitability are influenced by tax planning, tax efficiency, and the interaction between the two, although the resulting effect is not statistically significant. These results indicate that the profitability dynamics of coal sector companies during the study period were more influenced by factors other than tax policy, such as market conditions and the company's operational performance.

DISCUSSION

The Effect of Tax Planning on Business Profitability

The results of the first hypothesis test indicate that tax planning, proxied by the effective tax rate, does not significantly impact business profitability, as measured by return on assets. The regression coefficient shows a negative value with a significance level above the statistical test limit. This finding indicates that variations in the level of tax planning among coal sector companies during the study period are not directly related to the company's ability to generate profits from its assets.

This condition can be explained by the characteristics of the coal sector, which is highly dependent on fluctuations in global commodity prices. Changes in coal prices directly affect company revenue and profits, so the impact of internal policies such as tax planning is relatively less dominant in determining profitability levels. In situations where coal prices decline, company profitability can be depressed even if the company has implemented tax management practices. Conversely, when coal prices increase, corporate profits tend to increase regardless of the level of tax planning implemented.

This research finding aligns with the findings of Ekananda (2022) who showed that tax policy is not always related to profitability in natural resource-based companies because financial

performance is more influenced by external industry factors. However, this finding differs from the research of Chen et al. (2025), who found that tax strategy is related to financial performance in the non-commodity sector. These differences indicate that the effect of tax planning on profitability is sector-specific and highly dependent on the stability of revenue and the company's operational structure.

The Effect of Tax Efficiency on Business Profitability

The results of the second hypothesis test indicate that Tax Efficiency does not significantly influence Business Profitability. The regression coefficient indicates a positive trend, but the resulting significance level does not meet the statistical test criteria. This finding indicates that a company's ability to manage its tax burden on operating profit is not directly related to the return on assets generated by coal sector companies during the study period.

The capital-intensive operational structure of coal companies, which is highly dependent on production volume and commodity selling prices, is one factor explaining this result. Under these conditions, company profitability is determined more by operational efficiency, production scale, and market conditions than by tax efficiency on operating profit. The relatively small tax burden compared to total operating costs and fluctuations in revenue mean that tax efficiency is not a primary factor in increasing business profitability.

This finding aligns with research by Abaidoo (2019), which states that tax efficiency does not always affect financial performance when companies operate in sectors heavily influenced by external factors. However, this result differs from research by Aamir et al. (2025) in the manufacturing and service sectors, which found a relationship between tax efficiency and profitability. These differences indicate that the effect of tax efficiency on profitability is highly dependent on the characteristics of the industrial sector and the company's cost structure.

Tax Efficiency as a Moderating Variable for the Effect of Tax Planning on Business Profitability

The results of the third hypothesis test indicate that tax efficiency does not moderate the effect of tax planning on business profitability. The interaction coefficient between the effective tax rate and tax efficiency is negative, with a significance level that does not meet the statistical test criteria. This finding indicates that variations in tax efficiency levels neither strengthen nor weaken the relationship between tax planning and business profitability in coal sector companies during the study period.

These results indicate that although companies are able to efficiently manage their tax burdens relative to operating profit, this condition is not strong enough to alter the relationship between tax planning policies and financial performance. In the coal sector, profitability dynamics are more determined by changes in commodity prices and global market conditions than by the interaction between tax policy and tax management efficiency. As a result, the role of tax efficiency as a moderating variable does not emerge empirically in the research model.

This finding aligns with research by Ibrahimov et al. (2025), which states that tax variables do not always act as moderators when company profitability is heavily influenced by external industry factors. External factors such as inflation, interest rates, and exchange rates exert a more dominant influence on company profitability than tax policy. However, these results differ from those of Onwughai & Ofili (2025); Tanko (2025), who found that tax policy characteristics and corporate governance can influence the relationship between tax strategy and financial

performance. These differences indicate that the effectiveness of tax moderating variables is highly dependent on the industrial sector, the indicators used, and the operational structure of the companies studied.

The insignificant effect of tax variables in this study does not indicate that tax policy is irrelevant, but rather indicates that in commodity-based sectors, profitability is more sensitive to external factors than to internal company policies. This finding reinforces the view that the effectiveness of tax policy is contextual and sector-specific.

CONCLUSION

The results of this study indicate that tax planning, as proxied by the effective tax rate, did not significantly impact business profitability, as measured by return on assets, for coal-fired energy companies during the period 2022 to 2024. This finding indicates that differences in the level of tax planning between companies are not directly related to the company's ability to generate profits from its assets. Tax efficiency, as measured by the ratio of income tax expense to operating profit, also did not significantly impact business profitability. Therefore, it can be concluded that managing tax expense relative to operating profit is not yet a determining factor in a company's return on assets. The results of the interaction test between tax planning and tax efficiency indicate that tax efficiency does not act as a moderating variable in the relationship between tax planning and business profitability. This finding indicates that variations in tax efficiency levels neither strengthen nor weaken the effect of tax planning on the profitability of coal-fired energy companies during the study period.

The implications of this study indicate that tax management policies in coal-fired energy companies are not directly related to business profitability. From a practical perspective, these results suggest that company management needs to position tax policy as part of a financial strategy integrated with operational management and market dynamics. From a theoretical perspective, the results of this study enrich the study of corporate taxation by demonstrating that the relationship between tax policy and business profitability is not always straightforward in the commodity-based industrial sector.

This study is limited by its relatively small sample size and observation period of only three years, so the findings cannot be broadly generalized. The study also used a single proxy for each variable, thus not fully reflecting the complexity of tax policy and the financial performance of coal-based companies.

Future research is recommended to increase the sample size and extend the observation period for stronger generalizability. Furthermore, further research could use alternative proxies to measure tax planning, tax efficiency, and business profitability, as well as consider other variables related to operational characteristics and market conditions in the studied industrial sector. For regulators, the results of this study demonstrate that fiscal policy in the coal sector needs to consider the industry's fluctuating characteristics so that it focuses not only on increasing tax revenue but also on maintaining sustainable company performance.

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