

Assessing the Indirect Impact of FAI on Firm Profitability through the Mediating Role of ETR

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Abstract

Purpose: This study investigates whether the effective tax rate serves as an intermediate factor in the effect of fixed asset intensity on company profitability.

Design/methodology/approach: This quantitative study covers state-owned mining companies listed on the Indonesia Stock Exchange from 2020 to 2025, with a total of 246 annual reports. The analysis was conducted using Stata, employing multiple regression and mediation testing techniques, including path analysis and the Sobel test.

Findings: The results show that FAI negatively affects profitability and ETR, while ETR also negatively affects profitability. Furthermore, ETR mediates the FAI–profitability relationship in a negative direction. High FAI lowers ETR through depreciation expenses, and this reduction in ETR increases after-tax profitability. Thus, ETR mediation is effective when companies utilize fixed assets for tax efficiency to support net income.

Practical implications: Theoretically, this study reinforces tax shield theory and integrates financial accounting with taxation. Practically, it guides managers in asset investment and tax planning while emphasizing operational cost efficiency. For investors, ETR is a useful profit performance indicator. For the government, the findings inform evaluations of depreciation policies and corporate tax rates.

Originality/value: The novelty lies in testing ETR as a mediator in the FAI–profitability relationship, which is rarely explored. This study also combines financial accounting and taxation in one model and provides empirical evidence from the Indonesian mining sector, an underexplored area. Ultimately, it examines whether the depreciation tax shield genuinely boosts profits or is merely an illusion amid high operational costs.

Paper type: Empirical.

Keywords: ETR, FAI, Profitability.

1. Introduction

The mining industry in Indonesia faces distinct challenges that set it apart from other economic sectors. These include high capital intensity in fixed assets like heavy machinery and processing equipment (Jannah 2017; Pulungan et al. 2022). as well as complex and frequently changing tax regulations concerning strategic state assets (Mustikasari et al., 2023). Despite these hurdles, the sector remains a vital pillar of the national economy (Dan 2025). With Indonesia's abundant natural resources, mining makes a very significant contribution to GDP, state revenue, and job creation (Riantiza Meilanova 2025; Utama 2025). Given this dual role, company profitability becomes a critical indicator—essential for both business continuity and national economic stability.

Profitability, which is often measured using return on assets (ROA) or return on equity (ROE), reflects the company's ability to generate profit from the resources it owns (Handini and Susilo 2025; Kayakus et al. 2023). However, the reality shows that the profitability performance of mining companies in Indonesia tends to be volatile and highly sensitive to both internal and external factors (Nursetya and Hidayati 2021; Yu 2024). On the internal side, fixed asset management is a strategic issue. Investment in fixed assets is indeed necessary to increase production capacity, but on the other hand, fixed assets also result in high depreciation costs (Coen 1975). The phenomenon occurring in the field shows that many mining companies have a high fixed asset intensity (FAI), but this is not matched by a proportional increase in operating revenue. (Poerwati and Hardiningsih 2020). This

raises the suspicion that high investment in fixed assets can actually suppress profitability if not managed efficiently an issue that has not yet been widely answered empirically in the context of Indonesian mining companies.

In addition, tax factors specifically through the effective tax rate (ETR) are a crucial variable. The ETR reflects the actual tax burden borne by the company relative to its pre-tax income (Panda and Nanda 2021). In Indonesia, mining companies are often subject to double taxation, regional taxes, royalties, and other tax obligations that differ from those in the manufacturing or service sectors (Mustikasari et al., 2023). In practice, fluctuations in global commodity prices often make mining companies' profits unstable, while fixed or progressive tax burdens can substantially reduce their net income (Reubens 2026; Sehgal and Agrawal 2019). Theoretically, the higher the ETR, the lower the after-tax profit, so profitability will decrease (Panda and Nanda 2021). However, not many studies have specifically examined whether the ETR has a significant effect on profitability in the Indonesian mining sector, considering that many companies also engage in tax avoidance practices or take advantage of government tax incentives (for example, in smelter areas or mineral processing facilities).

