

# The Capital Structure: Is Debt just a Policy or Requirement?

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## **The Capital Structure: Is Debt just a Policy or Requirement?**

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**Abstract:**

*The issue about debt as part of capital structure is unclear in context of trade off theory and pecking order theory in term to identify whether it is just a policy or requirement for the firms. The objective of this study is to identify the underlie theories on firms capital structure with its determinant.*

*This study conducts logistic regression with sample of 148 public firms listed in Indonesia Stock Exchange for period of 2011 to 2015. The result of analysis shows profitability, firm size, tangibility, and share price have relationship with capital structure.*

*On these results, the study reports firms with higher total debt ratio shall prefer pecking order model in determining capital structures, and firms with higher long term debt ratio shall prefer pecking order model although the result indicates the agency conflict plays role in determining capital structures, while firms with lower total debt ratio and firms with lower long term debt ratio shall prefer trade off model for capital structures.*

**Keywords:** *Capital structure, trade off, pecking order, market timing*

**JEL Classification:** *D920, G020, G300, G310, G320, G330*

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## 1. Introduction

The presence of debt is started when Luca Pacioli introduced his accounting equation in interpretation that firms are obtaining their assets by using liabilities and equities. After years, debt is always show up in most of firm's financial reports and generally attracting the investors in capital market. The existence of debt is inflicting some questions in context of capital structure, such as "is debt a requirement for most of firms in term to finance their investment activities in objective to achieve the target profit?" or "is debt just a policy for other intentions?". These issues about capital structure of the firms are still in debate around academicians especially in context of trade off theory and pecking order theory since debt has playing its own role which makes the capital structure is still a puzzle (Myers, 1984; Nechaev and Antipina, 2016; Thalassinou *et al.*, 2010; Vovchenko *et al.*, 2017; Fetai, 2015).

Myers (2001) proposes two conditional theories of capital structure for explaining why firms obtaining debt, which are trade off and pecking order. According to Myers (2001), in perspective of trade off, firms as tax payers generally shall look for optimum debt in term to get tax shield, while in perspective of pecking order, firms shall avoid debts if their internal fund such as retained earnings is sufficient for financing their expenditures or investments (Boldeanu and Tache, 2016).

In contrast, the findings by Baker and Wurgler (2002), Klein, O'Brien, and Peters (2002), Hovakimian, Hovakimian, and Tehranian (2004), Altı (2006), Elliott, Kant, and Warr (2008), Thalassinou *et al.* (2015), Allegret *et al.* (2016), Duguleana and Duguleana (2016) and Brendea (2012) show that the market timing hypothesis can become an alternative explanation about capital structures of the firms, where the valuations by investors for share prices in capital market shall trigger the effects of pecking order or trade off in flexible. As developing country, the Indonesia has many firms with various debt. Limited to the samples, based on data from Indonesia Stock Exchange ([www.idx.co.id](http://www.idx.co.id)) the trends of average total debts to total assets ratio are 52.33% for year of 2011, 48.06% for year of 2012, 49.88% for year of 2013, 48.99% for year of 2014, and 50.25% for year of 2015. The trends show that the average of debt to asset ratios for firms in period of 2011 to 2015 are fluctuate in range of almost or even half by their total assets which means most assets of these firms are financed by debts. The study proceeds the next sections as follows, section 2 reviews the relevant literatures and hypothesis development. Section 3 presents the samples, variable definitions and the regression models. Section 4 presents the result and discuss the findings, and finally section 5 concludes the findings.

## 2. Literature Review

### 2.1. Trade off theory and pecking order theory

Similar to Myers (2001), Elliott, Kant, and Warr (2008) propose that, the model of capital structure can be viewed in perspectives of two main theories which are trade

off theory and pecking order theory. Moreover, Elliott, Kant, and Warr (2008) explain that, in perspective of pecking order theory, the firms shall choose the equities with lower cost of capital which implies that the firms shall finance their investments by use their internal funds then by external funds, while in perspective of static trade off theory, the firms in periodically shall adjust their capital structure until it reach the optimum portion.

Sunder and Myers (1999) prove empirically that, the mature firms tend to adopt pecking order model in term to determine their capital structure rather than trade off model. Sunder and Myers (1999) also explain that, although debts shall give tax benefit to firms but the over debts shall make the firms bear the financial distress costs. According to Cheng and Shiu (2007), in view of pecking order theory, the existence of asymmetry information between insiders and outsiders makes firms use their internal fund rather than debts in term for financing the investments, and that is why pecking order assumes the firms tend to decrease their debts when they get profit. Moreover, Cheng and Shiu (2007) explain that, in view of trade off theory, the firms with better profit can get more debts easily because they have better performance, which in turn the debts shall give the tax shield for these firms.

