

Firm's Life Cycle and Tax Avoidance: Longitudinal Evidence on the Mediating Role of Financial Distress

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Abstract

This study investigates the effect of the life cycle on tax avoidance, with a particular focus on the mediating role of financial distress. It uses a sample of 9,773 firm-years and longitudinal data on firms listed on the Indonesia Stock Exchange from 2007 to 2024. It obtains the data from the Refinitiv database. This study implements three estimators: fixed-effects panel data (stepwise test), Structural Equation Modeling (SEM) (simultaneous and mediating effect tests), and the Generalized Method of Moments with instrumental variables (GMM IV) to address endogeneity. These results indicate the effect of life cycle on tax avoidance and the mediating effect of financial distress on that relationship. This effect appears in the introductory and declining firms. Conversely, growth and mature firms are associated with lower financial distress and lower tax avoidance. Thus, financial distress does not mediate the relationship in either stage. This study is one of the few that compares the direct effect of the life cycle on tax avoidance with the mediating effect of financial distress. It contributes to the literature by establishing a systematic framework for how corporate evolution can influence tax avoidance practices, both directly and mediated by financial distress.



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Introduction

Taxes fund national development, increase economic growth, and improve public welfare through public services (Pratysto, 2025). However, taxes reduce net income and constitute an operational financial obligation that regularly and significantly burdens cash outflows (Nebie & Cheng, 2023). This situation encourages firms to develop strategies to reduce tax liabilities, thereby reducing the tax burden and improving cash disbursement efficiency (Chen & Zhao, 2026).

From a governance perspective, this practice is considered socially irresponsible and undermines compliance, ethics, and public trust (Bird & Davis-Nozemack, 2018). This practice reduces state revenue by lowering the effective tax rate below the government-set official tax rate (Hasan et al., 2017). Tax avoidance has a global negative impact, prompting many countries to adopt policies to combat this aggressive strategy (Kovermann & Velte, 2021).

Tax planning is a crucial activity that generates resources (Medioli et al., 2020). Through this strategy, firms gain greater flexibility in using cash to acquire strategic resources and increase firm value (Mujiyati et al., 2022; Nebie & Cheng, 2023). However, a counterargument is that tax avoidance generates excess cash, which can be counterproductive by reducing managers' effective use of resources (Gabrielli & Greco, 2023).

The above discussion encourages investigation into the effect of a corporation's dynamic conditions on tax policy. Firm dynamics are summarized across life-cycle stages, from introduction and growth to maturity and decline. Because of operational characteristics, each stage has distinct investments, financing,

and risks, and strategic decisions, including tax decisions, can also differ. Thus, the firm's life cycle is relevant for understanding variations in tax avoidance behavior across firms.

The firm's life cycle is also a crucial factor in determining its vulnerability to financial distress (Palupi & Na'im, 2024). Firms in the introduction and decline stages face a higher risk of financial distress because of low profits and uncertain cash flows. Conversely, firms in the growth and maturity stages tend to generate high profits and stable cash flows (Habib & Hasan, 2019; Dickinson et al., 2018). In contrast, financial distress drives tax avoidance. Introductory and declining firms tend to use tax avoidance as a strategy to obtain resources to avoid default. However, it does not apply to growth and mature firms (Gabrielli & Greco, 2023).

Empirically, researchers have extensively studied the relationship between the corporate life cycle and tax avoidance (e.g., Hasan et al., 2017; Jacob et al., 2021; Ehsani & Osiyevskyy, 2023). Most studies indicate that companies in the introduction and decline stages tend to be more aggressive in engaging in tax avoidance, while companies in the growth and maturity stages tend to be more conservative due to considerations of reputation and long-term sustainability (e.g., Hasan et al., 2017; Agyei et al., 2020; Irawan & Afif, 2020; Su et al., 2026). However, other studies indicate that this tendency is not determined solely by the life cycle stage but is also influenced by the company's financial condition, such as anticipated default risk (e.g., Gabrielli & Greco, 2023). These findings indicate that the relationship between the corporate life cycle and tax avoidance cannot yet be fully explained by direct influence; therefore, further research is needed to identify the internal mechanisms underlying this relationship.

In contrast, several studies show that financial distress increases a company's likelihood of engaging in tax avoidance (e.g., Dang & Tran, 2021; Ariff et al., 2023; Ehsani & Osiyevskyy, 2023; Halim et al., 2025; Chen & Zhao, 2026). However, these studies generally analyze the effect of financial distress on tax avoidance separately from the company's life cycle. However, conceptually and empirically, a company's life cycle stage influences its financial condition, which in turn may affect tax avoidance decisions. Therefore, research integrating the corporate life cycle, financial distress, and tax avoidance into a single mediation model remains very limited. This gap presents an opportunity to examine whether financial distress explains how the firm's life cycle influences tax avoidance.

Based on this research gap, this study examines the effect of firms' life cycle on tax avoidance by investigating the mediating role of financial distress. This is the study's novelty. This research bridges the gap in the effect of life cycle on tax avoidance, which has not yet been explored in terms of mediation (e.g., Hasan et al., 2017) or moderation (e.g., Gabrielli & Greco, 2023). Firms may exhibit weaker cash flow performance at a certain stage, but financial distress is not inherently part of Dickinson's (2011) life-cycle classification scheme. Instead, financial distress encompasses declines in profitability, liquidity, and solvency indicators (Zmijewski, 1984). Therefore, corporate life cycle and financial distress are not autocorrelated.

