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Capital Structure Across The Firm Life Cycle: A Moderating Role of Life Cycle in Indonesian Real Estate Sector

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ABSTRACT

This study investigates how firm life cycle stages moderate the relationship between capital structure determinants and leverage in the Indonesian real estate sector. Using panel data from listed real estate companies (2009–2024), firms are classified into young and mature groups based on retained earnings to total assets. Our analysis reveals that the firm life cycle is a significant moderator, with findings predominantly supporting the Pecking Order Theory. For young firms, leverage is strongly and negatively driven by liquidity, underscoring their reliance on internal funds. For mature firms, leverage is negatively influenced by profitability and liquidity. Asset tangibility also shows a significant but unexpectedly negative relationship for mature firms, while the tax shield is insignificant for both groups. These findings demonstrate that a firm's developmental stage is crucial for understanding its capital structure choices, which are shaped by both life cycle-driven financing constraints and sector-specific characteristics

Keywords **–** Asset Tangibility, Capital Structure, Firm Life Cycle, Leverage, Liquidity, Profitability, Real Estate

INTRODUCTION

Capital structure is an important financial decision of a firm, having a big impact on firm value and performance. There are two competing theories used to explain how firms determine their capital structure. The Trade-off Theory posits that firms seek an optimal capital structure by balancing the tax benefits of debt against the costs of financial distress, while the Pecking Order Theory argues that information asymmetry makes firms follow a financing hierarchy, prioritizing internal funds over debt, and debt over equity (Myers, 1984; Myers & Majluf, 1984).

A lot of empirical research has sought to validate these theories, yet the findings remain inconclusive, with studies often providing support for either framework depending on the context and sample (Graham & Leary, 2011). Based on these theories, the usual determinants used to explain leverage decisions include profitability, liquidity, asset tangibility, and tax shield. However, the explanatory power of these factors is not uniform across studies. Research has shown that the strength of these determinants in predicting debt levels varies across different economic environments (Rajan & Zingales, 1995), and the predictive power of certain theories may even decline over time (Frank & Goyal, 2003)

This inconsistency suggests that the influence of capital structure determinants to debt level is not absolute but may be influenced on specific firm characteristics. For example, Dananjaya, Gunawan, and Napitupulu (2025) found that the effect of capital structure determinants to debt level are different between firms with high growth and firms with low growth. Another possible factor is the firm's life cycle. As a company evolves from a young, growth-oriented stage to a mature, stable phase, its financing needs, risk profile, degree of information asymmetry, and access to capital markets change. Therefore, the effect of determinants on debt level might depend significantly on the company's life cycle stage (Lemmon & Zender, 2007).

The Indonesian real estate sector offers a particularly suitable setting to test this hypothesis. The industry is capital-intensive, often reliant on high levels of debt, and is characterized by a unique asset structure where land banks and development properties are key forms of collateral. Moreover, the Indonesian market features a diverse range of listed real estate firms at various stages of maturity. This study aims to contribute to the literature by investigating the moderating role of the firm life cycle in the relationship between capital structure determinants and leverage in this dynamic sector

LITERATURE REVIEW

Two main theories provide the foundation for understanding capital structure: the Trade-off Theory and the Pecking Order Theory. The Trade-off Theory suggests that a firm determines its optimal debt level by balancing the tax advantage of debt against the associated bankruptcy risk. At low debt levels, the tax benefit outweighs the low risk of bankruptcy, making it beneficial to add debt. As leverage increases, bankruptcy risk rises and eventually dominates the tax advantage, making it beneficial to reduce debt. A firm will thus settle at an optimal debt level that maximizes its value, influenced by factors that affect bankruptcy risk and tax benefits. For example, highly profitable firms face lower bankruptcy risk and can sustain higher debt levels (Myers, 1984).

In contrast, the Pecking Order Theory is based on information asymmetry between a company's managers and outside investors or creditors. This information gap makes external financing more costly than internal financing. Consequently, firms prioritize internal funds (e.g., from retained earnings) for new investments. If external funds are required, debt is preferred over equity because debt is a safer instrument, which reduces the adverse effects of information asymmetry (Myers & Majluf, 1984).

Based on these frameworks, several key determinants of capital structure have been identified. The Trade-off Theory predicts a positive relationship between profitability and leverage (H1a), as more profitable firms can better service debt and utilize tax shields. The Pecking Order Theory, however, predicts a negative relationship (H1b), as profitable firms have more internal funds and less need for external debt. For asset tangibility, Trade-off Theory suggests a positive relationship with leverage, as tangible assets can serve as collateral, lowering bankruptcy costs (H2). The theories also offer competing predictions for liquidity. Pecking Order Theory implies a negative relationship, as liquid firms have more internal funds (H3a), while Trade-off Theory can imply a positive one, as liquidity reduces financial distress risk (H3b). Finally, Trade-off Theory straightforwardly predicts a positive relationship between tax shields and leverage (H4).

