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How Capital Intensity, Sales Growth, and Inventory Intensity Influence Tax Aggressiveness

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ABSTRACT

Taxation constitutes a major component of government revenue, serving as a crucial instrument for financing public expenditures and supporting national development programs. On the other hand, corporations tend to view taxes as a reduction in earnings and therefore seek ways to reduce the burden, one of which is through tax aggressiveness. Although still within the boundaries of tax regulations, such practices diminish potential state revenue and remain a concern for policymakers. This research explores the influence of capital intensity, sales growth, and inventory intensity on corporate tax aggressiveness. The study focuses on firms in the food and beverage sub-sector listed on the Indonesia Stock Exchange between 2019 and 2023. The sample was determined using purposive sampling in line with predetermined criteria, while panel data regression was employed for hypothesis testing. The findings reveal that capital intensity, sales growth, and inventory intensity jointly exert a significant impact on tax aggressiveness. Moreover, partial analysis confirms that each variable individually contributes to explaining variations in tax aggressiveness. These results underscore the importance of firm-level financial policies in shaping corporate tax behavior.

Keywords: *Tax Aggressiveness; Capital Intensity; Sales Growth; Inventory Intensity*

1. INTRODUCTION

Tax revenue is the main source of government income, financing both routine expenditures and national development programs such as infrastructure, education, and health. In Indonesia, the government continuously seeks to maximize tax revenue, as reflected in the enactment of the Harmonized Tax Law (UU HPP) in 2021, which reduced the corporate income tax rate from 25% to 22% starting in the 2022 fiscal year (DJP, 2021). However, there remains a fundamental conflict of interest between the government, which aims to optimize tax collection, and companies, which seek to minimize expenses to maximize profits (Nugraha & Meiranto, 2015).

For companies, taxes are considered a burden that reduces net income. This condition encourages firms to engage in tax management, either legally through tax avoidance or illegally through tax evasion (Pratiwi, 2018). One of the common forms of legal tax management is tax aggressiveness, which refers to aggressive tax planning to reduce tax liabilities (Savitri & Rahmawati, 2017; Chen et al., 2010). While legally permissible, tax aggressiveness is undesirable for the government because it decreases potential tax revenue (Pohan, 2016).

Several factors may influence corporate tax aggressiveness. Prior

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studies suggest that capital intensity, defined as the proportion of investment in fixed assets, may affect tax aggressiveness due to depreciation expenses that reduce taxable income (Muzakki & Darsono, 2015; Ayem & Setyadi, 2019). However, empirical findings remain inconsistent, with some studies reporting significant effects (Nugraha & Meiranto, 2015; Hidayat & Fitria, 2018) while others found no relationship (Adisamartha & Noviari, 2015; Indradi, 2018). Similar inconsistencies appear in studies on sales growth and inventory intensity, with some showing positive, negative, or insignificant effects on tax aggressiveness (Ramadhani et al., 2020; Ningsih & Noviari, 2022; Yuliana & Wahyudi, 2018).

Given these mixed findings, this study investigates the effect of capital intensity, sales growth, and inventory intensity on tax aggressiveness. The research focuses on food and beverage companies listed on the Indonesia Stock Exchange during 2019–2023, as this sector plays an essential role in economic stability and receives significant public attention. The central research question is whether capital intensity, sales growth, and inventory intensity significantly influence corporate tax aggressiveness in this industry.

2. LITERATURE REVIEW

Agency Theory

Agency theory describes the contractual relationship in which one or more principals engage an agent to perform tasks on their behalf, including decision-making authority (Jensen & Meckling, 1976). Both parties are assumed to maximize their own interests, which often leads to conflicting objectives (Godfrey et al., 2010). This misalignment generates agency costs and potential agency problems (Eisenhardt, 1989).

In the taxation context, agency problems occur between the government (tax authorities) and companies (management). While tax authorities aim to maximize state revenue, companies seek to minimize tax expenses to increase profit. This conflict motivates firms to adopt tax strategies, including tax aggressiveness, to reduce tax liabilities (Amalia, 2021).