The hypotheses were tested using longitudinal data from 2007 to 2024 from listed firms on the Indonesia Stock Exchange, excluding financial firms. This study used data from the Thomson Reuters Refinitiv database. The sample excludes financial firms because they have different cash flow patterns than other firms. The results are robust after using three estimators: fixed effects, SEM, and GMM IV. Using 9,773 firm-years, this study finds that a firm's life cycle directly affects tax avoidance. Financial distress also mediates this relationship. Specifically, these effects occur during firms' introduction and decline. Conversely, growing and mature firms are less likely to experience financial distress and to avoid taxes.

This research contributes to the growing literature on tax avoidance behavior. This study is among the few that empirically investigate the direct effect of a firm's life cycle on tax avoidance and the mediated effect of financial distress. Each life-cycle stage varies in financial distress and helps explain why these conditions may encourage or constrain tax avoidance. This relationship has rarely been analyzed in an integrated manner, thereby limiting systematic understanding of the mechanisms linking corporate life cycles to tax avoidance practices.

Literature Review and Hypotheses Development

This study integrates organizational life cycle theory, prospect theory, and agency theory to explain the direct effects of the life cycle on tax avoidance and the mediating effect of financial distress. Organizational life cycle theory describes that each firm's life cycle stage (introduction, growth, maturity, and decline) exhibits distinct operational, investment, financing, and risk characteristics. Specifically, Dickinson (2011) identified distinct operating, investing, and financing cash-flow behaviors at each life-cycle stage. Firms in the introduction and decline stages face resource constraints that lead to financial distress. This condition encourages these firms to obtain resources through tax avoidance (Hasan et al., 2017). Meanwhile, broader access to funding sources and high profitability enable growth and mature firms to avoid taxes and maintain their established reputation (Gabrielli & Greco, 2023). This theory explains the non-linear relationship between a firm's life cycle and tax avoidance, with tax avoidance increasing during the introduction and decline stages and decreasing during the growth and maturity stages (Hasan et al., 2017).

Prospect theory (Kahneman & Tversky, 1979) can explain financial distress at certain life-cycle stages. This theory states that individuals and organizations tend to take more risks when facing losses or pressure than when facing profits. In the corporate context, deteriorating financial performance increases pressure to maintain business continuity, cash flow stability, and profit targets. This situation encourages firms to make more aggressive decisions to conserve resources and maintain financial performance, including tax avoidance strategies.

In agency theory, management may be encouraged to demonstrate better performance to investors, even using pragmatic means such as tax avoidance. When a firm experiences financial distress, pressure on management increases because low profitability can impact compensation, reputation, and performance evaluations. Under these conditions, managers have an incentive to minimize expenses and cash outflows through tax avoidance. Thus, integrating these three theories shows that a firm's life-cycle stage influences its financial performance and that this decline subsequently motivates firms to avoid taxes.

Specifically, this study used life cycle theory and agency theory to explain how a firm's life cycle affects tax avoidance. Life cycle theory also explains how the life cycle influences financial distress, while prospect theory and agency theory explain how financial distress influences tax avoidance. Finally, integrating the three theories explains the mediating effect of financial distress on the relationship between the life cycle and tax avoidance.

Firm's Life Cycle and Tax Avoidance

The stages of a firm's life cycle, which reflect different firm-level characteristics, relate to how firms structure their tax policies (Wang et al., 2020), including tax avoidance decisions. Therefore, differences reflected in a firm's operational, investment, and financing activities (Dickinson, 2011) can influence the level of corporate tax avoidance (Gabrielli & Greco, 2023).

In the introduction stage, firms tend to invest heavily to drive sales growth, resulting in higher deferred taxes (Hasan et al., 2017). They often raise resources through tax avoidance because they struggle to access external funding (Cerrato et al., 2022). Similarly, firms in the decline stage experience declining operating cash flow, reduced financing opportunities, and increased capital costs (Hasan et al., 2017). This situation encourages firms to pursue riskier means to meet their resource needs, such as reducing tax payments (Hasan et al., 2017; Ehsani & Osiyevskyy, 2023). According to agency theory, management's risk-taking decisions to meet resource needs align with shareholder interests (Hasan et al., 2017; Habib & Hasan, 2019).

Conversely, growth and mature firms tend to avoid aggressive tax-planning strategies. Growth firms have higher profits and positive cash flow, so they face less difficulty meeting resource needs. Similarly, mature firms tend to have stable cash flow and higher profitability. Firms in both stages are better able to meet resource needs without engaging in aggressive tax avoidance practices. Furthermore, they also face increased stakeholder scrutiny and seek to maintain their reputations (Irawan & Afif, 2020). This encourages them to avoid tax avoidance practices.

Empirically, the introduction and decline stages are associated with higher tax avoidance, whereas the growth and maturity stages are associated with lower tax avoidance (Hasan et al., 2017; Gabrielli & Greco, 2023). This also shows that risk-taking is higher in the introductory and declining firms than in the growth and mature firms (Habib & Hasan, 2017).

