THE ROLE OF GROWTH OPPORTUNITIES IN SHAPING CAPITAL STRUCTURE: A COMPARATIVE ANALYSIS OF REAL ESTATE COMPANIES

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ABSTRACT

This study examines how growth opportunities influence capital structure decisions within the real estate sector through the lens of Trade-off and Pecking Order Theory. Using panel data from 58 publicly listed real estate companies (2019-2023), we investigate how growth opportunities affect the relationship between leverage and four determinants: profitability, liquidity, asset tangibility, and tax shield. By segmenting firms into high, medium, and low growth categories, our analysis reveals that profitability negatively affects leverage in both medium and high-growth firms, with stronger effects in high-growth firms, supporting Pecking Order Theory in environments of heightened information asymmetry. Asset tangibility shows a significant negative relationship exclusively in medium-growth firms, reflecting how inventory and land banks serve as potential collateral, though their effectiveness is dampened by information asymmetry in high and low-growth segments. Liquidity demonstrates a significant negative relationship in both high and medium-growth segments, with stronger effects in high-growth firms, while tax shield effects are insignificant across all categories. These findings contribute to capital structure literature by demonstrating how growth opportunities systematically alter traditional capital structure determinants in the real estate sector, offering important implications for corporate financial management.

Keywords: Capital Structure, Real Estate Companies, Growth Opportunities, Asset Tangibility, Property Development, Leverage

1. INTRODUCTION

Capital structure decisions are an important aspect of corporate financial management, that affect firm value and performance (Luo & Jiang, 2022; N., Apriatni, & Youlianto, 2021). Traditional capital structure theories, namely the Trade-off Theory and Pecking Order Theory, provide sometimes competing explanations for financing decisions. The Trade-off Theory suggests firms balance the tax benefits of debt against bankruptcy costs (Myers, 1984), while Pecking Order Theory emphasizes information asymmetry in determining financing hierarchies (Myers & Majluf, 1984). The applicability of these theories may vary significantly across different levels of growth opportunities, as growth rates can fundamentally alter how Trade-off Theory and Pecking Order Theory operate in practice. For example, while Pecking Order Theory predicts a negative relationship between profitability and leverage, this relationship might be weakened in high-growth firms as they require substantial external financing to fund expansion opportunities, regardless of their profitability levels. This moderating role of growth opportunities offers a new perspective in capital structure research, as previous studies usually treated growth as an independent variable of capital structure rather than moderating variable.

This study contributes to the existing literature by examining how growth opportunities moderate the relationship between traditional capital structure determinants and leverage decisions in real estate companies. Four key determinants are examined: profitability, asset tangibility, liquidity, and tax shield. The research is particularly relevant given the unique nature of real estate assets, where inventory (units to be sold) and land banks, although classified as current assets, can serve as potential collateral for debt financing.

This research design segments firms into high, medium, and low growth categories, allowing examination and comparison on how the influence of capital structure determinants varies across different growth profiles. This approach provides insights into how growth opportunities affect the understanding of traditional capital structure theories. The findings of this study have important implications for both theory and practice. For academics, we provide evidence on how growth opportunities can modify traditional capital structure relationships. For practitioners, our results offer insights into how growth opportunities should influence financing decisions in real estate firms.

2. LITERATURE REVIEW

The theories of capital structure are Trade-off Theory and Pecking Order Theory. Trade-off Theory (Modigliani and Miller's, 1963) argues that firms determine their optimal capital structure by balancing the benefits and costs of debt financing. The benefit of debt financing comes from tax shield. The higher the debt, the higher also interest payment. As the interest payment reduces taxable income, the company profits from paying lower level of debt. On the other hand, the higher the debt level, the higher the financial distress and bankruptcy risk faced by the company. The theory suggests that firms trade off the tax advantages of debt against the costs of financial distress and bankruptcy risks (Myers, 1984). Under this framework, firms are expected to maintain a target debt ratio and gradually adjust their capital structure toward this optimal level (Fischer et al., 1989).

In Pecking Order Theory, there is a hierarchical approach companies used to determine financing decisions based on information asymmetry between managers and external investors (Myers & Majluf, 1984). According to this theory, there is information asymmetry between company insider and outsider with company insider has more information compared to outsider. The information asymmetry causes cost when companies seek external financing. Thus, firms choose internal financing over external financing. When external financing is required, firms prefer debt over equity due to lower information asymmetry in debt compared to equity (Shyam-Sunder & Myers, 1999). This preference hierarchy emerges because managers, who are assumed to act in the interest of existing shareholders, are better informed about the firm's prospects than outside investors, creating information asymmetry.

Empirical evidence has provided mixed support for both theories. Frank and Goyal (2003) found that while some firms appear to follow the pecking order predictions, the theory's power has declined over time. Similarly, Graham and Leary (2011) found that firms' financing behaviors often deviate from the strict predictions of the Trade-off Theory, suggesting that neither theory fully explains observed capital structure decisions.

