The Determinants Of Capital Structure: Trade-Off Theory Vs Pecking Order Theory

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Abstract. This paper aims to examine the determinants of capital structure based on the views of the trade-off theory and the pecking order theory. A hundred and three companies were observed 618 times, differentiated for companies using debt below and above 50% and applying multiple regression to find out the determinants of capital structure in manufacturing companies in Indonesia from 2011 to 2017. The results of the study prove that there are differences in the determinants of capital structure when viewed from the trade-off and pecking order theories. Companies that use a debt proportion of <50% are theoretically more following the pecking order theory, and companies that use a debt proportion of ≥ 50% are theoretically more suitable with the trade-off theory. But, in companies that use a debt proportion of <50%, three variables produce coefficients that match predictions (Firm Age, Profitability, and Liquidity), and three variables do not match the predicted direction (Firm Size, Debt tax shield, and Business Risk). One variable is not significant (Growth). These results indicate that sample companies that are more mature, more liquid, and more profitable tend to prioritize internal sources of funds in financing company activities, so they use a lower proportion of debt in their capital structure, in line with the view of the pecking order theory. But on the other hand, the larger the size of the company, which has a certainty of profit (low business risk) tends to take advantage of the tax advantages of debt by increasing the proportion of debt in its capital structure, more in line with the trade-off theory. In companies that use a debt proportion of ≥ 50%, only one variable produces a coefficient that follows predictions (Firm Age), and four variables are not following the prediction direction (Firm Size, Profitability, Business Risk, and Liquidity). Two variables are not significant (Debt tax shield and growth). These results indicate that more mature sample firms tend to use lower debt which is more in line with the trade-off theory. On the other hand, the larger the company's size, the more profitable it has a certainty of profit and is more liquid; it tends to use a lower proportion of debt in its capital structure, more in line with the pecking order theory.

Keywords: Determinants Capital Structure, The Trade-Off Theory, The Pecking Order Theory.

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1 Introduction

Modern finance theory is missing something important regarding corporate debt policy. Current theory can't explain why a company chose its capital structure composition [1]. Myers (1984) said we don't know enough about capital structure. We don't know how companies decide whether to issue debt, equity, or a mix of the two. Also, Thies & Klock (1992) said that capital structure is one of the most controversial financial topics. Since Modigliani and Miller wrote about it in 1958, academics worldwide have been interested in studying capital structure. Over the last 50 years, many studies have been done to determine how a business's capital structure affects its value, how businesses choose their capital structure, and how much to borrow based on the benefits and costs of borrowing.

In addition, Modigliani & Miller (1963) claimed that debt affects corporate value, suggesting that a greater debt load signals higher corporate value, encouraging firms to increase their debt levels. This idea has been panned for not taking into account the company's risks due to its rising debt levels. Later, this tactic was characterized by the concept of "tax savings versus financial expenses" (or "the trade-off idea"). Capital structure ratios that maximize returns while minimizing the risk of insolvency are determined by applying the principles of trade-off theory [5].

Continuing our exploration of capital structure hypotheses, we will discuss the Pecking Order Hypothesis. In 1963, Harvard Business School's Research Division published the findings of a study by Gordon Donaldson in which he analyzed data from 500 companies included in the Fortune 500. This research shows that a company's financing cycle begins with retained earnings, moves on to indebtedness to other parties via loan or bond sales, and ends with the issuance of new shares (Donaldson, 1963).

Also, firms prefer to finance securities offering events with debt and equity from within the company (Myers, 1984). Asymmetric information problems are what the theory of pecking order is based on. The business itself may pay for investments. So, using outside financing means that debt is more important than equity. Also, Myers & Majluf (1984) said that the issue of safe securities is usually better than the issue of risky securities. Firms should look for outside capital on the bond market, but if they can, they should also try to raise equity through retention. That is, debt financing from outside is better than equity financing.

Corporate size is a frequently postulated indicator of financial leverage, according to Schoubben & Van Hulle (2004). Most capital structure models account for scale and financial leverage. Size and leverage were first positively correlated by Schwartz & Van Tassel (1950). Large firms have a better ability to pay interest, are more diversified, have higher collateral values, and are less likely to go bankrupt than small ones, supporting the positive linearity argument. Pandey (2004) uses the log of assets to estimate the business size. Riportella & Papis (2001) use sales, assets, and employees as proxies for business size and argue that firm size is positively connected with firm

leverage because large firms can satisfy interest payments, are more diversified, and are more profitable.

On the other hand, Rajan & Zingales (1995) show that a company's size has a negative effect on its debt level because large companies prefer to finance themselves with equity instead of debt. So, smaller and younger companies pay fewer dividends because they focus more on debt and investments than bigger companies (Cooley & Quadrini, 2001). The link between firm size and debt is negative because big companies have easier access to equity investments than small companies [14]–[17].