H1. Introductory and declining firms are more likely to engage in tax avoidance than firms in other stages.

Firm's Life Cycle and Financial Distress

Life cycle theory explains that, from organizational and financial perspectives, a firm's ability to generate cash flow, obtain funding, and maintain profitability varies throughout its life cycle. As a result, the stage of a firm's life cycle influences its ability to generate profits and maintain financial stability. Therefore, a firm's position in the life cycle is a critical factor in determining its vulnerability to financial distress (Palupi & Na'im, 2024).

Firms in the introduction stage are in the initial stage of market entry and face high uncertainty, low profit margins, and uncertain cash flows (Habib & Hasan, 2017). Reliance on external funding makes firms more vulnerable to liquidity pressures if they fail to meet growth targets or economic conditions worsen. Growth firms tend to have stable competencies and achieve market success, supported by high net asset value, equity, and profits (Dickinson et al., 2018). High growth prospects at this stage give firms opportunities to raise additional capital from investors and creditors, helping them manage financial distress risk.

In the maturity stage, firms typically have a stronger financial position, stable operating cash flow, established market share, and the ability to generate consistent profits (Dickinson et al., 2018). Operational and financial stability at this stage helps protect against economic shocks and business pressures, so the risk of financial distress tends to be low. In the decline stage, firms face slowing sales growth, declining profitability, reduced operational efficiency, and a weakened ability to generate cash flow. Firms at this stage tend to show weaker financial performance than firms in other stages. Therefore, declining firms face a higher risk of financial distress because available resources become increasingly limited in supporting business sustainability.

Empirical evidence shows that firms in the introduction and decline stages are vulnerable to failure due to resource constraints. Conversely, firms in the growth and maturity stages tend to be more resistant to failure because they have sufficient resources and capabilities to run dynamic operations (Ehsani & Osiyevskyy, 2023).

H2. Introductory and declining firms experience more financial difficulties than growth and mature firms.

Financial Distress and Tax Avoidance

Agency theory explains that when a firm experiences financial distress, management faces greater pressure to recover. Driven by moral hazard (Jacob et al., 2021), tax avoidance becomes a strategy to reduce the tax burden and maintain the firm's after-tax profit and cash flow. Thus, financial distress increases management's incentive to take actions that can improve reported financial results.

Based on prospect theory (Kahneman & Tversky, 1979), when a firm experiences financial distress, a risk-taking decision maker is willing to take risks to avoid greater losses. Tax avoidance becomes an alternative because it offers economic benefits, including tax savings and increased cash flow, despite the inherent risks of tax audits, disputes, and reputational damage (Duong et al., 2021). Empirically, Gabrielli and Greco (2023) found that introductory and declining firms with tax-avoidance experience have a lower probability of default. This indicates that a tax-avoidance strategy can generate cash savings, allowing the firm to recover resources and avoid default. Thus, economic pressures stemming from financial difficulties can encourage firms to pursue more aggressive tax planning to increase profitability and liquidity.

H3. Financial difficulties encourage increased tax avoidance practices.

Firm's Life Cycle, Financial Distress, and Tax Avoidance

In corporate life cycle theory, financial conditions naturally change as a firm transitions between stages. When a firm enters the introduction and decline stages, its ability to generate profits and cash flow tends to weaken because of low market demand, increased competitive pressure, or decreased operational efficiency. Empirically, Ehsani and Osiyevskyy (2023) show that financial failure tends to occur in firms in the introduction and decline stages.

In agency theory, financial distress can increase pressure on management because declining profits often come with lower market valuations, heightened shareholder scrutiny, and greater risks of reduced compensation and reputational damage. To mitigate this pressure, management uses tax avoidance strategies to reduce its tax burden. In this context, financial distress becomes a mechanism that encourages management to avoid taxes. According to prospect theory, when a firm faces financial difficulties, management tends to take more risks, such as through tax avoidance strategies, to avoid greater losses, despite the reputational risk. Empirical evidence suggests that defaults tend to be minimized in introductory and declining firms that avoid taxes. Conversely, in growth and mature firms, high levels of tax aggressiveness can trigger inefficiencies due to excess resources (Gabrielli & Greco, 2023).

Logically, the effect of a firm's life cycle on tax avoidance is not always direct. Firms' entry and decline do not necessarily lead to tax avoidance simply because they are in those stages. However, certain life-cycle characteristics can lead to deteriorating financial performance, which in turn encourages management to seek resource-saving alternatives, including tax avoidance. Thus, financial distress may explain the additional effect of a firm's life cycle on tax avoidance. Therefore, financial distress is suspected to mediate this relationship.

H4. Financial distress strengthens the influence of the introduction and decline stages in driving tax avoidance.

Research Method

The sample includes listed firms on the Indonesia Stock Exchange (IDX) between 2007 and 2024, excluding financial firms because of their cash flow structures different from those of other sectors (Dickinson, 2011). Data for 9,773 firm-years (Table 1) were obtained from the Thomson Reuters Refinitiv database. The influence of outliers was minimized using the winsorizing method, which replaced outlier values with values at the 1st and 99th percentiles.