Tax Aggressiveness

Tax aggressiveness refers to corporate actions intended to reduce taxable income through tax planning, either legally via tax avoidance or illegally through tax evasion (Hidayat & Fitria, 2018). This practice, although common, attracts public concern because it reduces government revenue (Leksono et al., 2019). The Effective Tax Rate (ETR) is the most widely applied proxy to measure tax aggressiveness. A lower ETR indicates that firms pay less income tax relative to pre-tax income, reflecting higher levels of tax aggressiveness (Nilasari, 2018).

Capital Intensity

Capital intensity represents the extent of corporate investment in fixed assets. It is commonly measured by the ratio of fixed assets to sales (Kasmir, 2014). A higher level of capital intensity typically results in larger depreciation expenses, which reduce taxable income and lower corporate tax obligations (Dharma & Noviari, 2017). Prior studies show mixed findings: some report a significant relationship with tax aggressiveness (Andhari & Sukartha, 2017; Hidayat & Fitria, 2018; Ayem & Setyadi, 2019), while others suggest an insignificant effect.

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Sales Growth

Sales growth reflects a company's ability to increase revenue over time and indicates its profitability prospects (Deitiana, 2011; Andriyanto, 2015 in Islami et al., 2021). Higher sales growth often leads to higher profits, which in turn increase tax obligations. Consequently, firms with rapid sales growth may engage in tax aggressiveness to mitigate higher tax burdens (Riswandari & Bagaskara, 2020; Wahid, 2021; Ramadhani et al., 2020). However, empirical results remain inconsistent across studies.

Inventory Intensity

Inventory intensity measures the proportion of inventory relative to total assets. For manufacturing and trading firms, inventory is crucial as it directly supports revenue generation (PSAK 14). Large inventories incur storage and maintenance costs, which may reduce taxable profit and tax liabilities (Anindyka et al., 2018). Prior research suggests inventory intensity can influence tax aggressiveness, though findings vary (Saputro et al., 2018; Yuliana & Wahyudi, 2018; Maulana, 2020).

Capital Intensity and Tax Aggressiveness

Firms with substantial fixed asset investment face significant depreciation expenses. These expenses lower taxable income and consequently reduce tax payments. Therefore, managers may deliberately allocate idle funds to fixed assets as a means of tax reduction (Dharma & Noviari, 2017). Prior research indicates that capital intensity positively affects tax aggressiveness (Andhari & Sukartha, 2017; Hidayat & Fitria, 2018).

H1: Capital intensity has an effect on tax aggressiveness.

Sales Growth and Tax Aggressiveness

Companies experiencing high sales growth generally report higher profits. To reduce the tax burden associated with this profit increase, management may adopt aggressive tax strategies. Empirical studies confirm that sales growth influences tax aggressiveness (Riswandari & Bagaskara, 2020; Wahid, 2021).

H2: Sales growth has an effect on tax aggressiveness.

Inventory Intensity and Tax Aggressiveness

Higher inventory levels increase storage and maintenance costs, reducing accounting profit and taxable income. This condition may drive companies to adopt aggressive tax strategies. Previous studies also support this relationship (Saputro et al., 2018; Nurlaela & Chomsatu, 2018).

H3: Inventory intensity has an effect on tax aggressiveness.

Simultaneous Effects of Capital Intensity, Sales Growth, and Inventory Intensity

Individually, each factor may influence tax aggressiveness; collectively, they may interact to explain corporate tax behavior. Thus, the combined effects are also tested.

H4: Capital intensity, sales growth, and inventory intensity simultaneously affect tax aggressiveness.

3. RESEARCH METHOD

3.1. Data Collection Techniques

The study utilized secondary data drawn from the official portal of the

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Indonesia Stock Exchange (www.idx.co.id) as well as the individual websites of the sampled companies. The dataset covers audited annual reports of food and beverage firms listed between 2019 and 2023. Using these official publications strengthens the credibility of the research, since the information reflects verified disclosures released to the public..