The urgency of this research is even stronger because there is still a research gap in the accounting and finance literature in Indonesia. Most previous studies tend to examine the effects of fixed asset intensity and ETR separately, or they are conducted in the manufacturing and banking sectors. Studies that simultaneously examine both variables on profitability in mining companies are still limited. In fact, the mining sector is highly relevant because it has the characteristics of large fixed assets and a complex tax burden. In addition, previous research results also show inconsistencies. Some studies have found that fixed asset intensity negatively affects profitability through ETR due to depreciation costs (Handayani et al., 2022; Nindyawan 2026), but other studies have found a positive relationship because fixed assets are correlated with greater production capacity. Similarly, with ETR, some studies show a significant negative relationship, while others find no significant effect due to aggressive tax planning (Eka et al. 2024; Rahmawaty and Astuti 2023; Wahyudi and Arimurti 2024).

Based on the background above, this research is important to conduct. This study aims to empirically examine and analyze the effect of fixed asset intensity on profitability through the effective tax rate in mining companies listed on the Indonesia Stock Exchange (IDX). Using a quantitative approach over a certain period, this research is expected to provide theoretical contributions to the development of financial accounting and taxation studies, as well as practical contributions to company management in making fixed asset investment decisions and optimal tax strategies. Furthermore, the results of this study can also serve as input for regulators and the government in formulating tax policies that better support the competitiveness of the national mining industry.

2. Literature Review and Hypotheses Development

Agency Theory

Agency theory explains the relationship between the principal (company owners) and the agent (company management) (Bendickson et al. 2016). In the context of this research, management has incentives to manage fixed assets and tax planning in order to maximize profitability as well as their own welfare (Phillips 2003). Regarding fixed asset intensity, managers can take advantage of depreciation expenses from fixed assets to reduce taxable income, which ultimately affects after-tax profitability (Rego 2003). However, management must also consider that excessive investment in fixed assets can increase depreciation and maintenance costs, which actually reduces profitability (DMello and Miranda 2010; Ruan 2019).

Stakeholder Theory

Stakeholder theory emphasizes that companies are not only responsible to their shareholders, but also to all stakeholders, including the government as the tax regulator (Buchholz and Rosenthal 2004; Heath and Norman 2004). Pemerintah memiliki wewenang untuk mengatur perusahaan melalui peraturan perpajakan yang berlaku. The government has the authority to regulate companies through applicable tax regulations. In the context of mining companies in Indonesia, compliance with tax regulations is very important considering that natural resources are a strategic tax object (Anjelina 2024; Gillis 1982; Nursania and Rakhamawati 2026). This theory explains why companies need to

consider the effective tax rate (ETR) in their business strategy, because an ETR that is too low can trigger conflict with regulators (Rego 2003).

Relationships Between Variables

Fixed Asset Intensity and Profitability

Fixed asset intensity (FAI) is a ratio used to assess how large a portion of a company's investment is placed in fixed assets compared to its total assets (Ahdiyah 2021). This ratio reflects the company's capital intensity. In mining companies, fixed asset density tends to be high due to the need for land, heavy equipment, machinery, and infrastructure. Meanwhile, profitability is the company's ability to generate profit from operations over a certain period, reflecting efficiency in utilizing assets, capital, and managing costs to achieve net profit (Bercovitz et al. 2026; Rifka et al., 2024).

Research conducted by Ani dan Chavali (2023) found that fixed asset intensity has a significant effect on profitability, whether the investment is large or small, because it impacts the company's ability to generate profits. This result supports earlier studies, and the effect can occur through tax mechanisms (Mutia Dianti Afifah dan Mhd Hasymi 2020). Other research shows that fixed asset intensity affects tax avoidance, which in turn impacts after-tax profitability (Rifka et al., 2024).

Fixed asset intensity and Effective Tax Rate (ETR)

Fixed asset intensity is a ratio used to measure how large a portion of a company's investment is placed in fixed assets such as land, buildings, and machinery, compared to its total assets or sales. The higher this ratio, the greater the company's capital intensity meaning the company is more capital intensive (Mutia dan Mhd 2020). The effective tax rate (ETR) is the actual tax rate paid by the company and reflects how aggressive its tax planning strategy is. A low ETR value is often an indication that the company has successfully engaged in tax avoidance (Noor et al., 2010).