Table 1. Sample Based on Industry

GICS	Industry	Freq.	Percent
10	Energy	859	8.79
15	Materials	1,342	13.73
20	Industrials	1,962	20.08
25	Consumer Discretionary	1,541	15.77
30	Consumer Staples	1,417	14.5
35	Health Care	411	4.21
45	Information Technology	349	3.57
50	Communication Services	633	6.48
55	Utilities	104	1.06
60	Real Estate	1,155	11.82
Total		9,773	100

Source: Secondary data processed (2026)

Tax avoidance is measured using the residual from the regression of book-tax differences on total accruals (RBTD) (e.g., Hasan et al., 2017; Gabrielli & Greco, 2023; Su et al., 2026; Lilge et al., 2026). A higher RBTD value indicates a higher level of tax avoidance (Hasan et al., 2017). The firm's life cycle is measured using a cash flow pattern approach based on Dickinson's (2011) classification, which combines

operating cash flows (CFO), investing cash flows (CFI), and financing cash flows (CFF). The classification is based on the sign (positive or negative) of the three types of net cash flows. The introduction stage is grouped based on negative CFO, negative CFI, and positive CFF. The growth stage is characterized by positive CFO, negative CFI, and positive CFF. The mature stage is identified based on positive CFO, negative CFI, and negative CFF. The decline stage is grouped based on negative CFO, positive CFI, and negative CFF. Dickinson grouped various combinations of cash flows that do not fall into other categories as the shake-out stage. This study combined the shake-out stage with the decline stage because both tend to share characteristics, such as a tendency toward performance failure (Ehsani & Osiyevskyy, 2023).

Financial distress shows the firm's inability to generate profits and maintain financial stability. Financial distress is proxied using the (Zmijewski, 1984) model, which calculates the Zmijewski score (ZMI) using three main indicators: profitability, as measured by return on assets (ROA), leverage, as measured by the debt-to-assets ratio (LEV), and liquidity, as measured by the current ratio (LIQ). A higher Zmijewski score indicates financial distress. The ZMI formula is shown in Table 2.

Table 2. Variable Definitions

Variables	Definitions
RBTD	The residual of the regression between the book-tax difference and the total accruals.
CLC1-5	Firm's life cycle grouping based on cash flow (Dickinson, 2011).
ZMI	The Zmijewski index = $-4.336 - 4.513 (\text{EAT}/\text{Total Assets}) + 5.679 (\text{Debt}/\text{Total Assets}) + 0.004 (\text{Current Assets}/\text{Current Liabilities})$.
SIZE	Natural logarithm of assets.
GROWTH	Percentage change in total assets between periods.
CASH	Cash holding equal to the ratio of cash and cash equivalents to total assets, reflecting the firm's liquidity and the availability of internal funds.
HHI	The Herfindahl Index is the sum of the squares of firms' market shares in an industry, where market share is the ratio of a firm's sales to the industry's total sales for the same year.
PROFIN	Industry profitability is measured by the industry-average net income to total assets.
COVID	Dummy 1 for pandemic years 2020-2022, 0 for other years.
IND	Two-digit GICS industry sector classification, except for the financial industry sector.
YEAR	2007 to 2024.

Referring to previous studies (e.g., Palupi et al., 2021; Salsabilla & Kholid, 2025; Chen & Zhao, 2026), this study uses control variables in the form of firm characteristics: firm size (SIZE), growth (GROWTH), and cash holdings (CASH); industry characteristics: competitive intensity as measured by the Herfindahl index (HHI), industry profitability (PROFIN), and GICS industry classification (IND), as well as macro conditions: COVID, and controlling for YEAR.

Larger firms generally have better access to funding and thus tend to have a lower risk of financial distress and tax avoidance. Growth reflects the ability to generate future income, thus lowering the potential for financial distress. However, greater investment and funding needs can encourage tax avoidance. Cash holdings reflect a firm's level of liquidity. High liquidity reflects a low risk of financial distress and tax avoidance. Higher competitive intensity (HHI) can increase the risk of financial distress by reducing profit margins and encouraging firms to engage in tax avoidance as a cost-efficiency strategy. Industry profitability (PROFIN) reflects stronger industry financial conditions, lowering the risk of financial distress but increasing the tax burden, which can influence firms' incentives to avoid taxes. All variable measurements are listed in Table 2.

Prior to hypothesis testing, this study conducted a preliminary test using the variance inflation factor (VIF) to identify multicollinearity among the independent variables. This study also tested for heteroscedasticity and endogeneity using the Breusch-Pagan/Cook-Weisberg test and *ivreg2*, respectively. The first hypothesis test uses stepwise fixed-effects regression, as indicated by the Chow and Hausman tests. The hypotheses were also retested using path analysis and Structural Equation Modeling (observed-

variable SEM in Stata) with covariances to test simultaneous and mediating effects, which can capture unmeasured factors and improve model fit (Palupi et al., 2025). SEM, in addition to providing robustness for testing direct effects in Hypotheses 1 to 3, was also used to test mediating effects in Hypothesis 4. Furthermore, to address endogeneity, heteroscedasticity, and the effects of lag variables, this study employed the Generalized Method of Moments with instrumental variables (GMM-IV). Equations 1-3 represent Hypotheses 1-3, and these equations were also used to test the fourth hypothesis.