## **2.2. Market timing hypothesis**

According to Baker and Wurgler (2002), the market timing hypothesis is derive from common behavior of firms, where firms shall issue the shares when the market price at overvalue, and repurchase it when undervalue. Moreover, Baker and Wurgler (2002) find that, firms shall have lower debt ratio when they are issuing the shares at higher market price, otherwise the firms shall have higher debt ratio when they are issuing at lower market price. In supporting these findings, Elliott, Kant, and Warr (2008) clarify that, as an application of pecking order theory, firms are more likely to issue new shares when share market prices are high or overvalued by investors which gives impact the firms shall reduce the use of debts, whereas firms with fairly valued or undervalued on their share prices are prefer to issue debts.

Hovakimian, Hovakimian, and Tehranian (2004) confirming the findings by Baker and Wurgler (2002), where the relationship between pecking order theory and market timing hypothesis implies the firms shall issue their shares when the market share prices at overvalued. In addition, Brendea (2012) and Suryanto (2016) explain that, managers should have an ability to identify the perfect time to issue the shares with low cost that in turn will impact to valuation of market price which makes the cost of capital is low and gives benefit the shareholders.

## **2.3. Hypothesis development**

### **2.3.1. Profitability**

According to Myers (2001), in perspective of pecking order theory, if the firms have higher profitability then they shall decrease their debt ratio, while in perspective of trade off theory, if the firms have higher profitability then they shall increase their



debt ratio optimally without existence of financial distress in term to get tax benefit. Moreover, Chen (2004) confirms that, profitability is an important factor to determine capital structure of the firms.

*Ha<sub>1</sub> : Profitability has significant effect to debt.*

### 4.3.2. Firm size

Titman and Wessels (1988), Břečková and Havlíček (2013), Havlíček *et al.* (2013) and Rajan and Zingales (1995) suggest that, the relationship between firm size and capital structure can be viewed in perspectives of pecking order theory or trade off theory. Titman and Wessels (1988) pointing that transaction costs or market value as determinant for firms in preference for equity or debt. Titman and Wessels (1988) also clarify that, small firms are generally more leveraged with short term debts rather than long term debts or new equities because these firms are facing high transaction costs.

According to Rajan and Zingales (1995), larger firms have more chances to get large leverage because they are usually better diversified and have less possibility to be in position of financial distress, and in this case there is a positive effect between firm size and leverage. Rajan and Zingales (1995) also explains that the negative effect between firm size and leverage could be arise because larger firms normally have lower informational asymmetries in capital market which make these firms are more capable to issue new shares rather than issuing debts. Chen (2004) confirms that, there is a relationship between firm size and capital structure especially with long term debt but not with total debt.

*Ha<sub>2</sub> : Firm size has significant effect to leverage.*

### 2.3.3. Asset structure

Frank and Goyal (2003) clarify that, both for perspectives of trade off theory and pecking order theory, the increasing in investments or fixed assets shall increase the use of debts, although Fama and French (2002) also clarify that, even negative relationship between assets and debt can be seen in perspectives of trade off theory or pecking order theory while firms are concerning about risks and costs. Chen (2004) confirms that, firms in developed countries and developing countries use the fixed assets as collateral to get debt, and this is why the fixed asset both for trade off theory and pecking order theory is a factor which can affect the capital structure while they are being financed by debt.

*Ha<sub>3</sub> : Asset structure has significant effect to leverage.*

### 2.3.4. Income tax

Miller (1977) explains that, in perspective of trade off model, the values of the firm shall increase in line with increasing of debts since debt interest expenses give tax benefit for the firms. Graham (1996) confirms that, firms with higher income tax shall use higher debt compared by firms with lower income tax. According to Myers

(2001), firms as tax payers generally shall obtain the optimum debt because debt plays role as tax shield.

*Ha<sub>4</sub> : Income tax has significant effect to leverage.*

### **2.3.5. Share price**

Baker and Wurgler (2002), Hovakimian, Hovakimian, and Tehranian (2004), Alti (2006), Elliott, Kant, and Warr (2008), and Brendea (2012) find that, market timing effect on firms will exist while the share prices are overvalued which makes firms reduce their use of debt. Supporting the findings by Cheng and Shiu (2007), Fenech (2008) finds that, share price will have positive effect to debt when firms decide to replace their source of fund with convertible debt which have lower cost of capital.