Leverage for a company is also affected by how old the firm is. Kieschnick & Moussawi (2018) say that a firm's use of debt is linked to its age, even without considering how it interacts with other parts of corporate governance. Several other researchers have also found a negative link between the age of a company and its debt [19], [20]. In general, the researcher thinks the research results show that as managers get older, they can let their risk preferences have a bigger say in how their company's capital structure is set up [18], [21], [22]

Another factor that affects capital structure is profitability. Kumar et al. (2017) say that profitability is one of the most important factors in the research on capital structure. Leverage has a negative effect on overall profits. When the relationship is looked at separately in different parts of the world, it is found to be inversely proportional to leverage. This statement explains why corporations usually invest their own money, such as retained earnings and owner's equity. Researchers in the past have found that debt and profit are linked in a bad way [12], [17], [24]–[26].

On the other hand, a number of researchers found a positive link between profit and debt [27]–[29]. The main things determining the optimal capital ratio are taxes and the costs of financial trouble (Berger et al., 1995). The trade-off theory says that debt and effective tax rates will have a positive relationship. So, a high tax rate makes the tax benefits of interest on debt bigger. Trade-off theory says that firms will use more debt when the tax rate is higher to benefit from higher interest taxes [26]. Also, Rasiah & Kim (2011) said that the biggest reason companies take on more debt is the tax shield that comes from paying interest on the debt instead of taxes. According to the pecking order theory, corporate debt is related to the effective tax rate in a bad way because a higher effective tax rate will cut the company's internal funds from profits and raise its cost of capital [31].

In the academic literature, a company's capital structure is mostly based on its business's risk [32], [33]. Evidence shows no clear link between business risk and capital structure. Research shows that the two have an inverse relationship [34]–[39]. Several other scientists have also found a possible link between the two [40]–[42]. In their research, Titman & Wessels (1988) found no significant link between the two. On the other hand, different researchers have found a positive link between business risk and capital structure costs, which goes against the idea that reducing business risk increases capital structure costs [1], [43].

Organizations with high development potential also typically have low debt levels, according to Myers (2001). Numerous other researchers who found a negative association between growth and company leverage have confirmed this finding [45]–[48].

In various prior research, liquidity has also been noted as a factor influencing capital structure [23]. According to Jensen (1986), there is a positive association between liquidity and cash-rich firms' decision to take on new debt to prevent management from wasting free cash flows. Several researchers support this conclusion [35], [50]. However, the preponderance of empirical evidence suggests that the relationship between liquidity and debt ratios is inverse [12], [14], [17], [39], [51]–[53].

2 Literature Review

2.1 Theories and Hypotheses Development-Based Capital Structure

It has been argued that the impact of financing on the firm's value is irrelevant since Modigliani and Miller's 1958 article "The Cost of Capital, Corporation Finance, and the Theory of Investment", which made several limiting assumptions. The topic of capital structure has drawn the attention of academics around the world. Over the past 50 years, several studies have been conducted to clarify the relationship between capital structure and firm value, how organizations choose their capital structure, and how much debt is appropriate, given the advantages and disadvantages of borrowing. The beginnings and development of corporate leverage are attempted to be explained by three main hypotheses.

The first hypothesis is the traditional (or static) trade-off theory. By comparing the tax advantages of debt, the costs of bankruptcy, and the expenses of debt and equity agency, this theory explains how a corporation determines the ideal level of debt and strives to alter its existing debt level toward the optimal point [1], [4], [35].

Pecking order is the second hypothesis [2], [7], [54]. The corporation funds itself internally, through debt, and with stockholder equity due to information asymmetries between insiders and outsiders [55].

To reconcile the traditional (or static) trade-off theory and pecking order theory, the dynamic trade-off theory (DTOT) was developed (Kraus & Litzenberger, 1973; Leland, 1994). Time is valued highly in this theory but not in the static model. The determination of whether and how to use suitable leverage in the firm's capital structure depends on the derivation of two concepts, expectations (targets) and adjustment cost. The adjustment allows for observation of the company's behaviour. Some people have more influence than others and vice versa. The findings of the dynamic model show the shift between actual and desired leverage, despite the dynamic model appearing to be more advanced than the static model.

The third capital structure theory is the market timing hypothesis. This theory explains why companies issue additional shares when they think their stock is overpriced and purchase them back when they think it is underpriced. Market timing aims to take advantage of short-term changes in a company's equity and then maximize it to make a profit for the company [24].

2.2 Capital Structure’s Empirical Determinants

Firm Size.

The trade-off theory argues that larger companies tend to be more diversified, have lower bankruptcy chances [26], have smaller transaction costs of issuing debt, have higher investment opportunities than smaller companies, and have debt agency costs. Relatively lower monitoring costs, easier access to credit markets, and requires more debt to fully benefit from tax protection [58]. With this argument, larger companies will use higher debt.

In contrast, given the pecking-order theory, the information asymmetry between company insiders and capital markets is lower for large companies than for small companies. Therefore, large companies are better able to issue new equity. (Chen, 2004). Other researchers also stated that small companies have to pay more than large companies when issuing new equity [17]. Therefore, the pecking-order theory holds that larger companies will use less debt.