$$RBTD_t = \alpha + \beta_1 CLC_t + \beta_2 SIZE_t + \beta_3 GROWTH_t + \beta_4 CASH_t + \beta_5 HHI_t + \beta_6 PROFIN_t + \beta_7 COVID_t + IND + YEAR + \varepsilon \quad (1)$$

$$ZMI_t = \alpha + \beta_1 CLC_t + \beta_2 SIZE_t + \beta_3 GROWTH_t + \beta_4 CASH_t + \beta_5 HHI_t + \beta_6 PROFIN_t + \beta_7 COVID_t + IND + YEAR + \varepsilon \quad (2)$$

$$RBTD_t = \alpha + \beta_1 ZMI_t + \beta_2 SIZE_t + \beta_3 GROWTH_t + \beta_4 CASH_t + \beta_5 HHI_t + \beta_6 PROFIN_t + \beta_7 COVID_t + IND + YEAR + \varepsilon \quad (3)$$

Results and Discussion

Table 3 shows the descriptive statistics. Winsorizing the 1st and 99th percentile data was performed to reduce the influence of outliers that could bias the research results. The average RBTD of -0.0168 indicates that the residual book-tax differences in the sample are relatively small and generally negative. Meanwhile, the average ZMI of -1.3733 indicates that the sample firms generally have relatively low financial health. The largest percentage is in the mature stage (CLC3) at 39.73%, while the decline stage, including shake-outs, accounts for 17.62% (decline stage = 15.37% and shake-out stage = 2.25%).

Table 3. Descriptive Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
RBTD	9,773	-0.0168	0.1179	-0.3582	0.4847
ZMI	9,773	-1.3733	2.5254	-4.5522	12.9543
SIZE	9,773	18.4643	1.8978	13.6804	22.6847
GROWTH	9,773	0.2593	1.1235	-0.9510	8.6554
CASH	9,773	0.0856	0.1016	0.0005	0.5352
HHI	9,773	0.0174	0.0041	0.0136	0.0281
PROFIN	9,773	0.0144	0.1080	-0.7332	0.5145
CLC	Freq.	Percent	Covid	Freq.	Percent
1	1,797	18.39	0	7,419	75.91
2	2,371	24.26	1	2,354	24.09
3	3,883	39.73	Total	9,773	100
4	1722	17.62			
Total	9,773	100			

Source: Secondary data processed (2026)

Table 4 shows the Pearson correlation of the variables. Almost all variables showed a significant correlation with RBTD ($p < 0.01$). Similarly, all CLCs (1-4) were significantly correlated with ZMI. All correlation coefficients were less than 0.50, indicating no multicollinearity among the independent variables. These results are supported by VIF values < 10 .

Table 4. Pearson Correlation

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1 RBTD	1											
2 CLC1	0.44	1										
3 CLC2	-0.12	-0.27	1									
4 CLC3	-0.35	-0.39	-0.46	1								
5 CLC4	0.14	-0.22	-0.26	-0.38	1							
6 ZMI	0.06	0.10	-0.03	-0.17	0.08	1						
7 SIZE	-0.13	-0.11	0.11	0.15	-0.20	-0.09	1					
8 GROWTH	0.05	0.08	0.05	-0.08	-0.03	-0.02	-0.11	1				
9 CASH	-0.07	-0.11	-0.00	0.09	0.00	-0.21	-0.02	0.01	1			
10 HHI	-0.05	-0.00	0.07	-0.01	-0.06	0.03	0.04	0.03	0.00	1		
11 PROFIN	-0.00	-0.03	0.02	0.01	-0.01	-0.05	0.04	0.03	0.02	0.17	1	
12 Covid	0.00	0.00	-0.05	0.01	0.05	-0.00	-0.06	0.03	0.02	-0.50	-0.08	1

Note: bold numbers indicate significance at $p < 0.01$

Source: Secondary data processed (2026)

Firm's Life Cycle and Tax Avoidance

Table 5 presents the results of stepwise testing of hypothesis 1, which examines the direct effect of life cycle on tax avoidance. CLC1 (introduction stage) and CLC4 (decline stage) show positive effects of 0.1115 and 0.0319, respectively (both significant at $p < 0.01$), while CLC2 (growth stage) and CLC3 (maturity stage) show negative effects on tax avoidance.

Table 5. Direct Effect of Firm's Life Cycle on Tax Avoidance

Dependent variable: RBTD				
	CLC1	CLC2	CLC3	CLC4
CLC	0.1115*** (0.0000)	-0.0230*** (0.0000)	-0.0734*** (0.0000)	0.0319*** (0.0000)
SIZE	-0.0065*** (0.0000)	-0.0012 (0.4569)	-0.0033** (0.0393)	0.0000 (0.9775)
GROWTH	-0.0004 (0.6588)	0.0015 (0.1578)	0.0005 (0.6105)	0.0018* (0.0804)
CASH	-0.1050*** (0.0000)	-0.1252*** (0.0000)	-0.1332*** (0.0000)	-0.1315*** (0.0000)
HHI	-4.7421*** (0.0000)	-3.2763*** (0.0000)	-4.5192*** (0.0000)	-3.2340*** (0.0000)
PROFIN	0.0059 (0.5799)	0.0045 (0.6975)	0.0072 (0.5113)	0.0051 (0.6585)
COVID	0.0058 (0.2317)	0.0097* (0.0627)	0.006 (0.2226)	0.0095* (0.4558)
IND	No	No	No	No
YEAR	Yes	Yes	Yes	Yes
_cons	0.1618*** (0.0000)	0.0617* (0.0789)	0.1503*** (0.0000)	0.0264 (0.0354)
N	9773	9773	9773	9773
R2	0.1635	0.0319	0.1173	0.0354
F	79.47***	13.39***	53.99***	14.93***

Note: ***, **, * are significant at $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively. p -value in parentheses.