There are four variables used as independent variables to determine debt level in this research. They are Profitability, Liquidity, Asset Tangibility, and Tax Shield. According to Trade-off Theory, higher profit results in higher tax and thus companies can use higher debt to shield them from the higher tax. Higher profitability also reduces financial distress and bankruptcy risk thus enables companies to take more debt (Jensen, 1986). On the other hand, Pecking Order Theory predicts a negative relationship between profitability and leverage. Higher profitability enables firms to use internal funds over external financing to avoid information asymmetry costs (Titman & Wessels, 1988). Asset tangibility has a positive relationship with leverage, as tangible assets can serve as collateral and reduce bankruptcy costs. However, in the real estate sector, this relationship becomes more complex as inventory and land banks, though classified as current assets, can effectively serve as collateral, challenging traditional asset tangibility measures. Liquidity's impact on capital structure decisions is similarly theoretically ambiguous between trade-off theory and pecking order theory. Trade-off Theory suggests that firms with higher liquidity may carry more debt as they can better meet short-term obligations, thus reducing bankruptcy risk and financial distress (Diamond, Hu, & Rajan, 2017). On the other hand, Pecking Order Theory predicts that firms with higher liquidity will borrow less as they have more internal funds available (Ozkan, 2001). The relationship between tax shields and leverage is more straightforward in theoretical terms. According to trade-off theory, firms with higher tax rates will use more debt to gain more tax shield advantage (Graham, 2003).

Under pecking order theory, growth as independent variable is negatively related to debt level (Myers & Majluf, 1984). This is because firm with high growth experience higher information asymmetry, and thus higher cost of debt. Similarly under trade-off theory, firms with high growth opportunities tend to use less debt financing due to higher costs of financial distress and bankruptcy cost (Oliveira & Kayo, 2019). Rajan and Zingales (1995) found the same relation across G-7 countries that firms with higher market-to-book ratios, a proxy for growth opportunities, tend to maintain lower debt levels.

There is research in the context of capital structure where growth is used as moderating variable. McConnell and Servaes (1995) found that growth opportunities alter the relationship between debt level and firm value from positive in low growth firm to negative for high growth

firm. The result suggests similar moderating effects might exist for capital structure determinants.

Hypothesis Development

Based on the theoretical framework and empirical evidence, two sets of hypotheses examining both main effects and the moderating effects of growth opportunities are developed

Main Effect Hypotheses

The relationship between profitability and leverage has been a key point of contention between capital structure theories. Following Pecking Order Theory, which suggests firms prefer internal financing over external debt due to information asymmetry, we hypothesize:

H1a: Profitability has a negative relationship with debt level.

Alternatively, under trade -off theory, highly profitable firm will benefit more from tax shield. Highly profitable firm also has lower risk, enabling higher level of debt

H1b: Profitability has a positive relationship with debt level

Asset tangibility traditionally can act as collateral and reduces bankruptcy costs. Therefore:

H2: Asset tangibility has a positive relationship with debt level.

Liquidity represents the availability of internal funds. Following Pecking Order Theory's preference for internal financing:

H3: Liquidity has a negative relationship with debt level.

Based on Trade-off Theory, firms with higher tax shields benefit more from debt financing:

H4: Tax shield has a positive relationship with debt level.

Moderating Effect Hypotheses

Growth opportunities can significantly alter these relationships through various mechanisms. For profitability, high growth firms may require external financing regardless of their profitability levels:

H5a: Growth opportunities weaken the negative relationship between profitability and debt level.

In case trade-off theory dominates the relation between profitability and debt level, the relation between profitability and debt level is negative. High growth firm requires more financing compared to low growth firm.

H5b: Growth opportunities strengthen the positive relationship between profitability and debt level.

For asset tangibility, the effectiveness of inventory and land banks as collateral may vary with growth levels due to associated risks:

> H6: Growth opportunities weaken the positive relationship between asset tangibility and debt level.

High-growth firms may need to maintain liquidity for operational flexibility while simultaneously seeking debt financing:

> H7: Growth opportunities weaken the negative relationship between liquidity and debt level.

Growing firms with substantial tax shields may find debt financing even more attractive:

> H8: Growth opportunities strengthen the positive relationship between tax shield and debt level.

3. RESEARCH METHOD

Sample Selection
This study examines real estate companies listed on the Indonesian Stock Exchange (IDX) over the period 2019-2023. The real estate sector in Indonesia provides an interesting setting for examining capital structure decisions due to its rapid growth and development in recent years. The initial sample includes all real estate companies listed on IDX during the study period.

Following prior literature and considering the specific requirements of our research variables, we apply several screening criteria to our sample selection. Most notably, we include only companies with positive net income throughout the sample period. This restriction is necessary as tax shield effects, one of our key variables of interest, are only relevant for profitable firms. Companies with negative income do not benefit from the tax deductibility of interest payments, which could distort our analysis of tax shield effects on capital structure decisions. The final sample consists of 58 companies over 5 years (2019-2023).