On the other hand, empirical research that analyzes the effect of firm size on the capital structure has been carried out before. Pandey (2004), Czerwonka & Jaworski (2021), Saif-Alyousfi et al. (2020), Arsov & Naumoski (2016), Forte et al. (2013), Lei (2020), Matias & Serrasqueiro (2017), Ahmad & Aris (2015), and Bassey et al. (2014) can prove that the company's capital structure is positively influenced by company size. But on the other hand, Rajan & Zingales (1995), Cooley & Quadrini (2001), Bevan & Danbolt (2002), Faulkender & Petersen (2006), Ali et al. (2022) and Ezeoha (2008) in their research obtained evidence of a negative effect of company size on capital structure.

If it is based on the theory of capital structure, the effect of firm size on the capital structure can be positive (TOT) or negative (POT). Based on research facts, especially DER ratio data as a proxy for capital structure, companies with a ratio below 50% are 57.4% which is more in line with the pecking order theory. In contrast, from the results of previous research, most researchers can prove that company size positively affects capital structure. Thus, the first hypothesis can be formulated as follows:

H1 : Increasing the size of the company will increase the capital structure

Firm Age.

Odit & Gobardhun (2011:117) stated that firm age is usually seen as a standard measure of reputation in the capital structure model. From a life cycle perspective, a company is establishing itself as a sustainable business, thereby increasing its capacity to take on more debt. According to Diamond (1989), company reputation can be used to overcome creditworthiness problems because reputation is a good name built by the company for years, which the market understands as the company's ability to fulfil its obligations on time.

TOT assumes a positive effect of age on the capital structure because mature companies with a better reputation and more experience can reduce agency costs through positive signals on the quality of potential investments. Conversely, according to POT, mature companies have fewer resources for leverage (Adair & Adaskou, 2015: 4). Pandey & Singh (2015:172) states that new companies cannot use more debt because the profits generated are still low and bankruptcy costs are high, so these companies cannot benefit from interest tax shields.

Empirically, the effect of firm age on the capital structure has also been carried out. Sibindi (2016), Saif-Alyousfi et al. (2020), Forte et al. (2013), Ahmad & Aris (2015), and Hall et al. (2004) in their research can prove that firm age has a positive effect on capital structure. On the other hand, several researchers have obtained evidence that firm age has a negative effect on capital structure [67], [76].

If it is based on the theory of capital structure, the effect of firm age on capital structure can also be positive (TOT) and negative (POT). At the same time, from the results of previous research, most researchers can prove that firm age positively affects capital structure. Thus, the second hypothesis can be formulated as follows:

H2 : The more mature the age of the company will increase its capital structure

Profitability.

TOT assumes a positive relationship between profitability and debt ratio. Profitable companies prefer debt because of the tax shield factor. Profitability sends signals to lenders regarding the company's financial health and reduces information asymmetry in the context of funding applications. Conversely, according to POT, profitability has a negative impact on debt ratios. Profitable companies will prioritize cash flow funding to secure their independence and avoid exposure to information asymmetry. Companies will use debt after they have exhausted their ability to generate internal funds. Profitable companies will use less debt [72].

The pecking order theory put forward by Myers & Majluf (1984) explains the influence of information asymmetry between company insiders and outsiders. This theory proposes that firms prioritize their sources of financing in such a way that all internal funds are used up before looking elsewhere for more expensive external finance. According to this theory, highly profitable firms will use less debt than less profitable ones. Another opinion states that long-term and short-term debt are negatively related to capital structure, indicating that companies prioritize retained earnings and do not depend on debt [65].

Empirically, research that analyzes the impact of profitability on the capital structure has been carried out before, most of which can prove that there is a negative effect of profitability on capital structure [27], [29], [63], [64], [66], [68], [77]–[79]. But on the other hand, other researchers [23], [80]–[82] obtained the opposite result, namely a positive effect of profitability on capital structure.

If it is based on the theory of capital structure, the effect of profitability on the capital structure can be positive (TOT) or negative (POT). Based on the results of previous research, most researchers can prove that profitability has a negative effect on capital structure. Thus, the third hypothesis can be formulated as follows:

H3 : The higher the company's profitability, the lower the capital structure

Debt Tax Shield.

The trade-off theory predicts that firms will use more debt when tax rates are higher to take advantage of the tax benefits of higher interest [26]. The tax shield that arises due to the company's ability to reduce its taxable income through reducing interest payments on debt is the main factor that motivates businesses to take on more debt [31].

From the pecking order theory point of view, the effective tax rate has a negative effect on the company's capital structure because the effective tax rate will reduce the company's internal funds that earn profits and will further increase its cost of capital (Rasiah & Kim, 2011:157).

Many other studies can prove the positive effect of tax benefits on debt on capital structure [26], [31], [64], [83], [84]. Conversely, some researchers can also prove the negative effect of tax benefits on debt on capital structure [31], [68], [85].

Based on the theory of capital structure, the effect of tax benefits on debt on the capital structure can be positive (TOT) or negative (POT). From the results of previous research, most researchers can prove that tax benefits on debt have a negative effect on capital structure. Thus, the fourth hypothesis can be formulated as follows:

H4 : debt tax shields have a significant effect on capital structure

Business Risk.