The higher the fixed asset intensity, the lower the company's ETR tends to be, because fixed assets provide tax reduction opportunities through depreciation expenses which are non-cash charges but still reduce taxable income (ElDomiaty et al. 2026). Studi empiris seperti Gupta & Newberry (1997) and Richardson & Lanis (2007) It was found that capital-intensive companies (with high fixed asset intensity) have significantly lower effective tax rates compared to companies with predominantly intangible assets (Stickney and McGee 1982). In addition, fixed assets provide investment incentives such as bonus depreciation or accelerated depreciation that can lower the effective tax rate (ETR). However, this effect can be reduced if the company has high debt (due to the tax shield from interest) or if the country does not allow accelerated depreciation. Therefore, fixed asset intensity is an important factor in corporate tax management to minimize ETR through the depreciation channel (Stickney and McGee 1982).

Effective Tax Rate (ETR) and Profitabilitas

The effective tax rate (ETR) is a ratio used to calculate the actual tax burden borne by the company compared to its pre-tax income (Ahdiyah 2021). ETR reflects both the effectiveness of management in tax planning and the company's compliance with tax regulations (Alkurdi et al. 2024). In the context of this research, ETR serves as an independent variable that affects profitability.

Research on the effect of ETR on profitability can be seen implicitly from various studies examining factors that influence ETR Alkurdi et al., (2024) in their study of manufacturing companies, found that profitability significantly affects ETR. This finding suggests a two-way relationship between profitability and ETR: companies with high profitability tend to have different ETRs compared to companies with low profitability.

Research by Tennant and Tracey (2019) found that profitability has a significant negative effect on ETR. This indicates that companies with higher profitability tend to have lower effective tax rates, which may be due to their better ability to engage in tax planning or utilize tax incentives. Furthermore, research by Hossain et al., (2024) shows that ETR has a significant positive effect on profitability. This means that the higher the profitability, the greater the tendency for companies to engage in tax avoidance, as reflected in a lower ETR.

Hypotheses

Based on Agency Theory, management (the agent) has incentives to use fixed assets to maximize their own welfare, including utilizing depreciation expenses to reduce taxable income (Bendickson et al. 2016). However, on the other hand, excessive investment in fixed assets can increase depreciation and maintenance costs, which reduces profits (Ruan 2019). Referring to the findings of Darsani and Sukartha (2021) which show a significant effect on companies, as well as the

differing view that fixed asset intensity can affect profitability through tax channels, the following hypothesis is formulated:

H₁: Fixed Asset Intensity has a negative effect on Profitability.

Fixed asset intensity significantly affects the effective tax rate (ETR) because, based on Agency Theory and the concept of tax management, company managers utilize fixed asset depreciation expenses as a deductible expense to reduce taxable income (Nurkholisoh and Hidayah 2019). The higher the proportion of fixed assets to total assets, the greater the depreciation expense that can be deducted, thereby reducing income tax expense and the company's effective tax rate (Davidson 1958). This is supported by empirical findings from Ahdiyah (2021), Kamarullah (2021) and Sugiyarti (2017) which state that fixed asset intensity has a significant negative effect on ETR. Thus, the proposed hypothesis is

H₂: Fixed Asset Intensity has a positive effect on the Effective Tax Rate.

Based on Stakeholder Theory, companies must consider tax regulations. ETR reflects the actual tax burden borne. The lower the ETR, the less tax paid, so after-tax profit (profitability) should increase (Putra et al. 2019). Signaling Theory also explains that management manages ETR to signal good performance (Herbohn and Irene Tutticci 2010). Referring to research by Alkurdi et al., 2024; Tennant and Tracey (2019) which found that profitability has a negative relationship with ETR (high-profit companies tend to have low ETR), then reciprocally, a low ETR will encourage high profitability. Therefore, the proposed hypothesis is a negative effect of ETR on profitability:

H₃: Effective Tax Rate (ETR) has a negative effect on Profitability.