Variable Measurement
Our study employs the following measurements for dependent, independent, and moderating variables:

Dependent Variable The debt level is measured using the Debt to Equity Ratio (DER), calculated as: DER=Total Liability/Total Equity.

Independent Variables:

- Profitability is measured using Return on Assets (ROA): ROA=Net Income/Total Assets.
- Asset Tangibility is calculated as: Fixed Assets/Total Assets.
- Liquidity is measured using the Current Ratio (CR): CR=Current AssetsCurrent Liabilities

- Tax Shield is measured using the Effective Tax Rate (ETR): ETR=Tax Expense/Earning Before Tax

Moderating Variable

Growth (GROWTH) is measured as the percentage change in fixed assets: GROWTH=FA(t)−FA(t−1)/FA(t−1) where FA(t) represents fixed assets in year t.

Based on this growth measure, we categorize firms into three groups:

- High Growth: firms in the top tercile
- Medium Growth: firms in the middle tercile
- Low Growth: firms in the bottom tercile

Data Analysis

Our empirical analysis employs panel data regression techniques using Stata statistical software. The analysis proceeds through several systematic steps to ensure robust results.

First, we conduct specification tests to determine the appropriate panel estimation method. We employ three standard specification tests:

- The Chow test examines whether the Fixed Effects model is more appropriate than Pooled Least Squares (PLS)
- The Breusch-Pagan Lagrange Multiplier (LM) test determines whether the Random Effects model is more appropriate than PLS
- The Hausman test helps choose between Fixed Effects and Random Effects models

Before proceeding with the regression analysis, we conduct several diagnostic tests namely multicollinearity, heteroscedasticity, and autocorrelation. Based on these diagnostic results, if no violations of assumptions are detected, we proceed with standard panel regression using the 'xtreg' command in Stata. If heteroscedasticity or autocorrelation is present, we employ cluster-robust standard errors at the firm level using the 'cluster(id)' option to address these issues

We conduct four separate regression analyses:

- Full sample regression to examine the main effects across all firms
- High-growth subsample regression (top tercile)
- Medium-growth subsample regression (middle tercile)
- Low-growth subsample regression (bottom tercile)

The regression model for each sample takes the following form: $DER = \beta_0 + \beta_1 ROA + \beta_2 TANGIBILITY + \beta_3 CR + \beta_4 ETR + \varepsilon$

4. RESULT AND DISCUSSION

Descriptive Statistic

Table 1: Descriptive Statistic

		ROA	Asset Tangibility	Current Ratio	Tax Shield	DER	Fix Asset Growth
All samples	**Average**	0.6%	0.63	2.80	0.13	0.77	1.02
	Minimum	-18.4%	0.00	0.03	-3.78	-3.75	0.00
	Maximum	20.0%	0.99	14.47	6.99	4.99	2.21
	STD	5.2%	0.23	2.54	0.66	0.84	0.14
High Growth Firms	**Average**	2.9%	0.58	2.90	0.23	0.84	1.13
	Minimum	-14.2%	0.00	0.28	-0.76	0.01	1.03
	Maximum	18.9%	0.94	13.18	6.99	3.79	2.21
	STD	4.6%	0.23	2.43	0.77	0.81	0.16
Medium Growth Firms	**Average**	0.9%	0.64	3.06	0.16	0.66	1.01
	Minimum	-10.5%	0.00	0.15	-0.60	0.02	0.99
	Maximum	18.0%	0.98	14.47	3.54	3.15	1.03
	STD	4.2%	0.25	2.83	0.49	0.65	0.01
Low Growth Firms	**Average**	-2.0%	0.69	2.44	0.00	0.81	0.93
	Minimum	-18.4%	0.18	0.03	-3.78	-3.75	0.00
	Maximum	20.0%	0.99	11.73	3.02	4.99	0.99
	STD	5.6%	0.20	2.31	0.66	1.01	0.11

Notes: DER = Debt to Equity Ratio (Total Liability/Total Equity) ROA = Return on Assets (Net Income/Total Assets) Asset Tangibility = (Fixed Assets/Total Assets) FA GROWTH = Growth Rate of Fixed Assets ((FAt - FAt-1)/FAt-1) Current Ratio = (Current Assets/Current Liabilities) Tax Shield = Effective Tax Rate (Tax Expense/Earnings Before Tax)

Regression Result

		All Samples	High Growth	Medium Growth	Low Growth
	Within R-squared	0.063	0.104	0.216	0.135
	Between R-squared	0.252	0.443	0.230	0.006
	Overall R-squared	0.190	0.375	0.240	0.025
	F-statistic	0.01	0.02	0.04	0.30
Profitability	Coefficient:	-1.23	-2.60	-1.36	-0.44
	Statistical Significance	0.20	0.03	0.33	0.80
Asset Tangibility	Coefficient:	-1.27	-0.65	-0.79	-0.10
	Statistical Significance	0.10	0.40	0.03	0.84
Liquidity	Coefficient:	-0.04	-0.04	-0.03	-0.05
	Statistical Significance	0.00	0.02	0.00	0.24
Tax Shield	Coefficient:	0.20	0.41	0.00	-0.84
	Statistical Significance	0.43	0.84	0.55	0.06