The trade-off theory predicts the negative effect of business risk on capital structure. In other words, companies with highly volatile cash flows should avoid debt financing because highly volatile cash flows can lead to financial difficulties. Thus, to avoid bankruptcy, companies with fluctuating cash flow levels must stop using debt financing (Sibindi, 2016:231).

According to Antoniou et al. (2008:64), companies with high-income volatility risk decreasing income levels under their debt payment commitments, which may result in the need to rearrange funding at high costs or face the risk of bankruptcy. Therefore, companies with very volatile income should have lower debt capital. Frank & Goyal (2009, p. 9) support this view, which states that companies with more volatile cash flows face higher costs of financial distress and have to use less debt.

Meanwhile, the pecking order theory predicts the positive effect of business risk on capital structure based on the idea that cash flow volatility implies income volatility which causes companies to be constrained in their funding using retained earnings. Therefore, companies must seek funding from the debt market (Sibindi, 2016:231).

Empirically, most conclude that there is a negative effect of business risk on capital structure [39], [63], [68], [77], [87]. Conversely, the positive effect of business risk on the capital structure has also been proven by several researchers [68], [88], [89].

Based on the theory of capital structure, the effect of business risk on the capital structure can be negative (TOT) or positive (POT). Based on the results of previous research, most of them obtained evidence of a negative effect of business risk on capital structure, and the fifth hypothesis can be written as follows:

H5 : an increase in business risk will reduce the capital structure

Growth.

Frank & Goyal (2009:8) argue that growth increases financial distress costs, reduces free cash flow problems, and exacerbates debt-related agency problems. Growing companies place greater value on investing with stakeholders. Thus, the trade-off theory predicts that growth reduces the debt ratio. Antoniou et al. (2008:62) suggest that there is a negative relationship between growth opportunities and capital structure

for two main reasons. First, according to the trade-off theory, growth increases the cost of financial distress, thereby forcing managers to reduce debt in their capital structure. Second, in the presence of information asymmetry, firms issue equity instead of debt when overvaluation leads to higher expected growth. Meanwhile, according to the pecking order theory, when the internal resources of a growing company are not sufficient to finance the company's positive NPV investment opportunities, it must increase external capital. If companies need external finance, they issue debt before equity.

According to Myers (1977b) agency theory states that growth opportunities are negatively related to capital structure. Growth opportunities can cause a moral hazard, companies are perceived as riskier and fail to convince lenders to give them credit, so those with growth potential tend to have low debt ratios. Similarly, Jensen & Meckling (1976), Myers & Majluf (1984) and Fama & French (2002) argue that companies with high future growth opportunities should use more equity financing because companies with higher leverage tend to miss opportunities for profitable investment. The trade-off model predicts that firms with more investment opportunities have less leverage because they have stronger incentives to avoid underinvestment and asset replacement which can lead to shareholder-bondholder agency conflicts. The trade-off theory predicts a negative relationship between leverage and investment opportunities. In contrast, according to POT, the relationship is positive. The combination of growth potential and limited access to financial markets encourages firms to seek bank financing [91].

Empirically, the effect of growth on the capital structure has been carried out by many previous researchers. Gupta (1969), in his research, can prove that there is a positive effect of growth on capital structure. Several other researchers can also prove the positive effect of growth on capital structure [60], [63], [66], [79]. But on the other hand, Myers (2001), in his research, can prove that growth negatively affects capital structure supported by several other researchers who also found the same results [61], [93].

Based on the theory of capital structure, the effect of growth on the capital structure can be negative (TOT) or positive (POT). From the results of previous research, it can also be proven that growth negatively or positively affects capital structure. Thus, the sixth hypothesis can be formulated as follows:

H6 : Growth has a significant effect on capital structure

Liquidity.

Based on the trade-off theory, companies with high liquidity can use high debt because of their ability to fulfil their obligations [94] implies a positive relationship between a company's liquidity position and debt ratio, companies that have a high level of liquidity (large short-term assets), have lower liquidity risk and borrow more debt, due to their ability to repay debt. On the other hand, the pecking order theory shows that companies with high liquidity can use their internal funds to finance their investments [95]. In other words, a negative relationship between liquidity and capital structure is expected because companies with more debt are associated with higher liabilities and lower remaining current assets.

Others argue that highly liquid companies tend to have substantial internal funds that reduce their need for more debt financing. In line with the pecking order theory, companies with higher liquidity ratios tend to rely on internal funds to finance their projects. Therefore, previous literature stated a negative relationship between liquidity and leverage [52], [96]. In contrast, the trade-off theory references a positive relationship, indicating that firms with higher liquid assets facilitate the debt repayment process by providing lenders with more collateral and security assets. In addition, a higher current ratio as a measure of liquidity is associated with the fact that companies are in a better position to manage short-term and long-term financial constraints, which leads them to obtain debt financing [97].

Empirically, Jensen (1986), in his research, can prove that there is a positive effect of liquidity on capital structure. This result is supported by several other researchers [23], [98], [99]. However, most empirical evidence supports the view that liquidity negatively affects capital structure [51]–[53], [60], [68], [100].

