

Original Article

Exploring How Firm Scale, Longevity, Profit Margins, Loss Carryforwards, and Debt Levels Influence Tax Avoidance on Industrial Enterprises

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Abstract: This research explores the determinants of tax avoidance practices from Indonesian industrial enterprises, a topic of increasing global relevance, given the ongoing efforts to enhance tax transparency and compliance. This research examines the influence of firm scale, longevity, profit margins, loss carryforwards, and debt levels on tax avoidance practices. Using a purposive sample of 46 industrial enterprises included in the IDX listings over the timeframe of 2021 to 2023, analyzed via multiple linear regression, we find that longevity, profit margins, and loss carryforwards significantly affect tax avoidance practices, contrarily firm scale and debt level do not exhibit a meaningful relationship. The results indicate that firm-specific characteristics are central to shaping tax behavior. This research enhances academic discourse by supplying empirical evidence rooted in the dynamics of an emerging market, highlighting the imperative to reflect on firm-specific drivers behind the understanding of tax avoidance strategies. The outcomes of this research suggest important considerations for industrial enterprises seeking to optimize their tax strategies, regulators aiming to enhance tax compliance, and investors evaluating corporate financial performance.

Keywords: Firm Scale, Longevity, Profit Margins, Loss Carryforwards, Debt Levels, Tax Avoidance, Industrial Enterprises.

I. INTRODUCTION

Government funding fundamentally relies on tax revenues, but corporations often see them as a burden because they reduce profitability. Conflicts of interest between the government (which wants stable tax revenues) and corporations (which seek to minimize the tax burden) are inevitable. Economic instability that affects a company's performance is often not tolerated by the tax authorities, which emphasize consistent income [1]. Tax collection is not easy. Taxes can affect the company's business continuity [2]. In developing countries, taxes are essential to support the country's budget, thus attracting a lot of attention to the sector. However, efforts to optimize tax revenue are not without challenges. Among the key hurdles faced is the issue of tax avoidance, which entities often do to reduce their tax liability [3].

Tax avoidance is generally considered an unacceptable practice that should be prevented. However, tax avoidance often takes advantage of legal loopholes, so it is not technically against the law. In Indonesia, many companies, including large multinationals with significant assets, are involved in tax evasion [4]. In 2005, about 750 foreign companies were allegedly involved in this practice [5] by reporting losses for five consecutive years to avoid paying taxes. Tax avoidance is attractive because it reduces tax obligations while operating under the framework of tax laws by exploiting exemptions or strategically deferring payments [5]. This becomes a complex issue because tax avoidance is still seen as undesirable even if it is allowed. This research uses the tax charge expressed by cash disbursements to quantify tax avoidance behavior.

Various linked factors contribute to the dynamics of tax avoidance, including firm scale, longevity, profit margins, loss carryforwards, and debt levels. Firm scale is in the spotlight because larger companies tend to pay more attention to the government, thus influencing how managers manage their tax obligations [3]. The company's longevity reflects its experience surviving and competing in the market [6]. Profit margins, commonly evaluated through the Return On Assets (ROA) metric, are directly related to a company's net profit and income taxes. Loss carryforwards allows companies to shift losses from one period to the next, reducing the tax burden [3]. Additionally, debt financing influences tax avoidance strategies because the interest expenses incurred can diminish the amount of taxable profit [7].

The present research seeks to evaluate how firm scale, longevity, profit margins, loss carryforwards, and debt levels on tax avoidance practices in Industrial enterprises publicly traded on the IDX throughout the 2021 to 2023 timeframe. This research is designed to contribute meaningful understanding to companies, regulators, and shareholders regarding tax avoidance.



II. LITERATURE REVIEW

A) Prior Research

Prior research has identified Various influences on the tax avoidance tactics employed by businesses.

- *Financial Factors and Corporate Governance*: Kurniasih & Sari (2013) found that ROA, governance frameworks, firm scale, and loss carryforwards simultaneously affected tax avoidance. This research underscores the significance of financial performance and oversight frameworks in shaping corporate tax strategies [3]. Research by Chytis et al. (2016) found that company characteristics such as firm scale, debt levels, profit margins, and governance frameworks emphasise board independence. There exists a notable association between audit quality with tax avoidance behavior. The research outcomes demonstrate that substantial companies often engage less in tax avoidance behavior, while enterprises with elevated returns on capital are prone to adopting tax avoidance behaviors. In addition, good corporate governance, including high-quality audits, can reduce tax avoidance activities [8].
- *Company Characteristics*: Dewinta & Setiawan (2016) analyzed how firm scale, longevity, profit margins, debt levels, and sale growth as determinants of tax avoidance. Evidence from their research points to firm scale, longevity, profit margins, and revenue stream escalation have strong and uplifting contributions to tax avoidance practices, while debt levels have a strong and negative effect [8]. Hermanto & Dewinta (2023) also revealed that the firm's scale, efficiency, and growth had no discernible impact on profit margins. Conversely, profit margins are significantly shaped by liquidity, debt levels, and market strength [10].
- *Executive Characteristics*: Swingly & Sukartha (2015) explore how executive attributes, firm scale, debt levels, financial governance committee, and escalation of revenue streams affect outcomes on tax avoidance behavior. According to their research, executive attributes and firm scale promote tax avoidance, but debt levels appear to have an inverse effect. On the other hand, sales growth and audit committees were not found to have significant influence [9].