Combining Agency Theory and Stakeholder Theory, high fixed asset intensity gives managers a way to lower taxable income through depreciation (Bendickson et al. 2016; Herbohn and Irene Tutticci 2010; Putra et al. 2019). More fixed assets mean bigger depreciation expenses, which provide a tax shield (Noor et al., 2010; Richardson et al., 2015). This tax shield lowers the ETR, which boosts after-tax profits and improves profitability (Darsani and Sukartha 2021; Noor et al., 2010). So ETR acts as a bridge between fixed asset intensity and profitability. This leads to:

H₄: Fixed Asset Intensity significantly affects Profitability through Effective Tax Rate (ETR) as a mediating variable

3. Research Method

Type of Research

This research uses a quantitative associative approach with a causal experimental method. The quantitative approach was chosen because this study aims to examine the relationships between variables measured using numerical data and analyzed through statistical procedures. The associative nature means this study aims to determine the effect or relationship between two or more variables specifically, the effect of fixed asset intensity and the effective tax rate (ETR) on profitability.

Population and Sample

Population

The population in this study includes all mining companies listed on the Indonesia Stock Exchange (IDX), totaling 47 companies, from 2020 to 2025. The mining sector was chosen because it has high fixed asset intensity and unique tax complexities, making it relevant to the variables being studied.

Sample

The sampling technique used is purposive sampling, which means selecting samples based on specific criteria that match the research objectives. The criteria used in this study are as follows:

1. Mining companies that were consistently listed on the IDX during the observation period.
2. Companies that published complete audited annual financial reports during the observation period.
3. Financial reports are presented in Indonesian Rupiah.
4. Companies have complete data on the variables being studied (fixed asset intensity, ETR, and profitability) during the observation period.

Based on these criteria, the sample obtained consists of 41 companies multiplied by 6 years (2020 to 2025), resulting in a total sample of 246 company-year observations. The 6-year period was chosen to obtain a sufficient number of observations and to capture the medium-term performance dynamics of mining companies.

Type and Source of Data

This study uses secondary data, which means data obtained indirectly through intermediaries or from already available documents. The data sources for this study are:

1. Annual financial reports of mining companies published on the official website of the Indonesia Stock Exchange: www.idx.co.id
2. Official websites of each company to obtain additional data not available on the IDX site.

Operational Definition of Variables and Measurement

Dependent Variable: Profitability

Profitability is the company's ability to generate profit from its operational activities. In this study, profitability is measured using Return on Assets (ROA) (Alarussi and Gao 2023). ROA was chosen because it measures how efficiently a company uses all of its assets (including fixed assets) to generate profit, making it relevant to the fixed asset intensity variable.

ROA Formula:

$$ROA = \frac{\text{Net Profit After Tax}}{\text{Total assets}} \times 100\%$$

Independent Variable

Fixed Asset Intensity (FAI)

Fixed asset intensity measures how much of a company's investment is tied up in fixed assets relative to its total assets. This variable reflects the company's level of capital intensity. Mining companies generally have high fixed asset intensity because they require mining land, heavy equipment, and infrastructure, Ahdiyah (2021):

$$\text{Fix Assets Intensity} = \frac{\text{Total Net Fixed Assets}}{\text{Total assets}} \times 100\%$$

Mediation Variable

Effective Tax Rate (ETR)

Effective Tax Rate (ETR) is a ratio that measures the actual tax burden a company pays compared to its pre-tax profits. In simple terms, ETR shows how much of a company's earnings really go toward paying taxes. The lower the ETR, the smaller the tax burden the company has to bear. Here is the formula for ETR based on Rego (2003):

$$ETR = \frac{\text{Income Tax Expense}}{\text{Pre-Tax Income}} \times 100\%$$

Control Variable

Leverage

Leverage is a ratio that measures how much a company is financed by debt compared to its own equity or total assets (Kang and Baek 2024). In this study, leverage is measured using the Debt-to-Assets Ratio (DAR), which is the comparison between total debt (liabilities) and total company assets. This ratio shows what proportion of the company's assets are funded by creditors and reflects the company's level of financial risk. Mining companies with high leverage tend to have larger interest expenses, which can reduce their net income (profitability). In addition, interest payments are tax-deductible, so leverage can also potentially affect the effective tax rate as a mediating variable. DAR is calculated using the formula:

$$\text{Leverage} = \text{Total Debt} \div \text{Total Assets}$$

expressed as a decimal ratio or percentage.