Firms, however, are not static entities; they evolve through a life cycle, and their financial characteristics change accordingly. Young firms typically require high levels of investment while experiencing low profitability, whereas mature firms often require less investment and enjoy higher, more stable profits (Anthony & Ramesh, 1992; DeAngelo et al., 2006; Dickinson, 2011). This evolution has a direct impact on financing decisions. For instance, the cost of debt is often higher for young firms due to a lack of tangible assets and low cash flow (Kayhan & Titman, 2007). Similarly, the cost of equity is higher for young firms but lower for mature firms, which benefit from stable cash flows and less information asymmetry (Hasan et al., 2015).

The difference in behavior between young and mature firms suggests that the effect of capital structure determinants on debt levels may be moderated by the firm's life cycle. Lemmon and Zender (2007) found that the Pecking Order Theory is most relevant for young firms, which face the highest degree

of information asymmetry. A firm's life cycle can be effectively proxied by its retained earnings behavior; a higher accumulation of retained earnings signals maturity, as the firm has less need for reinvestment and can return profits to shareholders. This leads to our primary set of hypotheses regarding the moderating effect of the firm life cycle.

H5: The relationship between profitability and leverage is stronger for young firms than for mature firms.

Young firms typically face high information asymmetry and are thus expected to adhere more strictly to the Pecking Order Theory. Consequently, their reliance on internal funds should create a stronger negative relationship between profitability and the use of debt compared to more flexible mature firms

H6: The positive relationship between asset tangibility and leverage is stronger for mature firms than for young firms.

According to the Trade-off Theory, tangible assets serve as effective collateral. Mature firms possess established assets with more certain collateral value, which reduces lender risk and supports higher debt capacity. In contrast, young firms' assets are often less tangible or have more uncertain values, weakening this effect

H7: The relationship between liquidity and leverage is stronger for young firms than for mature firms.

Young firms, which face higher information asymmetry, will have a stronger preference to use available liquidity to fund investments rather than taking on debt, making the negative liquidity-leverage relationship more pronounced

H8: The positive relationship between tax shield and leverage is stronger for mature firms than for young firms.

The value of a tax shield is highest for firms with stable and significant taxable income, a characteristic more common to mature firms. Young firms may have more volatile or even negative earnings, making tax considerations a less significant driver of their financing decisions

METHODOLOGY

This study uses yearly data from publicly listed real estate companies on the Indonesia Stock Exchange for the period of 2009–2024. The financial data for all variables is sourced from Refinitiv. An unbalanced panel of firms covering the period 2009–2024 is used, as some firms entered the market after the beginning of the sample period.

Variable Measurement

The dependent variable in this study is leverage, while the independent variables are profitability, asset tangibility, liquidity, and tax shield.

- Leverage (LEV) is measured using the Debt-to-Equity Ratio, calculated as total debt divided by total equity.
- Profitability (ROA) is measured using Return on Assets, calculated as net income divided by total assets.
- Asset Tangibility (TANG) is calculated as total fixed assets divided by total assets.

- Liquidity (LIQ) is measured using the Current Ratio, calculated as current assets divided by current liabilities.
- Tax Shield (TAX) is measured as tax expense divided by earnings before tax.

To test the moderating effect of the firm life cycle, companies are classified into two groups: young and mature. This classification is based on the ratio of retained earnings to total assets. The median of this ratio is calculated across all data in the sample. Firms with a ratio below the median are classified as "young firms," while those with a ratio at or above the median are classified as "mature firms."

Data Analysis

The data is processed using Stata statistical software. To mitigate the influence of extreme outliers, all variables are winsorized at the 1% level. The variables are then centered before being used in the regression analysis.

This study employs a panel data regression model to examine the relationship between the determinants and capital structure. Specification tests, including the Chow, Breusch-Pagan, and Hausman tests, will be conducted to determine whether a Pooled OLS, Random Effects (RE), or Fixed Effects (FE) model is the most appropriate for the data.

The primary analysis involves splitting the sample into two sub-samples based on the life cycle classification (young and mature). The following regression model is then estimated separately for each group:

$$Leverage_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 Tangibility_{it} + \beta_3 Liquidity_{it} + \beta 4 TaxShield_{it} + \epsilon_{it}$$

Where i denotes the firm and t denotes the year. This approach allows for a direct comparison of the coefficients (β1 to β4) between the young and mature firm groups, thereby testing the hypothesized moderating effect of the firm life cycle.