B) Theories

a. Agency Relationship Models

The agency relationship paradigm defines the roles and interactions between managers as agents and shareholders as principals, in which the manager is delegated the authority to make decisions on behalf of the shareholder [12]. Information asymmetry can arise because company executives are better informed about the organization's prospects than shareholders [13]. In the context of taxation, conflicts can arise between the tax authorities (which seek to maximize revenue) and the company's management (which seeks to minimize the tax burden) [14].

Further, company size can also influence tax avoidance practices, where larger companies tend to have greater resources to conduct complex tax planning [15]. In addition, executive characteristics also serve as key factors in shaping tax-related choices, as executive preferences and management styles might modify the scale of tax aggressiveness of the company [5].

b. Financial Position Reports

Financial position reports are crucial for conveying financial health to stakeholders [13]. Present a comprehensive view of a company's earnings, fiscal stability, and cash flow dynamics [16] [17]. Shareholders use financial position reports to make investment decisions [18].

Financial position reports also serve as a critical basis for tax-related analyses, including detecting potential tax avoidance practices. Financial position reports provide essential data for identifying discrepancies between reported earnings and taxable income, which may indicate aggressive tax planning [19]. Additionally, transparency of financial reporting can either constrain or reveal tax avoidance strategies, depending on the quality of disclosure [20]. Stakeholders, including tax authorities, rely on financial position reports to examine a firm's conformity with established tax rules and requirements. In the context of your study, analyzing financial position reports (e.g., profit margins and debt levels) could uncover patterns linking corporate characteristics to tax avoidance behaviors in Indonesian industrial enterprises [19].

c. Capital Markets

The capital market facilitates the transfer of funds between entities with abundant financial reserves and counterparts searching for capital [19] [22]. The capital market allows companies to raise capital by issuing shares and bonds. Financial statements are critical in this process, providing essential information for investors and stakeholders. High-quality financial reporting enhances investor confidence in the capital market, which is crucial for attracting investment [23]. Transparent financial statements enable investors to make informed decisions, fostering a more efficient market environment [24]. Additionally, timely and accurate financial reporting is vital for examining the enterprise's performance and financial health, directly impacting investment strategies in the capital market [25].

d. Tax

Taxes represent compulsory payments made to the government, serving as the primary source of monetary support for government-provided services and infrastructure [26]. The government tax receipts system is classified as an official tax determination system, taxpayer self-reporting framework, or pre-collection withholding method [27]. Resistance to taxes can be passive (reluctance to pay) or active (attempts to avoid or evade taxes) [26]. Tax avoidance involves using legitimate means to minimize tax liability [28] [29] [30]. The OECD fiscal committee identified three main characteristics of tax avoidance: artificial arrangements, exploitation of loopholes, and secrecy [31]. Research shows that the quality of financial statements affects tax avoidance, where companies with aggressive financial statements tend to commit higher tax avoidance [32].

Factors Affecting Tax Avoidance

- 1) *Firm Scale*: The firm's scale is key in guiding tax-related strategies. Prominent firms may be more cautious in managing their tax obligations due to increased oversight [3]. The scale of an enterprise can be expressed by the logarithmic value of its overall asset base [33] [34].
- 2) *Longevity*: The company's longevity reflects its experience and reputation [24]. Older companies may have more sophisticated strategies for managing their tax obligations [35].
- 3) *Profit Margins*: A company's profit margins, often captured by ROA, measure its capacity to derive financial gains from the assets it controls [36]. Profit margins can affect an enterprise's motivation to avoid tax [3].
- 4) *Loss Carryforwards*: Loss Carryforwards allows companies to shift losses from one period to the next, reducing the tax burden [37] [3].
- 5) *Debt Levels*: Debt levels quantified by the DER demonstrate the extent of a company's utilization of debt in asset financing [38] [16]. Debt levels can affect a company's tax strategy because interest expense can reduce taxable profits [7].

C) Framework & Hypothesis Development

The conceptual framework is intended as a concept to explain, express, and examine the understanding of the association among the variables being studied rooted in identifying the issue; the relationship between the studied variables is described based on the above theoretical study.