Discussion

Our empirical results provide several interesting insights into how growth opportunities moderate capital structure determinants in Indonesian real estate companies. The explanatory power of our model, as indicated by R-squared values, shows an increasing trend from low growth to high growth samples. This pattern suggests that traditional capital structure determinants become more relevant as growth opportunities increase. Furthermore, the F-statistics indicate that our model is statistically significant for the full sample, high growth, and medium growth subsamples, but not for the low growth subsample, highlighting the differential impact of growth opportunities on capital structure decisions based on growth.

The relationship between profitability and leverage provides strong support for Pecking Order Theory. We find a significant negative relationship in both medium growth and high growth subsamples, with the effect being stronger in the high growth segment. The stronger negative relationship between profitability and leverage in high-growth firms can be explained through the lens of information asymmetry and Pecking Order Theory. High-growth firms typically engage in new projects, expansion activities, and development of new properties, making it more difficult for outside investors to accurately assess the true value and risk of these future opportunities. This increased information asymmetry arises because managers possess superior information about the quality and potential returns of growth opportunities, while external investors face greater uncertainty in evaluating these prospective investments. According to Pecking Order Theory, when information asymmetry is high, firms prefer to avoid external financing as the market may undervalue their securities, leading them to rely more heavily on internal funds generated through profits. Consequently, high-growth firms with higher profitability demonstrate an even stronger tendency to avoid debt financing compared to medium-growth firms, as reflected in the larger negative coefficient because they face both higher information asymmetry and have more internal funds available through their profits.

Asset tangibility shows an interesting departure from traditional capital structure predictions. We find a significant negative relationship with leverage in the medium growth subsample but no significant relationship in high and low growth subsamples. This unexpected negative relationship can be attributed to the unique nature of real estate firms' assets, where housing units and land banks, although classified as current assets in inventory, can be used as collateral. The insignificant relationship in high and low growth segments suggests that information asymmetry effects may overshadow the collateral effect of tangible assets in these contexts. In high-growth firms, information asymmetry stems from the uncertainty surrounding new projects and expansion activities, while in low-growth firms, it arises from concerns about stagnation and potential financial distress, making it difficult for external investors to accurately value the firms' assets as collateral. This "U-shaped" pattern of information asymmetry, where both high and low growth firms face greater information problems than medium-growth firms, explains why the relationship between asset tangibility and leverage is only significant in the medium growth segment.

Liquidity demonstrates a significant negative relationship with leverage in both medium growth and high growth subsamples, with a stronger effect in the high growth segment. This finding aligns with Pecking Order Theory, suggesting that firms with higher liquidity prefer internal funding over debt, as internal funds avoid the costs associated with information asymmetry in external financing. The stronger effect in high-growth firms indicates that growth opportunities amplify the preference for internal funding, possibly due to increased information asymmetry concerns. This amplification occurs because high-growth firms face greater scrutiny from external investors who may have difficulty evaluating the true value of growth opportunities, making external financing more costly. Additionally, high-growth firms may maintain higher liquidity levels strategically to ensure funding availability for future investment opportunities, further strengthening their ability and preference to use internal funds over debt financing.

Notably, tax shield effects are insignificant across all growth categories, suggesting that Trade-off Theory's predictions regarding tax benefits of debt may not be applicable in the Indonesian real estate sector.

5. CONCLUSION

This study examines how growth opportunities moderate the relationship between capital structure determinants and leverage decisions in Indonesian real estate companies from 2019 to 2023. Our findings provide several important contributions to capital structure literature and offer practical insights for financial managers in the real estate sector.

First, we find strong evidence that growth opportunities significantly influence the effectiveness of traditional capital structure determinants, as demonstrated by the increasing explanatory power of our model across growth categories. This finding suggests that conventional capital structure theories become more relevant as firms' growth opportunities increase, particularly in explaining financing decisions of high-growth firms.

Second, our results predominantly support Pecking Order Theory over Trade-off Theory in the Indonesian real estate context. The significant negative relationships between both profitability and liquidity with leverage, particularly in high-growth firms, indicate that information asymmetry plays a crucial role in financing decisions. This effect is amplified in high-growth firms where the uncertainty surrounding new projects and expansion activities makes external financing more costly.

Third, we document an interesting departure from traditional capital structure theory regarding asset tangibility. The negative relationship between tangibility and leverage in medium-growth firms, coupled with insignificant relationships in high and low growth segments, highlights the unique nature of real estate firms' assets and the complex interplay between growth opportunities and information asymmetry. This finding suggests that conventional assumptions about collateral value may need reconsideration in the real estate sector context.