RESULTS

A total of 786 data from 86 companies were collected. The data are divided according to the explanation in methodology section into young firms category consisting of 393 data and mature firm category consisting of 392 data.

TABLE I

DESCRIPTIVE STATISTIC OF MATURE FIRMS DATA

Variable	Obs	Mean	Std. Dev.	Min	Max
der_win	392	32.91339	31.13287	0	145.6698
roa_win	392	6.290775	8.145998	-6.180536	50.82438
tfa_ta_win	392	60.88609	21.76433	2.776187	97.26013
cr_win	392	3.11971	3.277433	.2405	23.66323
tax_ebt_win	392	11.05535	39.862	-316.5979	95.50842

Table 1 presents the descriptive statistics for the mature firm sub-sample, which consists of 392 firm-year observations. All variables have been winsorized at the 1% level to control for the effect of

outliers. On average, these firms exhibit a Debt to Equity Ratio of 32.91, a profitability (ROA) of 6.29%, and an asset tangibility ratio of 60.89. The average current ratio indicates a healthy liquidity position at 3.12, while the average tax shield stands at 11.05%. The large standard deviations for all variables, particularly for leverage (31.13) and tax shield (39.86), suggest considerable variation in the financial policies and characteristics within the mature firm group.

TABLE 2

DESCRIPTIVE STATISTIC OF YOUNG FIRMS DATA

Variable	Obs	Mean	Std. Dev.	Min	Max
der_win	393	66.78317	125.9631	0	886.2232
roa_win	393	.8508308	5.141586	-18.02275	19.75323
tfa_ta_win	393	58.09312	24.72384	.312978	97.79832
cr_win	393	2.783958	3.459932	.14676	21.20697
tax_ebt_win	393	13.43429	50.90813	-265.7128	217.6078

The descriptive statistics for the young firm sub-sample, which includes 393 firm-year observations, are presented in Table 2. All variables have been winsorized at the 1% level. On average, young firms show substantially higher leverage with a Debt to Equity Ratio of 66.78 and lower profitability (ROA) of 0.85%. Asset tangibility is slightly lower at 58.09, and the average Current Ratio is 2.78. The high mean and extremely large standard deviation for leverage (125.96) in this group point to a highly variable and more aggressive financing strategy compared to their mature counterparts.

Regression Result

Mature Firms

For the mature firm sub-sample, panel data specification tests were conducted to determine the appropriate model. The result of the **Chow Test** (F=0) and **Hausman test** (Prob > chi2 = 0.492) indicated that a **Random Effects (RE)** model is the best model. Subsequent diagnostic tests for the classical assumptions showed no issues with multicollinearity but confirmed the presence of both **heteroskedasticity** and **autocorrelation**. To address these issues and ensure the estimates are robust and efficient, the model was estimated using the **FEGLS** method.

TABLE 3

REGRESSION RESULT OF MATURE FIRMS DATA

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Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   common AR(1) coefficient for all panels  (0.7964)