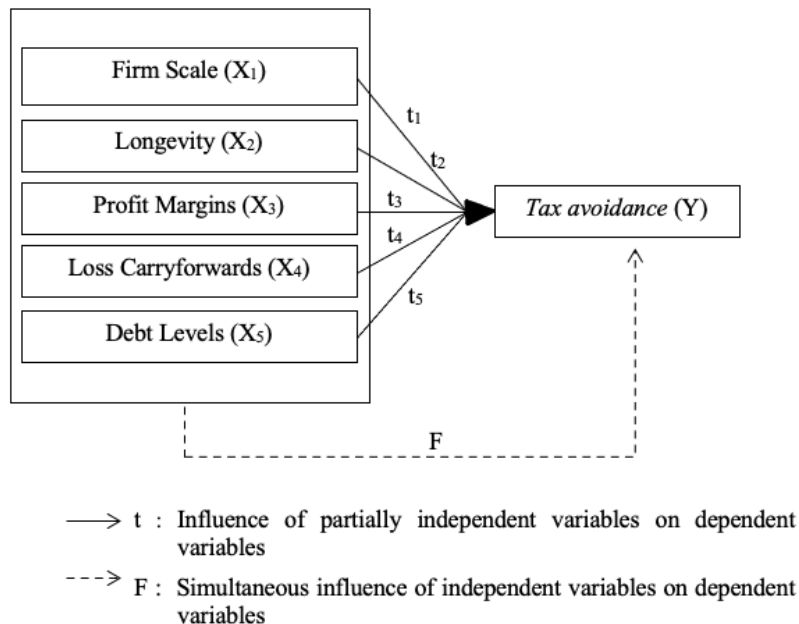


Fig. 1 Framework

a. Firm Scale and Tax Avoidance

Larger firms with greater resources tend to achieve profits with less volatility [39]. This stable profit can encourage companies to avoid tax avoidance because higher profits mean higher tax burdens. In contrast, smaller companies may not have the expertise or resources to optimally manage their tax burden [40]. Based on the agency relationship models, managerial personnel can adopt corporate resources to lower the organization's tax expenses and maximize performance [12]. In line with this thinking, prior research has identified a firm's scale is positively aligned with its strategic efforts to reduce

tax burdens [7] [11] [40] [41] [42] [43]. Therefore, we set forth the hypothesis detailed below: **(H1)** Firm scale has a positive association with tax avoidance practices.

b. Longevity and Tax Avoidance

Over time, companies can become more inefficient [44]. Experience and learning gained over time can encourage companies to reduce costs, including tax costs. An older firm may possess improved tax management capabilities derived from previous encounters. Dewinta & Setiawan (2016) found that the duration of a company's existence contributes positively to its tax avoidance behavior [8]. Thus, we hypothesize that **(H2)** Longevity positively affects tax avoidance practices.

c. Profit Margins and Tax Avoidance

ROA often quantifies profit margins to demonstrate a firm's efficiency in producing earnings from its total assets [45]. ROA quantifies the proficiency with which a business employs its resources to achieve profit margins [46]. Elevated ROA values indicate greater profitability for the firm [25]. Kurniasih & Sari (2013) found that the level of ROA significantly impacts the extent of tax avoidance undertaken by firms. Highly profitable firms may prefer in-house funding and have a compelling reason to adjust asset management practices to decrease tax burdens [3]. So, we hypothesize: **(H3)** Profit margins positively affect tax avoidance.

d. Loss Carryforwards and Tax Avoidance

Firms experiencing financial losses during a fiscal year are granted tax relief, allowing them to offset these losses against profits in the subsequent five years, effectively lowering their overall tax liability [14]. Sriyono & Andesto (2022) found that companies with smaller compensation for fiscal losses tended to have higher GAAP ETR values [47]. Based on this, we Hypothesize: **(H4)** Loss carryforwards has a negative association with tax avoidance.

e. Debt Levels and Tax Avoidance

Firms often use debt levels borrowing to finance their day-to-day operations and capital investments. However, debt carries a predetermined cost in the form of interest payments. An increase in debt levels tends to reduce taxable income as a result of tax benefits associated with interest expenses [3]. Firms that experience extensive tax liabilities may choose to go into debt to reduce taxes. Richardson & Lanis (2007) found that an upward in the firm's debt level is associated with a decrease in its GAAP effective tax rate [48]. Thus, we hypothesize that **(H5)** Debt levels positively affect tax avoidance.

III. METHOD

This research adopts a cause-and-effect framework to examine the relationship between research variables. Specifically, we analyzed how firm scale, longevity, profit margins, loss carryforwards, and debt levels influence tax avoidance practices. Causal design allows us to measure how changes in independent variables affect dependent variables [49].

The subjects encompassed within this research consist of industrial enterprises included in the IDX listings over the timeframe of 2021 to 2023. The manufacturing industry was chosen because of its broad scope, involves significant capital including intellectual capital, and relies on human capital as a priority in production [50].

Purposive sampling was applied, entailing the selection of samples guided by specific attributes that correspond to the research's intent. The sample selection criteria include:

- Enterprises consistently issued their annual reports during the years 2021 through 2023.
- The enterprise's report provides data on employee count over the specified period.
- The enterprise did not suffer losses for two consecutive years in the 2021-2023.
- It has criteria related to the variables integrated into the research design.

This research utilizes documentary sources as its primary data type, namely the financial position reports of industrial enterprises included in the IDX listings over the timeframe of 2021 to 2023. The dataset was sourced directly and accessed via the official website www.idx.co.id or the respective enterprise's sites.