3.2. Operational Definitions of Variables

The dependent variable in this study is Tax Aggressiveness (Y), measured using the Effective Tax Rate (ETR) with the formula:

$$\text{ETR} = \frac{Tax\ Expense\ i,\ t}{Pretax\ Income\ i,\ t}$$

The first independent variable is Capital Intensity (X1), measured as the ratio of net fixed assets to total assets:

$$Capital\ Intensity = \frac{\text{Net Fixed Assets}}{\text{Total Asset}}$$

(Dharma & Noviari, 2017).

The second independent variable is Sales Growth (X2), measured by the percentage change in sales from the previous year:

$$Growth\ = \frac{Sales_t - Sales_{t-1}}{Sales_{t-1}}$$

(Islami et al., 2021)

The third independent variable is Inventory Intensity (X3), measured as the ratio of total inventory to total assets

$$Inventory\ Intensity = \frac{\text{Total Inventory}}{\text{Total Aset}}$$

(Anindyka et al., 2018).

3.3. Sample Collection Techniques

The research population consists of all consumer goods manufacturing companies listed on the Indonesia Stock Exchange (IDX) within the 2019–2022 observation period, amounting to 61 entities. From this population, the sample was chosen through purposive sampling, applying predetermined criteria to ensure data relevance for analysis. The consumer goods sector was deliberately selected given its stable performance and important contribution to economic and social development. The sampling design followed a non-probability approach, specifically judgment sampling, where firms were included based on defined considerations (Sekaran, 2017). The sample selection criteria were:

1. Companies classified in the food and beverage sector listed on the IDX during 2019–2023.
2. Companies with complete financial data throughout the observation period.
3. Companies presenting financial reports in Indonesian Rupiah.
4. Companies that fulfill the statistical requirements of panel data analysis.

Based on these criteria, 21 companies met the requirements and were selected as the research sample, resulting in a total of 105 firm-year observations (21 firms × 5 years). This sample size is considered adequate to provide robust empirical evidence while maintaining data relevance to the research objectives

3.4. Data Analysis Techniques

The study employed panel data regression, which integrates both time-series and cross-sectional dimensions to enhance the robustness of the analysis (Ghozali & Ratmono, 2017). Compared to relying solely on cross-sectional or time-series data, this approach provides broader insights, mitigates potential multicollinearity issues, and increases the degrees of freedom.
To determine the most suitable estimation model, several specification

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tests were applied, including the Chow Test, Hausman Test, and Lagrange Multiplier Test. In addition, classical assumption diagnostics such as tests for normality, multicollinearity, heteroscedasticity, and autocorrelation were conducted to ensure the reliability of the regression model. Hypotheses were then evaluated using the F-test for joint significance, the t-test for individual significance, and the coefficient of determination (R^2) to assess explanatory strength.

4. RESULTS AND DISCUSSION

4.1. Results

Model Specification Tests

This study employed panel data regression. To determine the most appropriate estimation model, three specification tests were conducted: the Chow Test, the Hausman Test, and the Lagrange Multiplier (LM) Test.

Table 1 : Summary of Model Specification Tests

Test	Models Compared	Selected Model
Chow Test	CEM dan FEM	FEM
Hausman Test	FEM dan REM	FEM
Lagrange Multiplier	REM dan CEM	CEM

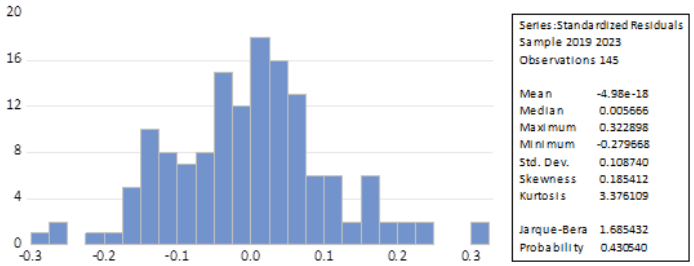
Based on these results, the Fixed Effect Model (FEM) is considered the most appropriate specification for hypothesis testing in this study.