Source: Secondary data processed (2026)

These results are consistent with the simultaneous and mediating tests with SEM in Table 8, which show a significant positive direct effect of CLC1 and CLC4 on BTM (CLC1 = 0.1277 and CLC4 = 0.0367,

p-value < 0.01). In contrast, CLC2 and CLC3 show negative effects on BTD (-0.0302 and -0.0791, respectively, p-value < 0.01). Overall, the findings support the first hypothesis, which states that introductory and declining firms have stronger incentives to avoid taxes than those in other stages. This finding suggests that differences in firm characteristics are associated with differences in their tax policy implementation (Cooper & Nguyen, 2020).

The results are consistent with prior studies (Hasan et al., 2017; Su et al., 2026). These results also indicate that introductory firms have limited resources to increase growth, so they seek opportunities to generate cash inflows. Similarly, declining firms tend to have limited resources to achieve these goals. Firms in both stages tend to adopt tax avoidance strategies to optimize cash flow. Conversely, growth and mature firms, which have strong cash flow, tend to have sustainable profits and are no longer interested in aggressive tax planning.

Firm's Life Cycle and Financial Distress

Table 6 presents the results of testing the second hypothesis, which examines the influence of the Firm's life cycle on financial distress. The test results are consistent with hypothesis 2, which posits that introductory and declining firms tend to avoid taxes more than firms in the growth and maturity stages.

Table 6. The Effect of Firm's Life Cycle on Financial Distress

Dependent variable: ZMI				
	CLC1	CLC2	CLC3	CLC4
CLC	0.1942*** (0.0001)	0.0424 (0.3330)	-0.2447*** (0.0000)	0.1319*** (0.0087)
SIZE	-0.8113*** (0.0000)	-0.8067*** (0.0000)	-0.8069*** (0.0000)	-0.7938*** (0.0000)
GROWTH	-0.0199 (0.2314)	-0.0181 (0.2769)	-0.0192 (0.2488)	-0.0142 (0.3962)
CASH	-3.0466*** (0.0000)	-3.1017*** (0.0000)	-3.0999*** (0.0000)	-3.0946*** (0.0000)
HHI	-55.2150*** (0.0000)	-53.7552*** (0.0000)	-56.3210*** (0.0000)	-51.7572*** (0.0000)
PROFIN	-0.5084*** (0.0057)	-0.5097*** (0.0056)	-0.5022*** (0.0062)	-0.5092*** (0.0056)
COVID	-0.0452 (0.5848)	-0.0405 (0.6247)	-0.0496 (0.5487)	-0.0377 (0.6491)
IND	No	No	No	No
YEAR	Yes	Yes	Yes	Yes
_cons	14.8130*** (0.0000)	14.7272*** (0.0000)	14.8950*** (0.0000)	14.4338*** (0.0000)
N	9773	9773	9773	9773
R2	0.1134	0.112	0.1156	0.1126
F	52.00***	51.27***	53.14***	51.57***

Note: ***, **, * are significance at $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively. p -value in parentheses.

Source: Secondary data processed (2026)

This is reflected in the positive and significant coefficients for CLC 1 and CLC 4 (0.1942 and 0.1319, both at $p < 0.01$). CLC 2 does not show a significant effect, but CLC 3 shows a negative effect on tax avoidance (p -value < 0.01). In Table 8, the results of simultaneous and mediation testing using SEM are consistent with previous findings. The introduction stage (CLC1) and the decline stage (CLC4) show significant positive effects of 0.4780 and 0.4843, both at $p < 0.01$. Conversely, growth (CLC2) and maturity (CLC3) stages had a negative effect on ZMI, as indicated by coefficients of -0.1195 (p -value < 0.05) and -0.4990 (p -value < 0.01), respectively. Overall, the results support Hypothesis 2: introductory and declining

firms are more likely to experience financial distress, while the opposite is true for firms in the growth and maturity stages.

This finding aligns with prior research (Ehsani & Osiyevskyy, 2023). It supports life cycle theory, which suggests that a firm's ability to generate cash flow, obtain funding, and maintain profitability varies across its life cycle. The introduction stage typically requires significant investment to support business expansion. Firms at this stage are in the initial market-entry phase and face high uncertainty, with low profit margins and cash-flow volatility. Meanwhile, firms in the decline stage often face slowing sales growth, declining profitability (Habib & Hasan, 2019), reduced operational efficiency, and weakened cash flow generation. This leads to weaker financial performance. Firms in both stages face a higher risk of financial distress because they have limited resources to sustain their businesses.

Conversely, growth and mature firms tend to have stable competencies and established markets, resulting in a stronger financial position, reflected in high assets, equity, and profits (Dickinson et al., 2018). Therefore, the likelihood of financial distress is relatively lower than in other stages.