These findings have important implications for financial managers and investors in the real estate sector. Managers should consider their firm's growth position when making financing decisions, as the effectiveness of traditional capital structure determinants varies significantly across growth categories. For investors and lenders, our results suggest that evaluation of real estate firms' financing decisions should account for both growth opportunities and the unique nature of real estate assets as collateral.

APPENDIX

ALL SAMPLES

Chow test

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. xtreg der profitability assettangibility liquidity taxshield, fe

Fixed-effects (within) regression               Number of obs      =       266
Group variable: id                              Number of groups   =        58

R-sq:                                           Obs per group:
     within  = 0.0630                                         min =         1
     between = 0.2521                                         avg =       4.6
     overall = 0.1902                                         max =         5

                                                F(4,204)           =      3.43
corr(u_i, Xb)  = 0.1463                         Prob > F           =    0.0097

------------------------------------------------------------------------------
         der |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
profitability |   -1.23122    1.03016    -1.20   0.233    -3.262346    .7999052
assettangibility |  -1.266652   .4303719   -2.94   0.004   -2.115199   -.4181047
   liquidity |  -.0429087   .0241302    -1.78   0.077    -.0904853    .0046679
   taxshield |   .2033075   .1208226     1.68   0.094    -.0349137    .4415286
       _cons |   1.676171   .3032627     5.53   0.000     1.07824    2.274103
-------------+----------------------------------------------------------------
     sigma_u |  .68661298
     sigma_e |  .44225729
         rho |  .70677205   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(57, 204) = 8.56                     Prob > F = 0.0000
```

Hausman test

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. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    fixed       random       Difference          S.E.
-------------+------------------------------------------------------------
profitabil~y |   -1.23122    -1.674888       .4436679        .4931366
assettangi~y |  -1.266652    -1.495837       .2291851        .3056671
   liquidity |  -.0429087    -.0758579       .0329492        .0114943
   taxshield |   .2033075     .1750841       .0282234        .0287525
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          9.54
                Prob>chi2 =        0.0489
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Uji Multikolinearitas

```
. reg der profitability assettangibility liquidity taxshield

      Source |       SS           df       MS      Number of obs   =       266
-------------+----------------------------------   F(4, 261)       =     24.10
       Model |  49.9747142         4  12.4936786   Prob > F        =    0.0000
    Residual |  135.288135       261  .518345344   R-squared       =    0.2698
-------------+----------------------------------   Adj R-squared   =    0.2586
       Total |  185.262849       265  .69910509    Root MSE        =    .71996

------------------------------------------------------------------------------
         der |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
profitability |  -3.171857   .8625306    -3.68   0.000    -4.870262   -1.473453
assettangibility |  -1.768691   .2195505   -8.06   0.000   -2.201006   -1.336375
   liquidity |  -.1423608   .0197495    -7.21   0.000    -.1812494   -.1034722
   taxshield |   .1988028   .1534383     1.30   0.196    -.1033318    .5009374
       _cons |   2.286232   .1793002    12.75   0.000     1.933173    2.639291
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
assettangi~y |      1.30    0.767418
   liquidity |      1.30    0.768144
profitabil~y |      1.06    0.941129
   taxshield |      1.04    0.959545
-------------+----------------------
    Mean VIF |      1.18
```

Uji Hetero

Uji Autokorelasi

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. xtserial der profitability assettangibility liquidity taxshield

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
     F(  1,       49) =    242.446
           Prob > F =      0.0000
```