Classical Assumption Tests

To verify the robustness of the regression model, a series of diagnostic procedures were carried out, including assessments for normality, multicollinearity, heteroskedasticity, and autocorrelation.

1. Normality Test

The Jarque-Bera (JB) test was applied to examine the distribution of residuals. The probability value of 0.4305 > 0.05 indicates that the residuals are normally distributed.



Picture 1: Normality Test

2. Multicollinearity Test

Multicollinearity was tested using correlation coefficients among the independent variables. As all correlation values were below 0.90, no multicollinearity issue was detected.

Table 2 : Multicollinearity Test

	LOG(X1)	X2	LOG(X3)
LOG(X1)	1.000000	0.113215	-0.343807
X2	0.113215	1.000000	-0.084486
LOG(X3)	-0.343807	-0.084486	1.000000

3. Heteroskedasticity Test

The Breusch-Pagan-Godfrey test was employed to check variance consistency. The probability value of Obs*R-squared (0.2704 > 0.05) confirms the absence of heteroskedasticity.

Table 3: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey Null hypothesis: Homoskedasticity			
F-statistic	1.305306	Prob. F(3,141)	0.2752
Obs*R-squared	3.918190	Prob. Chi-Square(3)	0.2704
Scaled explained SS	14.35864	Prob. Chi-Square(3)	0.0025

4. Autocorrelation Test

The Breusch-Godfrey LM test was used to identify serial correlation. With a probability value of 0.2740 >

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0.05, the results indicate no autocorrelation in the model.

Table 4: Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	1.263513	Prob. F(2,139)	0.2859
Obs*R-squared	2.589038	Prob. Chi-Square(2)	0.2740

Hypothesis Testing

Hypothesis testing in this study was conducted through three stages: coefficient of determination, simultaneous significance (F-test), and partial significance (t-test).

Coefficient of Determination (R^2)

The coefficient of determination measures the explanatory power of independent variables on the dependent variable.

Table 5 Coefficient of Determination (R^2)

Root MSE	0.108365	R-squared	0.523596
Mean dependent var	0.767610	Adjusted R-squared	0.392901
S.D. dependent var	0.611454	S.E. of regression	0.122753
Sum squared resid	1.702719	F-statistic	4.006239
Durbin-Watson stat	2.079402	Prob(F-statistic)	0.000000

The Adjusted R^2 value of 0.3929 indicates that capital intensity, sales growth, and inventory intensity explain 39.2% of the variation in tax aggressiveness, while the remaining 60.8% is explained by other factors not included in the model.

Simultaneous Significance Test (F-test)

The F-test evaluates the joint effect of all independent variables. The probability of F-statistic is 0.000 < 0.05, meaning capital intensity, sales growth, and inventory intensity simultaneously influence tax aggressiveness.

Table 6 Coefficient of Determination (R^2)

Root MSE	0.108365	R-squared	0.523596
Mean dependent var	0.767610	Adjusted R-squared	0.392901
S.D. dependent var	0.611454	S.E. of regression	0.122753
Sum squared resid	1.702719	F-statistic	4.006239
Durbin-Watson stat	2.079402	Prob(F-statistic)	0.000000

Partial Significance Test (t-test)

The t-test examines the effect of each independent variable individually.

Table 7: Partial Significance Test (t-test)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.250479	0.038690	6.474026	0.0000
LOG(X1)	0.063116	0.017170	3.675991	0.0004
X2	-0.053527	0.018565	-2.883323	0.0047
LOG(X3)	-0.042789	0.016413	-2.606985	0.0104

The results confirm that:

1. **Capital Intensity (X1)** has a significant positive effect on tax aggressiveness, supporting H1.
2. **Sales Growth (X2)** has a significant negative effect on tax aggressiveness, supporting H2.
3. **Inventory Intensity (X3)** has a significant negative effect on tax aggressiveness, supporting H3.

Thus, all proposed hypotheses are empirically supported by the model.