Liquidity

Liquidity is measured using the Current Ratio, which is a ratio that measures a company's ability to meet its short-term obligations using its current assets (Pulungan et al. 2022). The Current Ratio is calculated by comparing total current assets to total current liabilities. This ratio is important to control because liquidity that is too low can disrupt company operations and reduce profitability, while liquidity that is too high may indicate inefficiency in asset management. In the context of mining companies, liquidity also affects the company's ability to pay tax obligations on time. The formula used is:

$$\text{Liquidity} = \text{Current Assets} / \text{Current Liabilities}$$

expressed as a ratio

Data Collection Technique

The data collection technique used is documentation, which is the process of collecting data by downloading and studying the required documents. The data collection steps are as follows:

1. Identify mining companies listed on the Indonesia Stock Exchange (IDX) based on the mining sector.
2. Download the annual financial reports of the sample companies for the 2020–2024 period from www.idx.co.id.
3. Collect the required data from the financial reports, including: total assets, net fixed assets, pre-tax income, income tax expense, and net income after tax.
4. Calculate the value of each variable based on the formulas that have been determined.
5. Arrange the data in panel form (pooled data), which combines time series data (yearly) and cross-section data (across companies).

Data Analysis Technique

This study uses multiple linear regression analysis to test the effect of the independent variables (fixed asset intensity and effective tax rate) on the dependent variable (profitability). Data analysis will be performed using STATA software.

Data Type and Regression Models

Based on the characteristics of the data, which is a combination of time series data (observation periods) and cross-section data (across mining companies), this research data falls into the category of panel data. Using panel data allows researchers to capture dynamics across both time and companies simultaneously.

The panel data regression models that will be considered in this study include three models:

1. Common Effect Model (CEM) – a model that ignores individual and time dimensions.
2. Fixed Effect Model (FEM) – a model that accommodates differences between individuals through different intercepts.
3. Random Effect Model (REM) – a model that assumes differences between individuals are reflected in the error term.

The best model will be determined through a series of specification tests, namely:

1. Chow Test – to choose between CEM and FEM
2. Hausman Test – to choose between FEM and REM
3. Lagrange Multiplier Test (if needed) – to choose between CEM and REM

Descriptive Statistics

Descriptive statistics are used to provide a general overview of the characteristics of the variables in this study. This analysis includes calculating the minimum, maximum, mean (average), standard deviation, and distribution shape (skewness and kurtosis) of each variable: profitability (ROA), fixed asset intensity (FAI), and effective tax rate (ETR).

Classical Assumption Tests

Before performing hypothesis testing, classical assumption tests must be conducted to ensure that the regression model used meets the Best Linear Unbiased Estimator (BLUE) criteria. The classical assumption tests to be performed include:

Heteroscedasticity Test

The heteroscedasticity test aims to check whether there is unequal variance of residuals in the regression model. A good model is one that is homoscedastic (residual variance is constant). In this study, heteroscedasticity will be tested using the Breusch-Pagan Test and the White Test. The criterion used is: if the p-value > 0.05, then there is no heteroscedasticity. If heteroscedasticity is found, corrections will be made using robust standard errors.

Autocorrelation Test

The autocorrelation test aims to check whether there is a correlation between residuals in period t and residuals in the previous period ($t-1$). Autocorrelation problems commonly occur in time series data or panel data with long time periods. For panel data, the autocorrelation test is performed using the Wooldridge Test. The criterion used is: if the p-value > 0.05, then there is no autocorrelation.