- a) Dependent Variable: Tax Avoidance. The Cash Effective Tax Rate (CETR) is the key measurement criterion to capture tax avoidance behavior. CETR measures cash tax payments relative to earnings before taxes [51].
- b) Independent Variables: Firm Scale, Longevity, Profit Margins, Loss Carryforwards, Debt Levels. The scale of an enterprise is determined by expressing the full asset base in terms of its natural logarithm. Total asset logs are considered more stable and sustainable than other-size proxies [52]. The longevity of an enterprise is measured as the years of existence from the time the enterprise was founded to the end of the research period (2023). Longevity reflects the enterprise's experience and potential to maintain a competitive edge [6]. Profit margins are measured using ROA. This ratio indicates the extent to which an enterprise can generate income relative to the total assets it controls [36]. Loss

carryforwards is assessed through the application of binary indicator variables. This variable is given the numerical assignment of 1 if the enterprise has loss carryforwards at the start of the annual cycle [53]. Debt levels are measured using DER. This ratio indicates the balance between a firm's debt obligations and equity capital in funding its activities [16].

Data is collected through documentation observation by sourcing data from financial position reports made available to the public by the sample enterprise through IDX. Furthermore, analytical procedures were applied to the dataset utilizing a multiple regression approach to analyze the relationship between independent variables and their corresponding dependent variables. Regression analysis quantifies both the magnitude and the trajectory of the association among these variables and tests the hypothesis that has been formulated.

- a) Descriptive Statistics: An overview of the data will be offered by applying descriptive statistical methods with no purpose to test hypotheses [54]. These statistics play a role in discerning and describing the properties of the research subset and the defining characteristics applied during this analytical process.
- b) Classical Assumption Test: Before performing regression analysis, a sequence of classical assumption evaluations will be performed to ensure that the regression model is qualified to provide valid and reliable results. This test includes:
 - 1) *Normality Test*: in order to analyze the data for adherence to normality assumptions, the Kolmogorov-Smirnov test will be applied. The hypothesis tested is whether the sampled data's spread corresponds to the population's normal distribution [55].
 - 2) *Autocorrelation Test*: Autocorrelation in the data will be investigated by utilizing the Durbin-Watson test procedure. Durbin-Watson values between 1.5 and 2.5 generally indicate no significant autocorrelation [56].
 - 3) *Multicollinearity Test*: A strong association between predictor factors leads to multivariate collinearity, which can be assessed through tolerance and Variance Inflation Factor (VIF) metrics. A VIF score below 10 generally indicates significant multicollinearity [56].
 - 4) *Heteroscedasticity Test*: An examination of heteroscedasticity will be conducted to assess whether a residual variance is consistent across observations. A scatter plot graph between the predicted and residual values will be used to detect heteroscedasticity patterns [51].
- c) MLR Analysis: To determine how firm scale (X1), longevity (X2), profit margins (X3), loss carryforwards (X4), and debt levels (X5) affect tax avoidance (Y). The analytical approach utilizes the following regression formula: Y is modeled as α plus the sum of β coefficients multiplied by their respective variables X1 through X5, along with the residual error ϵ [52].
- d) Hypothesis Testing:
 - 1) *T-test (partial)*: The noteworthy influence of the relationship dynamics between every independent element and the dependent construct will be tested by applying the t-test. The default proposition (H_0) is no evidence that suggests that the independent variables contribute to variations in tax avoidance, while the alternative hypothesis (H_a) is that independent variables exert a notable influence on tax avoidance behavior [56].
 - 2) *F Test (simultaneous)*: An F test will be applied to evaluate the presence of the group of independent elements together significantly affects the dependent construct. The process of making decisions criterion compares the significance measure of F with the level of significance ($\alpha = 0,05$) [54].
 - 3) *R² Test(determination regression coefficient)*: R-squared (R^2) is employed to assess the percentage of diversity in the dependent construct explained by the set of independent elements. Adjusted R^2 will be used because the computational regression scheme has a combination of independent elements [49].

IV. OUTCOME AND INSIGHTS

A) Research Outcome

This research focuses on enterprises that play a fundamental part in Indonesia's economic structure, namely the manufacturing industry sector listed on IDX. This sector was chosen because of its breadth of scope and contribution to the country's economy, which involves large capital and human labor [50]. The analysis is based on financial position reports from industry enterprises covering The timeframe spanning the start of 2021 through the end of 2023.

From a total of 213 manufacturing industry enterprises listed on IDX, sample selection was conducted using inclusion criteria designed to ensure the quality and relevance of the data [49]. The criteria are specified as:

Table 1: Process of Participant Recruitment

No.	Judgment Factors	Sum
1.	Manufacturing industry enterprises listed on IDX	213
2.	Enterprises that omitted to publish their financial position reports for the period concluding on December 31 during the years 2021 to 2023	53

3.	Enterprises that suffer losses in their financial statements	91
4.	Enterprises that do not have research variable criteria	23
Number of industry enterprises used as research objects		46
Number of observations 46 enterprises x 3 years		138

Thus, the participants selected for this research included 46 manufacturing industry enterprises observed for 3 years (2021-2023), resulting in 138 observations. This careful selection of samples is expected to produce valid and reliable findings [50] and provide a relevant exploring the determinants that shape practices in Indonesia's manufacturing industry.

B) Statistical Descriptive Analysis

Statistical descriptive analysis delivered an in-depth summary of the dataset employed in this research [54]. This method can better understand the main characteristics of variables such as Cash Effective Tax Rate (CETR), firm scale, longevity, ROA, loss carryforwards, and debt levels. This analysis includes calculating and interpreting the sample size, minimum and maximum thresholds, mean values, and the statistical spread metric corresponding to each variable analyzed.