Financial Distress and Tax Avoidance

Table 7 presents the effect of financial distress on tax avoidance. Using the overall data, financial distress (ZMI) has a positive effect on tax avoidance (RBTB), with a coefficient of 0.0026 (p-value < 0.01). Table 7 shows the effect of the firm's life cycle. In CLC1, CLC2, CLC3, and CLC4, ZMI has a positive and significant effect on RBTB (coefficients of 0.0010 (p-value < 0.05), 0.0023 (p-value < 0.01), 0.0009 (p-value < 0.05), and 0.0020 (p-value < 0.01), respectively). Thus, the results support the third hypothesis: financial distress encourages tax avoidance. Deteriorating financial conditions encourage firms to improve profitability and liquidity, making tax savings a strategy management considers. This situation suggests that financial pressure drives firms to avoid taxes (Dang & Tran, 2021) to increase revenue (Jacob et al., 2021).

Table 7. The Effect of Financial Distress on Tax Avoidance

	RBTB
ZMI	0.0026*** (0.0001)
SIZE	-0.0004 (0.8134)
GROWTH	0.0011 (0.2940)
CASH	-0.1227*** (0.0000)
HHI	-3.4436*** (0.0000)
PROFIN	0.0061 (0.5959)
COVID	0.0092* (0.0777)
IND	No
YEAR	Yes
_cons	0.0483 (0.1843)
N	9773
R2	0.0259
F	10.82***

Note: ***, **, * are significance at $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively. p -value in parentheses.

Source: Secondary data processed (2026)

The findings contrast with prior research (Nursiam & Kusumawati, 2025), which found that high-growth firms with larger assets tend to avoid taxes. Conversely, the results align with prior research (Ariff et al., 2023; Karlinah et al., 2024; Chen & Zhao, 2026), which found that financial distress drives tax avoidance. However, this study expands on these findings by demonstrating both the overall and life-cycle effects.

The findings confirm prospect theory, which holds that firms experiencing financial distress are more willing to take risks through tax-avoidance strategies. This situation increases shareholder pressure on management to meet performance targets, including maintaining profitability and liquidity to sustain the business. This explanation also aligns the findings with agency theory. Thus, firms facing financial pressure are more likely to reduce cash taxes paid (Palupi et al., 2021; Chen & Zhao, 2026), even though this action risks the firm's reputation. This aligns with Jacob et al. (2021)'s argument that management moral hazard drives the decision to avoid taxes.

Firm's Life Cycle, Financial Distress, and Tax Avoidance

Table 8 simultaneously presents the mediating effect of the life cycle on tax avoidance through financial distress. Consistent with the results of the first hypothesis, which showed a positive direct effect of life cycle on tax avoidance at the introduction and decline stages (Tables 3 and 8), the second hypothesis, which showed a positive effect of life cycle on financial distress (Tables 6 and 8), and the third hypothesis, which showed an effect of financial distress on tax avoidance (Tables 7 and 8), the introduction stage (CLC1) and the decline stage (CLC2) showed a positive mediating effect of financial distress. This is indicated by coefficients of 0.0005 ($p < 0.05$) and 0.0010 ($p < 0.01$).

Table 8. The Direct Effects of Firm's Life Cycle and Tax Avoidance and the Mediating Effect of Financial Distress

Path	CLC1	CLC2	CLC3	CLC4
CLC → ZMI	0.4780*** (0.0000)	-0.1195** (0.0400)	-0.4990*** (0.0000)	0.4843*** (0.0000)
ZMI → BTD	0.0010** (0.0290)	0.0023*** (0.0000)	0.0009*** (0.0450)	0.002*** (0.0000)
Direct Effect (CLC → BTD)	0.1277*** (0.0000)	-0.0302*** (0.0000)	-0.0791*** (0.0000)	0.0367*** (0.0000)
Indirect (Mediating) Effect (CLC → ZMI → BTD)	0.0005** (0.0360)	-0.0003* (0.0580)	-0.0004** (0.0490)	0.0010*** (0.0000)
N	9773	9773	9773	9773
SRMR	0.0000	0.0000	0.0000	0.0000
CD	0.2720	0.123	0.215	0.129

Note: ***, **, * are significance at $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively. p -value in parentheses.

Source: Secondary data processed (2026)

These results indicate that financial distress strengthens the positive effect of life cycle on tax avoidance at the introduction and decline stages, thus confirming the fourth hypothesis. Limited resources and access to external resources encourage firms at these stages to use tax avoidance to meet their resource needs (Cerrato et al., 2023). Conversely, for growth and mature firms, tax avoidance generates excess resources that can lead to inefficient use of resources and increase reputational risk (Gabrielli & Greco, 2023), making it less attractive as a source of cash (Hasan et al., 2017). Furthermore, firms tend to maintain their reputation because negative shareholder perceptions of tax avoidance make this strategy risky and costly (Duong et al., 2021).

These findings are consistent with Gabrielli and Greco (2023), which shows that firms in the introduction and decline stages tend to avoid taxes to obtain cash resources that can help them escape financial distress. Unlike that study, which used life cycle as a moderator, this study uses financial distress as

a mediator in the effect of life cycle on tax avoidance. This study extends these findings by showing that financial distress mediates the life-cycle effect on tax avoidance. The findings are expected to bridge the gap in the inconclusive body of research on the relationship between the life cycle and tax avoidance.