Hasil regresi

```
. xtreg der profitability assettangibility liquidity taxshield, fe cluster(id)

Fixed-effects (within) regression               Number of obs     =       266
Group variable: id                              Number of groups  =        58

R-sq:                                           Obs per group:
     within  = 0.0630                                         min =         1
     between = 0.2521                                         avg =       4.6
     overall = 0.1902                                         max =         5

                                                F(4,57)           =      3.95
corr(u_i, Xb)  = 0.1463                         Prob > F          =    0.0067

                                    (Std. Err. adjusted for 58 clusters in id)
------------------------------------------------------------------------------
             |               Robust
         der |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  profitability |  -1.23122   .9545861    -1.29   0.202    -3.142746    .6803054
assettangibility |  -1.266652   .7654078    -1.65   0.103    -2.799355    .2660506
   liquidity |  -.0429087   .0142843    -3.00   0.004    -.0715125   -.0143049
   taxshield |   .2033075    .256481     0.79   0.431    -.3102869    .7169018
       _cons |   1.676171   .4924217     3.40   0.001     .6901141    2.662229
-------------+----------------------------------------------------------------
     sigma_u |  .68661298
     sigma_e |  .44225729
         rho |  .70677205   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

HIGH GROWTH

Chow test

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. xtreg der profitability assettangibility liquidity taxshield, fe

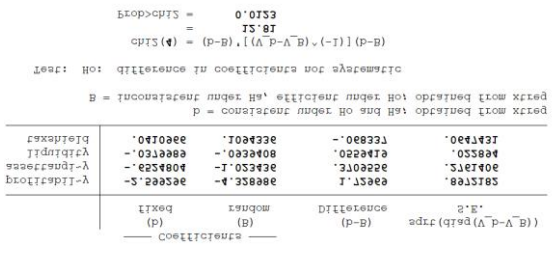
Fixed-effects (within) regression               Number of obs     =        90
Group variable: id                              Number of groups  =        41

R-sq:                                           Obs per group:
     within  = 0.1040                                         min =         1
     between = 0.4431                                         avg =       2.2
     overall = 0.3746                                         max =         4

                                                F(4,45)           =      1.31
corr(u_i, Xb)  = 0.4495                         Prob > F          =    0.2824

------------------------------------------------------------------------------
         der |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  profitability |  -2.599296   1.592589    -1.63   0.110    -5.806935    .608343
assettangibility |  -.6524804   .4426509    -1.47   0.147    -1.544025   .2390642
   liquidity |  -.0379989   .0395279    -0.96   0.342     -.117612   .0416143
   taxshield |   .0410966   .1920107     0.21   0.831    -.3456329    .427826
       _cons |    1.40194   .3202117     4.38   0.000     .7570007    2.04688
-------------+----------------------------------------------------------------
     sigma_u |  .74178441
     sigma_e |  .28818194
         rho |  .86886191   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(40, 45) = 9.01                     Prob > F = 0.0000
```

Hausman test



Uji multikolinearitas

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. reg der profitability assettangibility liquidity taxshield
```

Source	SS	df	MS	Number of obs	=	90
				F(4, 85)	=	15.84
Model	25.0851284	4	6.27128211	Prob > F	=	0.0000
Residual	33.6553606	85	.395945419	R-squared	=	0.4271
				Adj R-squared	=	0.4001
Total	58.7404891	89	.660005495	Root MSE	=	.62924

der	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
profitability	-6.085807	1.472709	-4.13	0.000	-9.013946	-3.157667
assettangibility	-1.452504	.334422	-4.34	0.000	-2.117424	-.7875832
liquidity	-.1511525	.0320256	-4.72	0.000	-.2148279	-.087477
taxshield	.3730846	.2516108	1.48	0.142	-.127185	.8733542
_cons	2.238236	.2656559	8.43	0.000	1.710041	2.766431

```
. vif
```

Variable	VIF	1/VIF
liquidity	1.38	0.725184
assettangi~y	1.27	0.785982
taxshield	1.08	0.924817
profitabil~y	1.05	0.953163
Mean VIF	1.20	

Uji hetero

```
. reg der profitability assettangibility liquidity taxshield
```

Source	SS	df	MS	Number of obs	=	90
				F(4, 85)	=	15.84
Model	25.0851284	4	6.27128211	Prob > F	=	0.0000
Residual	33.6553606	85	.395945419	R-squared	=	0.4271
				Adj R-squared	=	0.4001
Total	58.7404891	89	.660005495	Root MSE	=	.62924

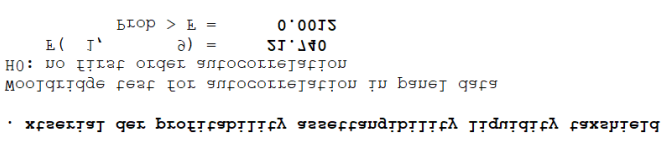
der	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
profitability	-6.085807	1.472709	-4.13	0.000	-9.013946	-3.157667
assettangibility	-1.452504	.334422	-4.34	0.000	-2.117424	-.7875832
liquidity	-.1511525	.0320256	-4.72	0.000	-.2148279	-.087477
taxshield	.3730846	.2516108	1.48	0.142	-.127185	.8733542
_cons	2.238236	.2656559	8.43	0.000	1.710041	2.766431

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of der

         chi2(1)      =    28.52
         Prob > chi2  =   0.0000
```

Uji autokorelasi



Hasil regresi

```
. xtreg der profitability assettangibility liquidity taxshield, fe cluster(id)

Fixed-effects (within) regression               Number of obs      =        90
Group variable: id                              Number of groups   =        41

R-sq:                                           Obs per group:
     within  = 0.1040                                         min =         1
     between = 0.4431                                         avg =       2.2
     overall = 0.3746                                         max =         4

                                                F(4,40)           =      3.27
corr(u_i, Xb)  = 0.4495                         Prob > F          =    0.0206

                                    (Std. Err. adjusted for 41 clusters in id)
------------------------------------------------------------------------------
             |               Robust
         der |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
profitability |  -2.599296   1.171644    -2.22   0.032    -4.967277   -.2313146
assettangibility |  -.6524804   .7736075    -0.84   0.404    -2.215999    .9110386
   liquidity |  -.0379989   .0154664    -2.46   0.018    -.0692577    -.00674
   taxshield |   .0410966     .19912     0.21   0.838      -.36134    .4435331
       _cons |    1.40194   .4818198     2.91   0.006     .4281462    2.375734
-------------+----------------------------------------------------------------
     sigma_u |  .74178441
     sigma_e |  .28818194
         rho |  .86886191   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

MEDIUM GROWTH