Estimated covariances      =        40          Number of obs     =       387
Estimated autocorrelations =         1          Number of groups  =        40
Estimated coefficients     =         5          Obs per group:
                                                           min =         2
                                                           avg =     9.675
                                                           max =        16
                                                Wald chi2(4)      =     23.86
                                                Prob > chi2       =    0.0001
```

der_c	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
roa_c	-.3048958	.0716426	-4.26	0.000	-.4453126	-.164479
tfa_ta_c	-.1018298	.0458019	-2.22	0.026	-.1915999	-.0120596
cr_c	-.5432249	.210163	-2.58	0.010	-.9551367	-.131313
tax_ebt_c	.0030507	.0113867	0.27	0.789	-.0192668	.0253683
_cons	-10.5474	1.645952	-6.41	0.000	-13.77341	-7.321395

The regression results are presented in Table X. The overall model is statistically significant, as indicated by the Wald chi2 statistic of 23.86 ($p < 0.01$). The analysis shows that **profitability (ROA)** has a significant negative relationship with leverage (Coef. = -0.305, $p < 0.01$). **Liquidity (Current Ratio)** is also found to have a significant negative effect on leverage (Coef. = -0.543, $p < 0.05$). **Asset tangibility** shows a significant but negative relationship with leverage (Coef. = -0.102, $p < 0.05$), which is contrary to the typical prediction of Trade-off Theory. Lastly, the **tax shield** variable was found to have no significant effect on leverage.

Young Firm

For the young firm sub-sample, specification tests were conducted to select the appropriate panel data model. The result of the Chow test (F=0) and Hausman test (Prob > chi2 = 0.038) indicating that a Fixed Effects (FE) is the best model. Further diagnostic tests for the classical assumptions detected the presence of heteroskedasticity, while no significant issues were found with multicollinearity or autocorrelation. To produce robust standard errors that correct for this heteroskedasticity, the model was estimated using a Fixed Effects regression with Driscoll-Kraay standard errors

TABLE 4

REGRESSION RESULT OF YOUNG FIRMS DATA

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Regression with Driscoll-Kraay standard errors   Number of obs      =       393
Method: Fixed-effects regression                 Number of groups   =        64
Group variable (i): id                           F(  4,     15)     =      7.28
maximum lag: 2                                   Prob > F           =    0.0018
                                                 within R-squared   =    0.0258
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der_c	Drisc/Kraay Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
roa_c	-2.05	1.28012	-1.60	0.130	-4.778512	.6785123
tfa_ta_c	-1.109121	.706852	-1.57	0.137	-2.61574	.3974988
cr_c	-5.850633	1.8652	-3.14	0.007	-9.826214	-1.875053
tax_ebt_c	-.0550513	.0436874	-1.26	0.227	-.1481688	.0380662
_cons	8.07e-07	5.079954	0.00	1.000	-10.82766	10.82767

The regression results for the young firm sub-sample are shown in Table 4. The overall model is statistically significant ($F = 7.28$, $p < 0.01$), indicating that the determinants collectively explain a portion of the variation in leverage.

Among the individual variables, liquidity (Current Ratio) is the only determinant found to have a statistically significant effect. The results show a strong and significant negative relationship between liquidity and leverage (Coef. = -5.85, $p < 0.01$), a finding consistent with the Pecking Order Theory. The other variables—profitability (ROA), asset tangibility, and tax shield—were all found to have no statistically significant relationship with leverage in the young firm group.

A comparison of the regression results reveals different financing patterns across the firm life cycle. The relationship between profitability and leverage is significantly negative for mature firms but insignificant for young firms. Asset tangibility is significant to leverage only for mature firms. Liquidity has a significant negative impact on leverage for both groups, but the effect is larger for young firms (Coef. = -5.85) than for mature firms (Coef. = -0.543). The tax shield was found to be insignificant for both sub-samples. Overall, these results indicate that the firm life cycle systematically moderates the influence of capital structure determinants to firm debt level.

DISCUSSION

The findings of this study indicate that the influence of capital structure determinants varies significantly across the firm life cycle in the Indonesian real estate sector, with results that predominantly support the Pecking Order Theory.

The strongest and most consistent support for the Pecking Order Theory comes from the liquidity variable. A significant negative relationship between liquidity and leverage was found for both young and mature firms. As hypothesized in H7, this effect was substantially stronger for young firms. This highlights that firms in the early stages of their life cycle, who face greater financing constraints, rely more heavily on internal cash and liquid assets to fund their operations and growth, thus aggressively avoiding external debt.

The results for profitability also align with the Pecking Order Theory, but its effect is conditional on the firm's life cycle stage. For mature firms, a significant negative relationship was found, indicating that more profitable firms use less debt, as predicted. For young firms, however, profitability was not a significant determinant. This suggests that the profits of young firms may not be stable or sufficient

enough to be a primary driver of their financing decisions, which are likely dictated by more immediate funding needs.

The findings for asset tangibility and tax shield fail to support the predictions of the Trade-off Theory. The tax shield was insignificant for both groups, which is consistent with a financing model where decisions are driven by the availability of internal funds rather than tax optimization. More notably, the relationship between asset tangibility and leverage was significantly negative for mature firms. This contradicts the prediction that tangible assets should increase debt capacity by serving as collateral. A possible interpretation for this is specific to the Indonesian real estate sector, where fixed assets like land banks may be illiquid or difficult to collateralize optimally, thereby failing to increase a firm's capacity for debt.

CONCLUSION

This study finds that the firm life cycle significantly moderates the relationship between capital structure determinants and leverage in the Indonesian real estate sector. The results show distinct financing patterns between young and mature firms, with findings that predominantly support the Pecking Order Theory. For young firms, financing decisions are strongly driven by liquidity, reflecting high information asymmetry and a reliance on internal funds. For mature firms, the influence of the determinants is different, and some factors behave contrary to traditional theory, underscoring the importance of the sector's unique context. This research contributes to the literature by demonstrating that a firm's developmental stage is a crucial factor in explaining its capital structure decisions

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