Based on the theory of capital structure, the effect of liquidity on the capital structure can be positive (TOT) or negative (POT). From the results of previous research, it can also be proven that liquidity positively or negatively affects capital structure. Thus, hypothesis seven can be formulated as follows:

H7 : Liquidity has a significant effect on capital structure

3 Research Framework

The population used in this study is a manufacturing company listed on the Indonesia Stock Exchange. The research period (observation) is 2012-2017, with 2011 as a comparison. All population members are used as samples (saturated samples) with several criteria adjusted to the research objectives. Based on the population criteria that have been determined, the number of sample companies is 103 companies with observation data during 2012-2017 of 618 observation data. Next, we divide the 618 observations based on the debt ratio below 50% and above or equal to 50% based on the capital structure theory. The pecking order theory holds that companies prioritize internal funds, so they have a lower debt ratio (<50%). In contrast, the trade-off theory holds that companies will optimize debt composition more to obtain tax benefits so that the company will have a higher debt ratio (≥ 50%).

3.1 Measurements

Firm Size.

The firm's size was determined by the sum of the company's assets at the end of the fiscal year. Ln Total Assets was used to determine the firm size in this study [50], [86], [101]–[105].

Firm Age.

The firm's age was the period since it became a public business. Thus, firm Age was defined in this study as the period when the company was listed on the stock exchange [19], [20].

Profitability.

Profitability refers to a company's ability to generate profits. Profitability was measured in this study by Return on Assets [80], [89], [93], [106] using a formula:

$$\text{ROA} = \frac{\text{Earning After Tax}}{\text{Total Assets}} \text{x} 100\%$$

Debt Tax Shield.

Debt Tax Shield was the company's profit on taxes from paying interest on the debt. Debt Tax Shield was measured by calculating the difference between corporate tax costs without debt and corporate tax costs with debt or multiplying interest costs by taxes. [107], [108]

Debt Tax Shield = Interest Expense * Tax Rate

Business Risk.

A company's earnings variability (uncertainty) is a business risk. The standard deviation of EBIT was used to assess business risk. [89], [103].

Growth.

The ability of a corporation to expand in size is referred to as growth. Sales growth was used to measure growth in this study. [17], [50], [102] using a formula:

$$\text{Sales Growth} = \frac{\text{Sales}_{(t)} - \text{Sales}_{(t-1)}}{\text{Sales}_{(t-1)}}$$

Liquidity.

The ability of a corporation to fulfil short-term financial obligations on time is called liquidity. The current ratio is used to measure liquidity in this study [50], [52], [93], [98], [101], [104], [106], using a formula:

$$\text{CR} = \frac{Current\ Assets}{Current\ Liabilities} x100\%$$

Capital Structure.

The capital structure is a policy adopted by management to obtain a source of financing for the firm, which will be utilized to fund the company's operating activities. The debt-to-equity ratio confirmed the capital structure (Abor, 2007, 2008; Berger et al., 1997; Ooi, 1999). The formula used:

$$\text{DER} = \frac{Total\ Debt}{Total\ Debt + Equity} x100\%$$

4 Data Analysis And Methodology

This study employed two types of statistical analysis: descriptive statistical analysis and inferential statistical analysis. Descriptive analysis was performed to characterize each variable in more detail. Furthermore, inferential statistical analysis was plotted to determine the independent effect on dependent variables.

4.1 Regression Model

In this investigation, the regression equation model is as follows:

$$CS = a + \beta_1 SIZE + \beta_2 AGE + \beta_3 PRF + \beta_4 DTS + \beta_5 BR + \beta_6 GRO + \beta_7 LIQ + e$$

Where:
SIZE: firm size
AGE: firm Age
PRF: Profitability
DTS: Debt Tax Shield
BR: Business Risk
GRO: Growth
LIQ: Liquidity
CS: Capital Structure

4.2 Empirical Result

Descriptive Statistics.

We used descriptive statistics to summarize the research data and provide a summary of data dissolution and distribution size. The following Table 1 summarizes the results of descriptive statistics:

Table 1. Descriptive Statistics

Variables	The proportion of Debt < 50%					The proportion of Debt ≥ 50%				
	N	**Min.**	**Max.**	**Mean**	**Std. Deviation**	**N**	**Min.**	**Max.**	**Mean**	**Std. Deviation**
Firm Size	355	25,6	33,3	28,4	1,7	263	25,6	33,0	28,6	1,5
Firm Age	355	1,0	39,0	20,3	8,2	263	1,0	40,0	20,2	8,1

Profitability	355	-13,6	65,7	7,4	8,6	263	-29,9	52,7	2,5	9,7
Debt Tax Shield	355	0,0	29,0	12,4	11,2	263	,0	27,2	15,4	11,0
Business Risk	355	18,2	30,6	24,3	2,0	263	17,8	28,4	24,4	1,9
Growth	355	-80,1	204,9	5,6	26,6	263	-71,8	594,7	9,0	42,6
Liquidity	355	40,3	46498,4	498,0	2780,1	263	33,7	830,5	125,4	66,2
Capital Structure	355	0,0	49,8	29,8	12,0	263	50,1	98,8	65,0	11,2

Based on Table 1, for both groups of samples in terms of firm size, the standard deviation value smaller than the average indicates that the overall sample companies have relatively even company sizes. In addition, the average value was inclined to the minimum, indicating that most sample companies had firm sizes below the average. The standard deviation value of the firm's age was smaller than the average, meaning that the company's age was evenly distributed at all points between 1 year to 40 years. However, further examination showed that 40.3% of sample companies were below the average age, and the remaining 59.7% were above the average age.