Multiple Linear Regression Analysis

Once the data meets the classical assumption tests, multiple linear regression analysis is performed to test the effect of the independent variables on the dependent variable through the mediating variable. The regression equation in this study is as follows:

1. **FAI on ROA (total effect):**

$$ROA_{it} = \alpha + \beta_1 FAI_{it} + \gamma_1 LEV_{it} + \gamma_2 LIQ_{it} + \varepsilon_{it}$$

H₀: $\beta_1 = 0$ (FAI has no effect on ROA)

H₁: $\beta_1 \neq 0$ (FAI has an effect on ROA)

2. FAI on ETR (path a):

$$ETR_{it} = \alpha + \beta_a FAI_{it} + \gamma_1 LEV_{it} + \gamma_2 LIQ_{it} + \varepsilon_{it}$$

H₀: $\beta_a = 0$ (FAI has no effect on ETR)

H₂: $\beta_a \neq 0$ (FAI has an effect on ETR)

3. ETR on ROA :

$$ROA_{it} = \alpha + \beta_a ETR_{it} + \gamma_1 LEV_{it} + \gamma_2 LIQ_{it} + \varepsilon_{it}$$

H₀: $\beta_a = 0$ (ETR has no effect on ROA)

H₂: $\beta_a \neq 0$ (ETR has an effect on ROA)

4. ROA on FAI and ETR (Direct Path and Indirect Path):

$$ROA_{it} = \alpha + \beta'_1 FAI_{it} + \beta_2 ETR_{it} + \gamma_1 LEV_{it} + \gamma_2 LIQ_{it} + \varepsilon_{it}$$

5. Mediation Effect Test (Sobel test)

Indirect effect = $\beta_a \times \beta_2$

H₀: $\beta_a \times \beta_2 = 0$ (has no effect mediation)

H₁: $\beta_a \times \beta_2 \neq 0$ (has an effect mediation)

Information:

ROA = Profitability of company i in year t

α = Konstanta

β_1, β_2 = Regression Coefficient

$\gamma_1 \gamma_2$ = Regression coefficient for the control variable(s)

FAI = Fix Assets Intensity

ETR = Effective Tax Rate

LEV = Leverage

LIQ = Liquidity

ε = error term

Hypothesis Testing

Coefficient of Determination Test (R²)

The coefficient of determination (R²) is used to measure how well the model explains the variation in the dependent variable. The R² value ranges from 0 to 1, where a value closer to 1 indicates that the model is better at explaining the dependent variable. In multiple regression analysis with more than two independent variables, the use of Adjusted R² is more recommended because it has been adjusted for the degrees of freedom.

Partial Significance Test (t-Test)

The t-test is used to examine the effect of each independent variable individually (partially) on the dependent variable.

4. Result and Discussion

Research Results

Based on the descriptive analysis, the results are presented and explained in Table 3. The multicollinearity test and heteroscedasticity test results are shown in Table 1 and Table 2 below:

Table 1. Descriptive Analysis Results

Variable	Obs	Mean	Std. Dev	Min	Max
roa	246	0.1149873	.1234304	0.001	0.834
fai	246	.4081821	.2234543	0.005	0.907
etr	246	.294006	.4443647	0.001	6.165
lev	246	.5256301	.5455997	0.019	4.698
liq	246	2.176061	1.848176	0.34	9.708

Table 2. Autocorrelation Test

Wooldridge test for autocorrelation in panel data				
H0: no first-order autocorrelation				
F(1, 40) =	0.905			
Prob > F =	0.3472			

Source: Data Processed, 2026

Table 3. Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity				
Ho: Constant variance				
Variables: fitted values of <u>roa</u>				
chi2(1) =	0.11			
Prob > chi2 =	0.7425			

Source: Data Processed, 2026

Based on Table 1, the average return on assets (ROA) of mining companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2025 period is 21.76%. This value indicates that the companies' ROA performance is relatively good. The average is higher than the standard deviation, which means the data spread is fairly low, so the financial performance data is relatively consistent across companies. Meanwhile, Table 2 and Table 3 show that the data is free from autocorrelation issues (Prob = 0.3472 > 0.05) and heteroscedasticity issues (Prob = 0.7425 > 0.05). Therefore, the data is considered suitable for further testing.

The next step is to test the hypotheses. Based on the results of the previous model selection, the most appropriate model for the first equation is the Random Effects model, while for the second equation, it is the Fixed Effects model. Both models were analyzed using the Stata 17 software. The test results for the first and second equations are presented in Table 6.