4.2 Discussion

The Effect of Capital Intensity, Sales Growth, and Inventory Intensity on Tax Aggressiveness

The results indicate that the probability value of the F-statistic is 0.000 < 0.05, confirming that capital intensity, sales growth, and inventory intensity simultaneously affect tax aggressiveness. One factor contributing to tax aggressiveness is capital intensity. Companies with substantial fixed assets tend to increase tax avoidance practices, as depreciation expenses can be used to reduce taxable income. Another factor is sales growth. An increase in sales growth typically leads to higher profits, which in turn increases the corporate tax burden and may encourage firms to engage in tax

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avoidance. The third factor is inventory intensity. Higher inventory levels are associated with additional storage and maintenance costs, which reduce company profits. Lower profits, in turn, motivate companies to become more aggressive in minimizing their tax obligations.

The Effect of Capital Intensity on Tax Aggressiveness

Partial testing shows that capital intensity significantly influences tax aggressiveness (t-statistic = 3.675991; sig. 0.0004 < 0.05). This finding contradicts Indradi (2018) and Mustika et al. (2017), but aligns with Nugraha and Meiranto (2015), Andhari and Sukartha (2017), Hidayat and Fitria (2018), and Ayem and Setyadi (2019). Capital intensity reflects the extent to which firms invest in fixed assets, which generate higher depreciation expenses. These expenses reduce taxable income, thereby decreasing the company's tax liability (Andhari & Sukartha, 2017). Managers may deliberately allocate idle funds into fixed assets to utilize depreciation as a tax shield (Dharma & Noviari, 2017).

The Effect of Sales Growth on Tax Aggressiveness

The partial test reveals that sales growth significantly affects tax aggressiveness (t-statistic = -2.883323; sig. 0.0047 < 0.05). Companies with high growth generate larger profits, which often motivates management to adopt tax avoidance strategies to reduce tax obligations (Ramadhani et al., 2020). However, in this study, sales growth shows a negative relationship with tax aggressiveness, suggesting that higher sales growth reduces the tendency of firms to engage in tax avoidance. This finding contrasts with Ningsih & Noviari (2022) and Ramadhani et al. (2020), but is consistent with Antari & Merkusiwati (2022), who also documented a significant negative effect of sales growth on tax aggressiveness.

The Effect of Inventory Intensity on Tax Aggressiveness

The partial test further indicates that inventory intensity significantly influences tax aggressiveness (t-statistic = -2.606985; sig. 0.0104 < 0.05). This finding supports Yuliana & Wahyudi (2018), who argued that inventory intensity is associated with tax aggressiveness. High inventory levels create additional storage and maintenance costs, which reduce profitability. Lower profits may encourage firms to adopt aggressive tax strategies to minimize their tax burden. Conversely, this result contradicts Savitri and Rahmawati (2017), who found no significant relationship between inventory intensity and tax aggressiveness.

5. CONCLUSION

This study provides empirical evidence that capital intensity, sales growth, and inventory intensity jointly influence tax aggressiveness. More specifically, capital intensity, sales growth, and inventory intensity each demonstrate a significant effect on the level of corporate tax aggressiveness. These findings highlight the importance of operational and financial structures in shaping corporate tax behavior, suggesting that firms strategically utilize investment in fixed assets, sales performance, and inventory management as mechanisms for tax planning.

From a practical perspective, the results imply that investors should be aware that corporate tax aggressiveness is influenced by key operational indicators, including the level of capital and inventory management. For companies, the findings underline the importance of maintaining transparency in tax reporting

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and avoiding excessive reliance on aggressive tax strategies, even under financial pressure. From an academic standpoint, this study contributes to the body of knowledge on tax aggressiveness, although certain inconsistencies with prior research suggest that the topic remains open for further exploration.

Future research is encouraged to examine other industries such as property, real estate, logistics, and manufacturing to assess whether sectoral differences affect the relationship between these variables and tax aggressiveness. Extending the observation period and incorporating additional variables such as corporate governance, earnings management, or financial distress could also provide deeper insights and enrich the understanding of tax aggressiveness determinants.

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