The sample companies' profitability level in the study period varies between companies. In addition, the average value that is more inclined to the minimum value indicates that most of the sample companies in the study period have a profitability ratio below the average. The debt tax shield of the sample companies is evenly distributed. The average debt tax shield, which is more inclined to the maximum value, indicates that most sample companies have a debt tax shield above the average.

The high and low business risk faced by the sample companies in the study period is relatively the same. The growth rate of the sample company dramatically varies depending on the company's sales achievement level and the group of samples. The standard deviation growth was higher than the minimum value for the sample with the proportion of debt ≥ 50%, indicating that the growth of the sample companies is not evenly distributed.

The sample company's ability to guarantee short-term liability with its current assets was different in terms of liquidity. The standard deviation of liquidity was higher than the average for the sample with the proportion of debt < 50%, indicating that the company's liquidity is not evenly distributed. However, most sample companies were below the rule of thumb for liquidity (2x or 200%). In other words, most of the sample companies did not have sufficient ability to guarantee their short-term debt.

The proportion of debt in the sample companies' capital structure showed analogous statistics. For each sample group, the standard deviation appears below the average, indicating that the sample companies' capital structure is evenly distributed.

Regression Analysis.

The results of the regression analysis can be seen in Table 2 as follows:

Table 2. Empirical Finding

Descriptions	The proportion of Debt < 50%				The proportion of Debt ≥ 50%			
	POT Prediction	Coefficients β	t	*p*-value	TOT Prediction	Coefficients β	t	*p*-value
(Constant)		-13,267	-1,320	0,188		97,613	7,857	0,000
Firm Size	-	2,397	4,801	0,000	+	-2,277	-3,542	0,000
Firm Age	-	-0,219	-2,906	0,004	+	0,243	2,950	0,003
Profitability	-	-0,201	-2,682	0,008	+	-0,225	-3,194	0,002
Debt tax shield	-	0,141	2,645	0,009	+	-0,097	-1,577	0,116
Business Risk	+	-0,842	-1,986	0,048	-	1,394	2,768	0,006
Growth	+	0,033	1,457	0,146	-	-0,001	-,064	0,949
Liquidity	-	-0,001	-3,838	0,000	+	-0,035	-3,484	0,001
Adj. R Square				0,170				0,158
F Test		11,333 (*p*-value 0,000)				8,032 (*p*-value 0,000)		

Based on the empirical finding as presented in Table 2, it can be explained as follows:

1. The effect of firm size on capital structure

For the group sample with a proportion of debt <50%, the results show that the relationship between firm size and capital structure differs from predictions. Firm size positively affects capital structure with a coefficient of 2.397 and a t-test of 4.801 (p-value 0.000). These results are also in line with TOT's view. Larger companies tend to be more diversified, have lower bankruptcy chances, and transaction costs of issuing debt smaller, have higher investment opportunities than smaller companies, have lower debt agency costs, relatively lower monitoring, easier access to credit markets, and

require more debt to benefit from tax protection fully. Empirically these results support the research of Czerwonka & Jaworski (2021), Saif-Alyousfi et al. (2020), Arsov & Naumoski (2016), Forte et al. (2013), Lei (2020), Matias & Serrasqueiro (2017), Ahmad & Aris (2015), and Bassey et al. (2014) which can prove that the company's capital structure is positively influenced by company size.

On the other hand, for the group sample with a proportion of debt ≥ 50%, the results also show that the relationship between firm size and capital structure differs from predictions. Firm size negatively affects capital structure with a coefficient of -2.277 and a t-test of -3.542 (p-value 0.000). This result is also in line with the POT view, which states that the information asymmetry between company insiders and the capital market is lower for large companies compared to small companies. Therefore, large companies are better able to issue new equity (Chen, 2004). Other researchers also stated that small companies have to pay more compared to large companies when issuing new equity so that larger companies will use less debt [17]. Empirically, these results support the research of Rajan & Zingales (1995), Cooley & Quadrini (2001), Bevan & Danbolt (2002), Faulkender & Petersen (2006), Ali et al. (2022) and Ezeoha (2008) in their research obtained evidence of a negative effect of company size on capital structure.