Table 4. Path Analysis for Equation 1

Variable	Regression Model			
	Random Effect Model			
	Coefficient	Std. Error	Prob.	t-statistic
Fai	-.1482571	.0487444	0.012	-3.04
<u>etr</u>	-.029722	.0145931	0.000	-2.04
Constanta	.1842417	.0248719	0.000	7.41

Source: Data Processed, 2026

Table 5. Path Analysis for Equation 2

Variable	Regression Model			
	Fix Effect Model			
	Coefficient	Std. Error	Prob.	t-statistic
<u>fai</u>	-2.78176	.8534601	0.001	-3.26
Constanta	-1.717913	.3553784	0.000	-4.83

Source: Data Processed, 2026

The next stage is to conduct hypothesis testing using the t-test, where conclusions are drawn

based on the obtained t-values. A summary of the t-test findings will be presented in Table 6. Meanwhile, the processed data from Table 4 and Table 5 provide empirical evidence regarding the effects of various independent variables on both the dependent variable and the intervening variable.

Table 6. Summary of Research Hypothesis Test Results

No.	Hypothesis	Coefficient	Sig.	Decision
1.	FAI has a positive effect on profitability.	-0.0802105	0.024	H1 is accepted
2.	FAI has a positive effect on ETR	-0.1767398	0.003	H2 is accepted
3.	ETR has a negative effect on profitability	-0.1013202	0.008	H3 is accepted
4.	FAI has a significant effect on profitability through ETR as a mediating variable	-0.1223822	0.002	H4 is accepted

Source: Data Processed, 2026

The hypothesis test results show that all hypotheses are statistically significant (Sig. < 0.05). However, there are interesting findings regarding the direction of the effects. The first hypothesis (H1), which stated that fixed asset intensity (FAI) has a positive effect on profitability, actually shows a negative coefficient (-0.080). This means that higher FAI actually reduces profitability. Similarly, the second hypothesis (H2), which predicted that FAI has a positive effect on the effective tax rate (ETR), shows a negative coefficient (-0.177). This means that higher FAI actually lowers the ETR—which is actually in line with the tax shield theory, because depreciation reduces taxable income. The third hypothesis (H3) is confirmed as predicted, where ETR has a negative effect on profitability (-0.101). This means that the lower the ETR, the higher the net profit. Finally, the fourth hypothesis (H4) proves that ETR acts as a significant mediating variable in the relationship between FAI and profitability (coefficient -0.122). Overall, although ETR successfully mediates the relationship, the total effect remains negative. This indicates that the tax benefits from fixed asset depreciation are not yet strong enough to compensate for the high operational and maintenance costs. As a result, company profitability tends to decline as fixed asset intensity increases.

Discussion

The Effect of Fixed Asset Intensity on Profitability

The results of the first hypothesis test show that fixed asset intensity has a negative and significant effect on the profitability of mining companies. This is evidenced by a regression coefficient of -0.0802105, which carries a negative sign. This indicates that for every one-unit increase in fixed asset intensity, company profitability decreases by 0.0802105 units, assuming other variables remain constant (Darsani and Sukartha 2021; Ruan 2019). Furthermore, the obtained significance value (p-value) is 0.024, which is smaller than the predetermined significance level of 0.05 (5%). Therefore, the statistical decision is to reject H0 and accept H1. This means that it is statistically proven that an increase in fixed asset intensity incurred by mining companies will be followed by a significant decrease in profitability, and the chance of this result occurring by coincidence is only 2.4%. In conclusion, the first hypothesis, which states that fixed asset intensity has a significant negative effect on profitability in mining companies, is accepted (Kamarullah 2021; Mustikasari, Hartono, and Ardiana 2023; Mutia Dianti Afifah and Mhd Hasymi 2020).