Table 2: Statistical Summaries							
		CETR	Firm Scale	Longevity	ROA	Losses Carryforwards	Debt Levels
N	Valid	138	138	138	138	138	138
	Missing	0	0	0	0	0	0
Mean		-.1250	9.9962	37.9783	24.8251	1.5000	19.2306
Std. Deviation		1.32341E1	2.41857	16.43544	1.99251E2	.50182	58.40704
Minimum		-79.35	5.00	17.00	-18.45	1.00	.01
Maximum		53.63	13.37	84.00	2345.43	2.00	436.47

Descriptive Statistical Interpretation:

- Cash Effective Tax Rate (CETR): Among the 138 collected samples, CETR measurements fluctuate, extending from the lowest point of -79.35 to the highest point of 53.63. The CETR's mean value is found to be -0.1250, which indicates a decrease in the effective tax payment by the sample company each year. The high standard deviation (13.2341) indicates a significant variation in CETR levels between enterprises.
- Firm Scale: Firms scale exhibits values spanning from 5.00 at the lowest end to 13.37 at the highest, averaging 9.9962 with a data spread of 2.41857. Since the indication of data spread falls below the mean, it indicates that the firm scales are relatively consistent in the sample has a relatively small or homogeneous spread. Previous research has also found that company size affects tax avoidance [3] [43].
- Longevity: The enterprises participating in this research have been in operation for between 17 and 84 years, showing a mean value of 37.9783 years, accompanied by an indication of data spread of 16.4354. The spread of longevity data is relatively good because the extent of variation, represented by the indication of data spread, is less than the mean [6].
- Return on assets (ROA): The observed ROA spans from a negative minimum of -18.45 to an unusually large maximum of 2345.43. The average ROA value is 24.8251, with variability expressed through a standard deviation of 199.251. Despite the extreme valuest sample demonstrating a favorable ROA, as evidenced by the data spread being lower than the mean [36].
- Loss Carryforwards: With values spanning from 1.00 to 2.00, the loss carryforwards variable has an average of 1.50 and an indication of data spread measured at 0.50182. The distribution of fiscal loss compensation data is relatively small because the indication of data spread registers less than the mean value.
- Debt Levels: The DER metric exhibits a minimum value of 0.01, while its maximum reaches an extraordinary 436.47. The mean DER stands at 19.2306, with a standard deviation of 58.4070. A larger-than-mean standard deviation indicates that debt levels have a wide spread among the companies in the sample [38].

This descriptive analysis provides a robust base enabling further inferential examination, providing a conceptual basis for investigators to assess hypotheses and make reliable inferences about contributing variables influencing tax avoidance in Indonesia's manufacturing industry.

Classic Assumption Test

Before applying regression methods to explore relationships, prioritise validating that the data fulfills the classical conditions necessary for applying the linear regression model. The classical assumption evaluation involves examining normality, detecting autocorrelation, checking for multicollinearity, and assessing heteroscedasticity [54].

- 1) *Normality Test*: This analysis aimed to confirm the normality of the measured and influencing variables in the regression framework, using the Kolmogorov-Smirnov test as the chosen method. Based on the insights gained from the test procedures, the significance values for all variables (CETR, Firm Scale, Longevity, ROA, Loss Carryforwards, and DER) were above 0.05. This outcome indicates the conformity of the data to a normal distribution model and meets the necessary normality assumptions [55].

Table 3: Normality Test Results

Variable	Asymp. Sig. (2-tailed)
Cash Effective Tax Rate (CETR)	0,945
Firm Scale	1,117
Longevity	0,909
Return on Assets (ROA)	1,088
Loss Carryforwards	0,061
Debt Levels	0,089

- 2) *Autocorrelation Test*: This research aims to determine if a dependency exists between the error term at period t and the error term itself from the previous period (t-1) in the context of a linear regression analysis [54]. In order to test for autocorrelation, the Durbin-Watson method was applied, revealing a test statistic of 1.554. These values are outside ranges of 2 and 4, which indicates an autocorrelation in the model.

Table 4: Autocorrelation Test Results

Model	R	R ²	Adjusted R ²	Durbin-Watson
1	.119 ^a	.614	.642	1.554
b. Dependent Variable: CETR				

Despite the autocorrelation, these results need to be considered carefully because the Durbin-Watson test has limitations and ambiguous results [56].

- 3) *Multicollinearity test*: Performed to detect the presence of A strong interrelationship among predictor variables within a regression framework [56]. This study tested multicollinearity by assessing the magnitude of the variance inflation factor (VIF). The results of the multicollinearity test showed that the computed VIF summary statistics linked to each independent element were less than 4, which indicates no evidence of multicollinearity was detected within the model. [56].

Table 5: Multicollinearity Test Results

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Firm Scale	.944	1.060
	Longevity	.870	1.150
	ROA	.798	1.253
	Loss Carryforwards	.953	1.049
	Debt Levels	.907	1.102

- 4) *Heteroscedasticity Test*: Performed to determine whether the interfering factor (residual) variability is invariant across the range of observations. In this analysis, heteroscedasticity testing examined a scatterplot of predicted values (ZPRED) versus residuals (SRESID). The plot showed a random scatter of points without any systematic arrangement, demonstrating that the model remains unaffected by heteroscedasticity [7].