2. The effect of firm age on capital structure

For the group sample with a proportion of debt <50%, the results show that the relationship between firm age and capital structure is as predicted. Firm age negatively affects capital structure with a coefficient of -0.219 and a t-test of -2.906 (p-value 0.004). This result is also in line with the POT view. Mature companies have fewer resources to leverage (Adair & Adaskou, 2015:4). A similar opinion was also conveyed by Pandey & Singh (2015:172) that new companies cannot use more debt because the profits generated are still low. These companies cannot benefit from interest tax shields because bankruptcy costs are high. Several researchers also obtained evidence that firm age negatively affects capital structure [67], [76].

On the other hand, For the group sample with a proportion of debt ≥ 50%, the results also show that the relationship between firm age and capital structure is also in line with predictions. Firm age positively affects capital structure with a coefficient of 0.243 and a t-test of 2.950 (p-value 0.003). This result is also in line with the view of TOT, which assumes a positive effect of age on capital structure based on the fact that mature firms with a better reputation and more experience can reduce agency costs through positive signals on the quality of potential investments. Empirically, these results support Sibindi (2016), Saif-Alyousfi et al. (2020), Forte et al. (2013), Ahmad & Aris (2015), and Hall et al. (2004), who in their research obtained evidence of a positive effect of firm age on capital structure.

3. The effect of profitability on capital structure

For the group sample with a proportion of debt < 50%, the results show that the relationship between profitability and capital structure is as predicted. Profitability significantly negatively affects capital structure with a coefficient of -0.201 and a t-test

of -2.682 (p-value 0.008). This result is also in line with the POT view; profitability has a negative impact on the debt ratio. Profitable companies will prioritize cash flow funding to secure their independence and avoid exposure to information asymmetry. Companies will use debt after they have exhausted their ability to generate internal funds. Profitable companies will use less debt [72]. Empirically, research that analyzes the impact of profitability on the capital structure has been carried out before, most of which can prove that there is a negative effect of profitability on capital structure [27], [29], [63], [64], [66], [68], [77]–[79].

On the other hand, for the group sample with a proportion of debt ≥ 50%, the results show that the relationship between profitability and capital structure is not as predicted. Profitability significantly negatively affects capital structure with a coefficient of -0.225 and a t-test of -3.194 (p-value 0.002). This result is also in line with POT's view that profitability has a negative impact on debt ratios.

4. The effect of debt tax shield on capital structure

For the group sample with a proportion of debt <50%, the results show that the relationship between the debt tax shield and capital structure is not as predicted. Debt Tax Shield positively affects capital structure with a coefficient of 0.141 and a t-test of 2.645 (p-value 0.009). This result is also in line with TOT's view, which predicts that companies will use more debt when tax rates are higher to take advantage of the tax benefits of higher interest [26]. The tax shield that arises due to the company's ability to reduce its taxable income through reducing interest payments on debt is the main factor that motivates businesses to take on more debt [31]. Empirically, several researchers also obtained evidence that Debt Tax Shield has a positive effect on capital structure [26], [31], [64], [83], [84].

On the other hand, for the group sample with a proportion of debt ≥ 50%, the results show that the relationship between the debt tax shield and the debt ratio is not as predicted. Debt tax shield has a negative and insignificant effect. This result is an interesting discussion because, for companies whose proportion of debt is ≥ 50%, the debt tax shield is no longer a consideration in determining the proportion of debt in their capital structure.

5. The effect of business risk on capital structure

For the group sample with a proportion of debt < 50%, the results show that the relationship between business risk and capital structure is not as predicted. The business risk negatively affects capital structure with a coefficient of -0.842 and a t-test of -1.986 (p-value 0.048). These results also align with TOT's view of predicting the negative effect of business risk on capital structure. In other words, companies with highly volatile cash flows should avoid debt financing because highly volatile cash flows can lead to financial difficulties. Thus to avoid bankruptcy, companies with fluctuating cash flow levels must stop using debt financing (Sibindi, 2016:231). Several researchers also obtained evidence that business risk negatively affects capital structure [63], [68], [77], [87].

On the other hand, for the group sample with a proportion of debt ≥ 50%, the results show that the relationship between business risk and capital structure is not as predicted. Business risk has a significant positive effect on capital structure. This result is also in line with the POT view, which predicts a positive effect of business risk on capital structure based on the idea that cash flow volatility implies income volatility which causes companies to be constrained in their funding using retained earnings. Therefore, companies must seek funding from the debt market (Sibindi, 2016:231). Empirically, these results support several previous studies [68], [88], [89], which in their research obtained evidence of the positive effect of business risk on capital structure.

6. The effect of growth on capital structure

For the group sample with a proportion of debt < 50%, the results show that the relationship between growth and capital structure is as predicted but not statistically significant. Furthermore, the group sample with a proportion of debt ≥ 50% shows that the relationship between growth and debt ratio is also as predicted but not significant. These results also indicate that growth is not a factor considered in determining the proportion of debt in the capital structure of the sample companies.

7. The effect of liquidity on capital structure

The results showed that the sample data with the proportion of debt < 50% and ≥ 50% liquidity had a significant negative effect. This result also aligns with POT's view that companies with higher liquidity ratios tend to rely on internal funds to finance their projects. Empirically, several researchers also obtained evidence that liquidity has a negative effect on capital structure [51]–[53], [60], [68], [100].