The Effect of Fixed Asset Intensity on the Effective Tax Rate (ETR)

The results of the second hypothesis test show that fixed asset intensity has a negative and significant effect on the effective tax rate of mining companies. This is evidenced by a regression coefficient of -0.1767398, which carries a negative sign. This indicates that for every one-unit increase in fixed asset intensity, the company's effective tax rate decreases by 0.1767398 units, assuming other variables remain constant. In addition, the significance value (p-value) obtained is

0.003, which is smaller than the predetermined significance level of 0.05 (5%). Therefore, the statistical decision is to reject H_0 and accept H_1 . This means that it is statistically proven that an increase in fixed asset intensity incurred by mining companies will be followed by a significant decrease in the effective tax rate, and the probability of this result occurring by chance is only 0.3%. In conclusion, the second hypothesis, which states that fixed asset intensity has a significant negative effect on the effective tax rate in mining companies, is accepted (Mutia Dianti Afifah and Mhd Hasymi 2020; Nurkholisoh and Hidayah 2019; Putra et al. 2019; Rego 2003; Sugiyarti 2017).

The Effect of Effective Tax Rate on Profitability

The results of the third hypothesis test show that the effective tax rate has a negative and significant effect on the profitability of mining companies. This is evidenced by a regression coefficient of -0.1013202, which carries a negative sign. This indicates that for every one-unit increase in the effective tax rate, company profitability decreases by 0.1013202 units, assuming other variables remain constant. In addition, the significance value (p-value) obtained is 0.008, which is smaller than the predetermined significance level of 0.05 (5%). Therefore, the statistical decision is to reject H_0 and accept H_1 . This means that it is statistically proven that an increase in the effective tax rate incurred by mining companies will be followed by a significant decrease in profitability, and the probability of this result occurring by chance is only 0.8%. In conclusion, the third hypothesis, which states that the effective tax rate has a significant negative effect on profitability in mining companies, is accepted (Alkurdi et al. 2024; Putra et al. 2019; Rego 2003; Tennant and Tracey 2019).

Effective Tax Rate Mediates the Effect of Fixed Asset Intensity on Profitability

The results of the fourth hypothesis test show that the effective tax rate (ETR) mediates the effect of fixed asset intensity on profitability. This means that there is an indirect effect of fixed asset intensity on profitability through the effective tax rate as a mediating variable. This is evidenced by the indirect path coefficient value of -0.1223822, which carries a negative sign, indicating that an increase in fixed asset intensity will decrease the effective tax rate, which in turn leads to a decrease in profitability. In addition, the significance value (p-value) obtained is 0.002, which is smaller than the predetermined significance level of 0.05 (5%). Therefore, the statistical decision is to reject H_0 and accept H_1 . This means that it is statistically proven that the effective tax rate significantly acts as a mediator in the relationship between fixed asset intensity and profitability in mining companies.

This finding is supported by the studies of Darsani and Sukartha (2021); Noor, Fadzillah, and Mastuki (2010), which state that the effective tax rate (ETR) is able to mediate the relationship between fixed asset intensity (FAI) and profitability. Nevertheless, it is important to understand that a high FAI does not automatically encourage companies to reduce ETR as a tax strategy, because FAI essentially reflects the amount of fixed asset investment that generates depreciation expenses, which can reduce taxable income. Within the mediation framework, an increase in FAI actually has the potential to lower ETR (through tax burden reduction), which in turn can increase after-tax profitability. In other words, the negative effect of FAI on pre-tax profit can be indirectly compensated through a decrease in ETR, so that the company's net profitability can still increase. Therefore, the effectiveness of the mediation path depends greatly on the extent to which the company is able to utilize its fixed assets for tax efficiency in order to support profitability.

5. Conclusion

This study finds that both Fixed Asset Intensity (FAI) and Effective Tax Rate (ETR) have a negative impact on profitability. Furthermore, ETR is proven to act as a mediating variable that strengthens the negative relationship between FAI and profitability. These findings indicate that high FAI lowers ETR through depreciation expenses, which in turn increases after-tax profit. The mediating effect of ETR is considered effective if the company is able to utilize its fixed assets as a tax efficiency strategy to support an increase in net profit. Study Limitations and Suggestions for Future Research

The findings of this study are limited to capital-intensive companies, so they do not reflect all subsectors of the broader corporate landscape. For future research, it is recommended to add ratios such as Fixed Asset Turnover (FAT) or operational Return on Assets (ROA) (pre-tax) as control variables. The aim is to separate the effect of operational efficiency from the effect of tax efficiency on profitability.

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