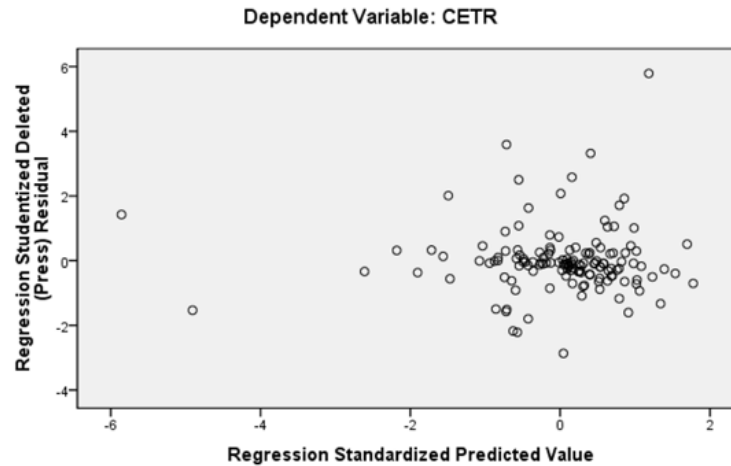


Fig. 2 Heteroscedasticity Diagnostic

Overall, conclusions drawn from the classical assumptions test illustrate that the regression model upholds most of the assumptions required for a valid analysis. Although there are indications of autocorrelation, this needs to be carefully considered in interpreting the data patterns revealed through regression.

Multiple Linear Regression Analysis

Once the fulfillment of classical assumptions has been confirmed (or at least carefully considered), the next step is to examine the proposed hypotheses through systematic multiple linear regression evaluation, aiming to quantify the impact of firm scale (X1), longevity (X2), ROA (X3), loss carryforwards (X4), and debt level (X5) on tax avoidance (Y). Table 6 presents a concise summary of the findings derived from the regression analysis.

Table 6: MLR Analysis Results

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	2.886	3.356
	Firm Scale	.125	.255
	Longevity	.029	.039
	ROA	.014	.070
	Loss Carryforwards	.276	1.225
	Debt Levels	-.027	.029
a. Dependent Variable: CETR			

As illustrated in Table 6, below are the multiple linear regression expressions derived from the data:

$$Y = 2.886 + 0.125X_1 + 0.029X_2 + 0.014X_3 + 0.276X_4 - 0.027X_5$$

Interpretation of Regression Coefficients:

- Constant: With a constant coefficient of 2.886, the model predicts a tax avoidance value of 2.886 when all explanatory variables are nullified.
- Firm Scale: The regression coefficient for the firm scale is 0.125. This indicates that every additional unit increase in the firm's scale is set to surge tax avoidance by 0.125 units, ceteris paribus. These results are aligned with prior research that found that larger enterprises often show better resources to manage their taxes [3] [42] [43].
- Longevity: The calculated slope coefficient representing the enterprise's lifespan is 0.029, demonstrating that every one-year growth in the enterprise's lifespan will increase tax avoidance by 0.029 units While keeping other variables fixed. Older companies may have more extensive experience managing their tax obligations [35].

- Profit Margins (ROA): The regression coefficient for ROA is 0.014. An increase of one unit in ROA is associated with a 0.014 unit escalation in tax avoidance. Enterprises realizing stronger financial gains may have more incentive to reduce their tax burden [57].
- Loss Carryforwards: A regression coefficient of 0.276 implies that an increment of one unit in loss carryforwards is associated with a proportional increase of 0.276 units in the level of tax avoidance. Loss carryforwards allows enterprises to reduce their taxes in the following period [37].
- Debt Levels: A regression coefficient of -0.027 for debt levels implies that tax avoidance decreases by 0.027 units for each one-unit increment in debt levels. Enterprises with higher debt levels may have less flexibility in tax management [38].

Overall, the outcomes of this regression study offer important perspectives on variables impacting tax avoidance practices in Indonesian manufacturing industry enterprises. Although some variables have a significant influence, it is important to consider that these results should be interpreted with caution, given the limitations of the data and models used.

Hypothesis Testing

This section examines the significance of how independent variables shape tax avoidance (CETR) through partial and simultaneous statistical analysis.

- 1) *T-test (partial)*: By applying the t-test, one can quantify the separate effect of each predictor variable on the outcome variable. The standards guiding decision processes were based on significance values ($\alpha = 5\%$). If the p-value < 0.05 , the variable is considered to have a significant effect [54]. Presented in Table 7 are the statistical outcomes of the t-test.