Endogeneity testing using *ivreg2* in Stata shows a p -value < 0.05 , indicating that the endogenous regressors are correlated with the error term and implying that the instruments in the model are also endogenous. These results, together with the Breusch-Pagan heteroscedasticity test results, support using GMM IV. The instrumental variables include the first and second lags of the endogenous variable. These variables have a persistent influence on the endogenous variables and are highly correlated with them. These variables are also balanced between relevance (Kleibergen–Paap < 0.05) and exogeneity (Hansen > 0.05). The GMM IV test results in Table 9 are consistent with the hypothesis testing results in Tables 5–8. Overall, the results support hypotheses 1–4.

Table 9. GMM for Endogeneity

<i>Panel A. Effect of Firm's Life Cycle on Tax Avoidance</i>				
	CLC1	CLC2	CLC3	CLC4
CLC	0.1685*** (0.0000)	-0.0273*** (0.0059)	-0.0840*** (0.0000)	0.0523*** (0.0002)
L.RBTD	0.0093*** (0.0006)	0.0102*** (0.0035)	0.0091*** (0.0033)	0.0097*** (0.0047)
Control	Included	Included	Included	Included
_cons	0.0821*** (0.0002)	0.1745*** (0.0000)	0.1526*** (0.0000)	0.1260*** (0.0000)
N	8122	8122	8122	8122
Hansen	0.9848	0.8586	0.7503	0.6472
Kleibergen–Paap	0.0000	0.0000	0.0000	0.0000
<i>Panel B. Effect of Firm's Life Cycle on Financial Distress</i>				
	CLC1	CLC2	CLC3	CLC4
CLC	0.0895*** (0.0086)	-0.0375 (0.1279)	-0.0457*** (0.0035)	0.0629** (0.0479)
L.DZMI	0.6763*** (0.0000)	0.6801*** (0.0000)	0.6785*** (0.0000)	0.6767*** (0.0000)
Control	Included	Included	Included	Included
_cons	0.1548*** (0.0022)	0.1900*** (0.0000)	0.1888*** (0.0000)	0.1355** (0.0131)
N	8122	8122	8122	8122
Hansen	0.4664	0.0362	0.8139	0.2096
Kleibergen–Paap	0.0000	0.0000	0.0000	0.0000
<i>Panel C. Effect of Financial Distress on Tax Avoidance</i>				
	RBTD			
DZMI	0.0158** (0.0140)			
L.RBTD	0.0101*** (0.0037)			
Control	Included			
_cons	0.1729*** (0.0000)			
N	8122			
Hansen	0.0158			
Kleibergen–Paap	0.0000	0.0000	0.0000	0.0000

Note: ***, **, * are significance at $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively. p -value in parentheses.

Source: Secondary data processed (2026)

This study tested the robustness of the findings using three tools. Firstly, panel data regression with fixed effects for stepwise testing. Secondly, simultaneous and mediation testing with SEM incorporating covariance. Thirdly, GMM IV to address endogeneity. All three test tools produced consistent results and overall supported the hypotheses.

Conclusion

This study investigates the relationship between corporate life cycle stage, financial distress, and corporate tax avoidance, using three estimators: fixed effects on panel data, SEM, and GMM IV. The findings indicate that the life cycle directly influences tax avoidance. Specifically, the results document that introductory and declining firms tend to avoid taxes, while growth and mature firms are less likely to do so. The findings also show that the life cycle mediates the effect of financial distress on tax avoidance. The results show that firms in the introduction and decline stages are more likely to experience financial distress and to evade taxes as an exit strategy, whereas the opposite is true for firms in the growth and maturity stages. Thus, the results confirm the non-linear relationship between a firm's life cycle and tax avoidance (Hasan et al., 2017), with high rates in the introductory and declining firms but low rates in growth and mature firms, consistent with the integrated predictions of corporate life cycle theory, prospect theory, and agency theory.

This study contributes to expanding the literature on corporate tax avoidance practices. It is one of the few studies to present detailed empirical evidence on the direct and mediating effects of a firm's life cycle on tax avoidance through financial distress. Researchers have paid little attention to these two effects, allowing for direct comparison. Varying levels of financial distress across life-cycle stages shape the incentives and constraints firms face in adopting tax avoidance strategies. This study also has practical contributions by informing tax authorities in designing risk-based tax compliance monitoring mechanisms, investors in making investment decisions, and managers in improving tax compliance to minimize reputational and regulatory risks.

This study is limited by its use of a single tax avoidance indicator. Using multiple indicators could broaden the scope of tax avoidance. Furthermore, this study is limited by its reliance on cash flow patterns to measure the life cycle. This measure may not fully reflect a firm's actual condition because it ignores industry characteristics and the competitive environment, which can affect a firm's life-cycle positioning.

Future research could consider other factors that may mediate the relationship between a firm's life cycle and tax avoidance, such as earnings quality and sustainability. Future studies could also use multiple measures of tax avoidance, including new measures developed in prior research (e.g., Lou et al., 2025), life-cycle measures, and financial distress measures, to ensure consistent results. To increase the generalizability of the results across different institutional contexts, the sample could be expanded across countries by including institutional variables.

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