```
. xtreg der profitability assettangibility liquidity taxshield, fe

Fixed-effects (within) regression               Number of obs      =        89
Group variable: id                              Number of groups   =        48

R-sq:                                           Obs per group:
     within  = 0.2161                                         min =         1
     between = 0.2295                                         avg =       1.9
     overall = 0.2395                                         max =         4

                                                F(4,37)           =      2.55
corr(u_i, Xb)  = 0.2500                         Prob > F          =    0.0553

------------------------------------------------------------------------------
         der |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
profitability |  -1.36225   1.262142    -1.08   0.287    -3.919593    1.195093
assettangibility |  -.7875898    .263466    -2.99   0.005    -1.321423   -.2537571
   liquidity |  -.0259885   .0113252    -2.29   0.028    -.0489355   -.0030414
   taxshield |   .0245799   .0554345     0.44   0.660    -.0877411    .1369008
       _cons |   1.253507   .1927681     6.50   0.000     .8629218    1.644092
-------------+----------------------------------------------------------------
     sigma_u |  .68396213
     sigma_e |  .10025655
         rho |  .97896566   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(47, 37) = 52.12                     Prob > F = 0.0000
```

Uji Hausman

```
. hausman fixed random, sigmaless

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
profitabil~y |   -1.36225    -2.186581        .8243313        .6595921
assettangi~y |  -.7875898    -.9630067        .1754168        .1357323
   liquidity |  -.0259885     -.035591        .0096025        .0040771
   taxshield |   .0245799     .0300722       -.0054923        .0114723
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       10.27
                Prob>chi2 =      0.0361
```

Uji multikol

```
. vif
```

Variable	VIF	1/VIF
assettangi~y	1.41	0.707696
liquidity	1.37	0.730683
taxshield	1.05	0.955321
profitabil~y	1.04	0.963379
Mean VIF	1.22	

Uji auto hetero

```
. reg der profitability assettangibility liquidity taxshield
```

Source	SS	df	MS	Number of obs	=	89
				F(4, 84)	=	10.15
Model	12.0760857	4	3.01902141	Prob > F	=	0.0000
Residual	24.9964757	84	.297577092	R-squared	=	0.3257
				Adj R-squared	=	0.2936
Total	37.0725614	88	.421279106	Root MSE	=	.54551

der	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
profitability	-4.021128	1.374091	-2.93	0.004	-6.753659	-1.288598
assettangibility	-1.49295	.2793489	-5.34	0.000	-2.048466	-.9374343
liquidity	-.1117474	.0239524	-4.67	0.000	-.1593794	-.0641154
taxshield	.0923391	.1743944	0.53	0.598	-.2544634	.4391416
_cons	1.982597	.2356872	8.41	0.000	1.513907	2.451287

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of der

         chi2(1)      =    21.38
         Prob > chi2  =   0.0000
```

Uji autokorelasi

```
. xtserial der profitability assettangibility liquidity taxshield

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
     F(  1,        5) =      1.877
               Prob > F =      0.2289
```

Hasil regresi

```
. xtreg der profitability assettangibility liquidity taxshield, fe robust

Fixed-effects (within) regression               Number of obs     =        89
Group variable: id                              Number of groups  =        48

R-sq:                                           Obs per group:
     within  = 0.2161                                         min =         1
     between = 0.2295                                         avg =       1.9
     overall = 0.2395                                         max =         4

                                                F(4,47)           =      2.72
corr(u_i, Xb)  = 0.2500                         Prob > F          =    0.0405

                                    (Std. Err. adjusted for 48 clusters in id)
```

der	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
profitability	-1.36225	1.378538	-0.99	0.328	-4.13551	1.411011
assettangibility	-.7875898	.3403632	-2.31	0.025	-1.472312	-.1028674
liquidity	-.0259885	.0085604	-3.04	0.004	-.0432098	-.0087671
taxshield	.0245799	.0403365	0.61	0.545	-.0565666	.1057263
_cons	1.253507	.2328121	5.38	0.000	.7851496	1.721865
sigma_u	.68396213					
sigma_e	.10025655					
rho	.97896566	(fraction of variance due to u_i)				