Hypothesis:

- H_0 : Firm scale (X1) is not associated in a positive manner with tax avoidance
- H_a : Firm scale (X1) is associated with an increased likelihood of tax avoidance (Y)

Table 7: t-Test Results

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	2.886	3.356	.860	.391
	Firm Scale	.125	.255	.489	.126
	Longevity	.029	.039	5.743	.009
	ROA	.014	.070	4.206	.037
	Loss Carryforwards	.276	1.225	2.225	.022
	Debt Levels	-.027	.029	3.926	.056
a. Dependent Variable: CETR					

Interpretation of Results:

- Firm Scale (X1): A p-value of 0.126 (> 0.05) makes it evident that the scale of the enterprises does not meaningfully impact tax avoidance behavior. This aligns with the empirical work undertaken by Adelina (2012); it has been noted that large enterprises are inclined to evade the threats linked to regulatory monitoring [7].
- Longevity (X2): A p-value of 0.009 (< 0.05) makes it evident that the enterprise's longevity shows a marked positive association with tax avoidance behavior. Older firms have strategic experience in optimizing tax loopholes [6].
- Profit Margins (ROA) (X3): p-value 0.037 (< 0.05) proves profit margins increase tax avoidance tendencies. These outcomes strongly agree with the data of Kurniasih & Sari (2013), where enterprises with high ROA are more aggressive in tax management [3].
- Loss Carryforwards (X4): p-value 0.022 (< 0.05) indicates significant loss carryforwards affects tax avoidance. This facility allows enterprises to defer tax liabilities [14].
- Debt Levels (X5): A p-value of 0.056 (> 0.05) suggests that debt levels do not exert a meaningful impact. These findings contradict research by Kurniasih & Sari (2013), Perhaps due to the high variation in debt structure between companies [3].

Theoretical and Practical Implications: Partially, the company's lifespan, profitability, and compensation for fiscal losses are proven to be the main determinants of tax avoidance. These results reinforce the theory of agency, in which managers use resources to minimize the tax burden [12]. For regulators, these insights call attention to the imperative of thoroughly evaluating firms with high profitability and a history of fiscal loss compensation. Follow-up research is suggested by extending the period and exploring contextual variables such as government policies.

- 2) *F Test (simultaneous)*: The goal of conducting the F test is to ascertain whether the predictor variables collectively influence the outcome (firm scale, longevity, profit margin, loss carryforwards, and debt levels) on tax avoidance behavior. This analysis aims to ascertain whether the five variables can explain variations in tax avoidance practices. Hypothesis:
- H_0 : Firm scale, longevity, profit margin, loss carryforwards, and debt levels are missing a simultaneous meaningful impact on tax avoidance.
 - H_a : The five independent variables exert a profound impact simultaneously on tax avoidance.

Considering the F test data and the empirical measurement inferences generated through multiple regression, data interpretations obtained a Significance F value of 0.002 ($\alpha = 0.05$). Since the p-value < 0.05 , H_0 does not hold under the current test conditions, and the data justify the acceptance of H_a . This shows that firm scale, longevity, profit margin, loss carryforwards, and debt levels exert a profound impact on tax avoidance.

Table 8: Analysis of Variance						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	93.799	5	18.760	.380	.002 ^a
	Residual	6512.530	132	49.337		
	Total	6606.329	137			
a. Predictors: (Constant), firm scale, longevity, profit margin (ROA), loss carryforwards, and debt levels						
b. Dependent Variable: CETR						

Theoretical Implications: These findings are in line with agency theory Anthony & Govindarajan (2005), where managers use the enterprise's resources to strategically minimize fiscal obligations by adopting a holistic, multi-angle approach [12]. These outcomes are aligned with the conclusions of prior research by Kurniasih & Sari (2013), which confirms that structural factors (scale, longevity) and financial performance (profit margin, debt levels) interact with each other in influencing tax practices [3]. Although statistically significant, the magnitude of the simultaneous influence ($R^2 = 0.614$) shows that a significant 38.6% portion of the diversity in approaches to tax avoidance is influenced by variables excluded from the model. Further research is suggested by adding contextual variables such as intellectual capital intensity or institutional pressures.

- 3) *R² Test (determination regression coefficient)*: Determination coefficient analysis, or R^2 , assesses how far an independent element accounts for the fluctuations observed in the dependent construct. This coefficient of determination is the square of this coefficient. It quantifies the degree to which the attributes examined through the regression approach are interconnected, offering valuable information about their relationship strength. In this research, given that it involves several independent variables, the results of the measurements considered is Adjusted R^2 to account for the extent of determinant accounted for the model.

Table 9: R ² Test				
Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	.119 ^a	.614	.642	7.02405
b. Dependent Variable: CETR				

Rooted in Table 9, With an Adjusted R^2 value standing at 0.614, the model successfully captures around 61.40% of the variability in tax avoidance behavior (CETR) is supported by a combination of firm scale (X1), longevity (X2), profit margins (X3), loss carryforwards (X4), and debt levels (X5). An additional 38.60% of the variance can be attributed to variables beyond the scope of this model.

Our analysis demonstrates that the regression approach constructed indicates a positive result in explaining how the independent elements interact to produce effects on the dependent construct, although there is still room for improvement by considering additional variables that may be relevant. An R^2 value almost equal to 1 indicates that the model has strong

predictive capabilities, while a value far from 1 indicates limitations in interpreting the variability exhibited by the dependent variables. Thus, this R^2 value analysis provides a clear picture of how well the regression model captures the underlying relationships in describing the relationship between variables shaping the strategy of minimizing tax liabilities within enterprises in the manufacturing industry in Indonesia. Further inquiry is recommended to explore other variables contributing to such variations and improve the model's accuracy.