5 Research Implication

The research results are very interesting to be studied in more depth in further research. The pecking order theory states that companies prefer to meet their funding needs by prioritizing internal funds that are lower risk first. This study is represented by a sample that uses a debt proportion of <50% in its capital structure. According to POT predictions, firm age, profitability, and liquidity have coefficient directions. In contrast, Firm Size, Debt tax shield and Business Risk do not match POT predictions but are more in line with TOT. On the other hand, the trade-off theory states that companies will try to optimize their capital structure to obtain a tax shield. This study is represented by a sample that uses a debt proportion of ≥ 50% in its capital structure. Firm age has a coefficient direction according to TOT predictions. In contrast, firm size, profitability, business risk, and liquidity do not match TOT predictions but are more in line with POT predictions.

Limitation

This study observed manufacturing companies listed on the Indonesia Stock Exchange, consisting of various industrial sectors and sub-sectors or heterogeneous. The generalizability might only be applied to the companies.

The result of R Square was relatively low, indicating that many other variables outside the model affected the capital structure.

6 Conclusions

The group sample with a proportion of debt < 50%, firm age, profitability, and liquidity have a coefficient direction according to POT predictions, while firm size, debt tax shield and business risk do not match POT predictions, and growth is not significant. For the group sample with a proportion of debt ≥ 50%, firm age has a coefficient direction according to POT predictions. In contrast, firm size, profitability, business risk, and liquidity do not match POT predictions, and growth is insignificant.

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Appendices

6.1 Appendix 1 Descriptive Statistics

Descriptives.

Variables	The proportion of Debt < 50%					The proportion of Debt ≥ 50%				
	N	**Min.**	**Max.**	**Mean**	**Std. Deviation**	**N**	**Min.**	**Max.**	**Mean**	**Std. Deviation**
Firm Size	355	25,6	33,3	28,4	1,7	263	25,6	33,0	28,6	1,5
Firm Age	355	1,0	39,0	20,3	8,2	263	1,0	40,0	20,2	8,1
Profitability	355	-13,6	65,7	7,4	8,6	263	-29,9	52,7	2,5	9,7
Debt Tax Shield	355	0,0	29,0	12,4	11,2	263	,0	27,2	15,4	11,0
Business Risk	355	18,2	30,6	24,3	2,0	263	17,8	28,4	24,4	1,9
Growth	355	-80,1	204,9	5,6	26,6	263	-71,8	594,7	9,0	42,6
Liquidity	355	40,3	46498,4	498,0	2780,1	263	33,7	830,5	125,4	66,2
Capital Structure	355	0,0	49,8	29,8	12,0	263	50,1	98,8	65,0	11,2

6.2 Appendix 2 Regression Result

Regression (Group of Sample 1).

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Liq, DTS, BR, Gro, FA, Prof, FS[b]	.	Enter

a. Dependent Variable: CS

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,431[a]	,186	,170	10,9711316	1,986

a. Predictors: (Constant), Liq, DTS, BR, Gro, FA, Prof, FS

b. Dependent Variable: CS

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9548,750	7	1364,107	11,333	,000[b]
	Residual	41766,908	347	120,366		
	Total	51315,658	354			

a. Dependent Variable: CS

b. Predictors: (Constant), Liq, DTS, BR, Gro, FA, Prof, FS

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics
	B	Std. Error	Beta			Tolerance

1	(Constant)	-13,267	10,050		-1,320	,188	
	FS	2,397	,499	,333	4,801	,000	,486
	FA	-,219	,075	-,148	-2,906	,004	,902
	Prof	-,201	,075	-,144	-2,682	,008	,813
	DTS	,141	,053	,131	2,645	,009	,958
	BR	-,842	,424	-,139	-1,986	,048	,477
	Gro	,033	,023	,074	1,457	,146	,911
	Liq	-,001	,000	-,188	-3,838	,000	,977

Regression (Group of Sample 2)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Liq, Prof, Gro, BR, FA, DTS, FS[b]	.	Enter

a. Dependent Variable: CS

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,425[a]	,181	,158	10,2308882	1,892

a. Predictors: (Constant), Liq, Prof, Gro, BR, FA, DTS, FS

b. Dependent Variable: CS

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.

1	Regression	5884,871	7	840,696	8,032	,000[b]
	Residual	26691,124	255	104,671		
	Total	32575,995	262			

a. Dependent Variable: CS

b. Predictors: (Constant), Liq, Prof, Gro, BR, FA, DTS, FS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics
		B	Std. Error	Beta			Tolerance
1	(Constant)	97,613	12,424		7,857	,000	
	FS	-2,277	,643	-,307	-3,542	,000	,427
	FA	,243	,082	,177	2,950	,003	,888
	Prof	-,225	,070	-,195	-3,194	,002	,862
	DTS	-,097	,061	-,096	-1,577	,116	,877
	BR	1,394	,504	,239	2,768	,006	,430
	Gro	-,001	,015	-,004	-,064	,949	,976
	Liq	-,035	,010	-,208	-3,484	,001	,903