LOW GROWTH

Chow test

```
. xtreg der profitability assettangibility liquidity taxshield, fe

Fixed-effects (within) regression               Number of obs      =        87
Group variable: id                              Number of groups   =        45

R-sq:                                           Obs per group:
     within  = 0.1353                                         min =         1
     between = 0.0059                                         avg =       1.9
     overall = 0.0246                                         max =         5

                                                F(4,38)            =      1.49
corr(u_i, Xb)  = -0.0871                        Prob > F           =    0.2254

------------------------------------------------------------------------------
         der |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
profitability |  -.4383588   1.920636    -0.23   0.821    -4.326484    3.449766
assettangibility |  -.1026629   1.389458    -0.07   0.941    -2.915473    2.710147
   liquidity |  -.0496042   .0710643    -0.70   0.489    -.1934664     .094258
   taxshield |  -.8360906   .3860454    -2.17   0.037    -1.617599   -.0545826
       _cons |   1.017987   .9997642     1.02   0.315    -1.00593    3.041904
-------------+----------------------------------------------------------------
     sigma_u |  1.1262152
     sigma_e |   .41702564
         rho |   .87941907   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(44, 38) = 8.17                     Prob > F = 0.0000
```

Hausman test

```
. hausman fixed random

                 ---- Coefficients ----
                 (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
                 fixed        random       Difference          S.E.
-------------------------------------------------------------------------------
profitabil~y    -.4383588     .1389153      -.5772741        1.061017
assettangi~y    -.1026629    -1.807955       1.705292        1.214835
   liquidity    -.0496042    -.0949338       .0453296        .0503948
   taxshield    -.8360906    -.6610394      -.1750512        .1838734
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        3.66
                Prob>chi2 =      0.4534
```

Multikol test

```
. reg der profitability assettangibility liquidity taxshield

      Source |       SS           df       MS      Number of obs   =        87
-------------+----------------------------------   F(4, 82)        =      5.55
       Model |  18.7150446         4  4.67876115   Prob > F        =    0.0005
    Residual |  69.1047618        82  .842740998   R-squared       =    0.2131
-------------+----------------------------------   Adj R-squared   =    0.1747
       Total |  87.8198064        86  1.02116054   Root MSE        =    .91801

------------------------------------------------------------------------------
         der |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
profitability |  -.2919271   1.891373    -0.15   0.878    -4.054471    3.470617
assettangibility |  -2.331447   .5366638    -4.34   0.000    -3.399042   -1.263852
   liquidity |  -.1540496   .0466652    -3.30   0.001    -.2468816   -.0612177
   taxshield |  -.0993965   .4284075    -0.23   0.817    -.9516355    .7528426
       _cons |   2.775672   .4372185     6.35   0.000     1.905905    3.645438
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
   liquidity |      1.22    0.822260
assettangi~y |      1.22    0.822361
profitabil~y |      1.18    0.846817
   taxshield |      1.17    0.857424
-------------+----------------------
    Mean VIF |      1.19
```

Hetero test

```
. reg der profitability assettangibility liquidity taxshield
```

Source	SS	df	MS		
Model	18.7150446	4	4.67876115	Number of obs	87
Residual	69.1047618	82	.842740998	F(4, 82)	5.55
				Prob > F	0.0005
Total	87.8198064	86	1.02116054	R-squared	0.2131
				Adj R-squared	0.1747
				Root MSE	.91801

der	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
profitability	-.2919271	1.891373	-0.15	0.878	-4.054471	3.470617
assettangibility	-2.331447	.5366638	-4.34	0.000	-3.399042	-1.263852
liquidity	-.1540496	.0466652	-3.30	0.001	-.2468816	-.0612177
taxshield	-.0993965	.4284075	-0.23	0.817	-.9516355	.7528426
_cons	2.775672	.4372185	6.35	0.000	1.905905	3.645438

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of der

         chi2(1)      =     9.01
         Prob > chi2  =   0.0027
```

Auto test

```
. xtserial der profitability assettangibility liquidity taxshield

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
     F(  1,        5) =    287.525
           Prob > F =      0.0000
```

Hasil regresi

```
. xtreg der profitability assettangibility liquidity taxshield, fe cluster(id)

Fixed-effects (within) regression               Number of obs     =        87
Group variable: id                              Number of groups  =        45

R-sq:                                           Obs per group:
     within  = 0.1353                                         min =         1
     between = 0.0059                                         avg =       1.9
     overall = 0.0246                                         max =         5

                                                F(4,44)           =      1.26
corr(u_i, Xb)  = -0.0871                        Prob > F          =    0.3018

                                    (Std. Err. adjusted for 45 clusters in id)
```

der	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
profitability	-.4383588	1.714383	-0.26	0.799	-3.893471	3.016753
assettangibility	-.1026629	.4886857	-0.21	0.835	-1.087544	.8822184
liquidity	-.0496042	.0412674	-1.20	0.236	-.1327733	.0335649
taxshield	-.8360906	.4250441	-1.97	0.056	-1.692711	.0205294
_cons	1.017987	.3471465	2.93	0.005	.3183595	1.717615
sigma_u	1.1262152					
sigma_e	.41702564					
rho	.87941907	(fraction of variance due to u_i)				

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