C) Analytical Insights

In this research, five hypotheses are tested to analyze how diverse variables shape behaviors related to tax avoidance. An in-depth analysis of the findings is presented below for each hypothesis.

1) How firm scale influences tax avoidance practices

Hypothesis one (H1) posits that the scale of firms affects tax avoidance practices in manufacturing industry enterprises listed on IDV. Firm scale is measured through total asset logs, which are considered more stable and consistent than other proxies [52]. With a significance level calculated at 0.126, which surpasses the 0.05 cutoff, the study supports the default proposition (H_0) while dismissing the alternative hypothesis (H_a). Evidence shows that the scale of a firm lacks a notable effect on the propensity to avoid taxes in the manufacturing industry. These findings differ from studies by Kurniasih & Sari (2013), was discovered that the magnitude of a firm exerts influence over its tendency to take part in tax avoidance [3]. This may be due to a significant portion of the sampled small enterprises struggling to maintain competitive viability.

2) How longevity influences tax avoidance practices

Hypothesis two (H2) posits that the longevity of the enterprise affects tax avoidance practices. Longevity is represented by the period the enterprise has been operating since its inception. A significance value of 0.009 was obtained through analysis, confirming it is smaller than the threshold of 0.05 for statistical significance, so the default proposition (H_0) was used while dismissing the alternative hypothesis (H_a). Evidence points to the longevity of the enterprise as a meaningful determinant in the practice of tax avoidance. These insights corroborate the observations reported in Dewinta & Setiawan (2016), as indicated by research indicating that enterprises with longer lifespans characteristically show a better reputation and trust from consumers, thus influencing their tax management strategies [9].

3) How profit margins influence tax avoidance practices

Hypothesis three (H3) tests the effect of profit margins on tax avoidance, analyzed with ROA as the performance measure. The analysis yielded a p-value of 0.037, indicating statistical significance as it falls below the 0.05 threshold. Thus, the evidence led to the rejection of H_0 and the acceptance of H_a . In manufacturing enterprises, profit margins emerge as a key determinant affecting tax avoidance practices. These findings support Dewinta and Setiawan (2016) discovered in their investigation that profit margin affects the enterprise's tax strategy [9]. Elevated net profit levels generated by an enterprise elevated the benefit of managing tax obligations effectively.

4) How loss carryforwards influence tax avoidance practices

Hypothesis number four (H4) states that loss carryforwards affect tax avoidance. Outcomes obtained from the analysis indicated a statistically significant outcome with a value of 0.022, which falls under the 0.05 cutoff; the default proposition (H_0) was dismissed in favor of the alternative Hypothesis (H_a). This shows that loss carryforwards strongly influence tax avoidance practices in manufacturing enterprises. Research by Kurniasih & Sari (2013) also found that compensation for fiscal losses can be used to reduce tax liabilities for five years after the loss occurs [3].

5) How Debt Levels Influence Tax Avoidance Practices

The last Hypothesis (H5) tests The role of debt levels on enterprise tax avoidance behavior in the manufacturing industry. With a significance level calculated at 0.056, which surpasses the 0.05 benchmark, the data supported retaining the default proposition (H_0) while dismissing the alternative hypothesis (H_a). The outcomes demonstrate that debt levels lack a statistically meaningful influence on tax avoidance practices in the manufacturing industry. These findings align with Kurniasih & Sari (2013) which also states that the debt levels do not considerably drive the enterprise's strategic decisions related to tax avoidance [3].

V. CONCLUSION

After careful data analysis of Indonesian manufacturing industry enterprises listed on IDX, this research reveals complex dynamics in tax avoidance practices. Although The fundamental assumption test provides data that is eligible for further analysis, the results provide a nuanced illustration of the characteristics that influence the enterprise's tax strategy. The firm's scale, although often accepted as a core determinant, does not appear to obtain an individual noteworthy influence on tax avoidance practices in this context. In contrast, longevity, profit margins, and loss carryforwards emerged as important factors influencing tax-related decisions. The longevity of an enterprise reflects experience and reputation, profit margin provides an incentive to manage tax liabilities, and loss carryforwards offers opportunities to reduce tax burdens. In addition, simultaneous tests confirm

that combining these factors significantly affects the company's tax avoidance rate. These findings highlight the need for a comprehensive approach to understanding and regulating corporate tax practices, considering various corporate characteristics and financial incentives.

Based on these results, A range of recommendations may be taken into account by multiple stakeholders. First, the enterprise's management needs to focus on increasing profit margin and managing assets effectively, as these factors are important in supporting tax payments. An increase in profits will allow the company to meet its tax obligations without sacrificing financial stability. Second, further research can expand the scope by adding diverse independent contributors who can drive decisions related to tax avoidance tendencies, such as the defining qualities of corporate governance, intellectual capital intensity, and institutional pressures. In addition, research can expand the sample to cover longer periods and different industry sectors to improve the generalization of findings. Thus, future research can present a broader analysis of the influences behind tax avoidance strategies and provide the basis for more effective tax policies.

Interest Conflicts

The author declares that no financial or otherwise conflicts are present that could be perceived as affecting the integrity of this research. This research was undertaken independently and devoid of undue influence from third parties.

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