*Ha<sub>5</sub> : Share price has significant effect to leverage.*

## **3. Research Methodology**

### **3.1. Sample**

Table 1 defines the sample for this study, where 148 firms which are listed in Indonesia Stock Exchange ([www.idx.co.id](http://www.idx.co.id)) for period of 2011 to 2015 are chosen. Because of different financial report structure, this study then excluding two sectors from the sample which are finance sector and property, real estate, and building construction sector.

**Table 1. Sample**

<b>Sectors</b>	<b>Samples</b>	<b>Observed</b>
Agriculture	10	50
Mining	15	75
Basic Industry & Chemicals	33	165
Miscellaneous Industry	18	90
Consumer Goods Industry	16	80
Infrastructure, Utilities, and Transportation	15	75
Trade, Service, Investment	41	205
<b>Total</b>	<b>148</b>	<b>740</b>

### **3.2. Variable definitions**

This study uses leverage as dependent variable and measures it with dummy (coding with 1 and 0). The leverages are calculated by ratio of total debts to total assets (symbolized by DAR) and ratio of total long term debts to total assets (symbolized by LTDAR). This study separates the leverage with higher debt and lower debt by applying median value for average leverage of each firms. While the independent variables for this study are : profitability which presented by return on assets and measured by ratio of net profit to total assets (symbolized by ROA); firm size which measured by natural logarithms of total assets (symbolized by Size); asset structure which measured by ratio of total fixed assets to total assets (symbolized by Tangibility); income tax which measured by ratio of tax expense to income before

tax (symbolized by Tax); and share price which measured by closing price at the end of year after corporate action (symbolized by Price).

### 3.3. Regression model

This study conducts logistic regression analysis at significance of 0.05 for hypotheses testing and uses chi square value to determine whether the model is fit (insignificant at 0.05) or model is not fit (significant at 0.05). There are two regression models used by this study since the dependent variables are using two types of leverages. The regression models for this study are as follow:

$$\text{DAR}_{\text{dummy}} = \alpha + \beta_1\text{ROA} + \beta_2\text{SIZE} + \beta_3\text{TANG} + \beta_4\text{TAX} + \beta_5\text{PRICE} + \varepsilon \quad (1)$$

$$\text{LTD}_{\text{dummy}} = \alpha + \beta_1\text{ROA} + \beta_2\text{SIZE} + \beta_3\text{TANG} + \beta_4\text{TAX} + \beta_5\text{PRICE} + \varepsilon \quad (2)$$

## 4. Results and Discussion

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### 4.1. Descriptive statistics

Table 2 presents the descriptive statistics for ratio of total debts to total assets, ratio of net profit to total assets, firm size, tangibility or asset structure, ratio of tax expense to income before tax, and share prices as characteristics for firms with higher total debt, firms with higher long term debt, firms with lower total debt, and firms with lower long term debt.

**Table 2.** Descriptive Statistics

	Minimum	Maximum	Mean
<i>Firms with higher total debt</i>			
DAR	0.17	5.03	0.70
ROA	-1.28	3.47	0.04
Size	9.49	19.32	14.96
Tangibility	0.00	0.99	0.34
Tax	-137.65	29.79	-0.13
Price	35.00	37,000.00	1,862.61
<i>Table 2. Descriptive statistics (continue)</i>			
	Minimum	Maximum	Mean
<i>Firms with higher long term debt</i>			
LTDAR	0.00	4.83	0.31
ROA	-1.28	3.47	0.05
Size	9.49	19.32	15.52
Tangibility	0.00	0.99	0.39
Tax	-137.65	29.79	-0.11
Price	35.00	18,000.00	2,287.44
<i>Firms with lower total debt</i>			
DAR	0.00	1.04	0.30
ROA	-0.27	0.75	0.09
Size	9.48	18.93	14.93
Tangibility	0.00	0.96	0.32



Tax	-0.66	4.08	0.23
Price	50.00	132,500.00	4,840.79
<i>Firms with lower long term debt</i>			
LTDAR	0.00	0.29	0.05
ROA	-0.35	0.75	0.08
Size	9.48	17.97	14.37
Tangibility	0.00	0.96	0.27
Tax	-4.33	1.07	0.21
Price	50.00	132,500.00	4,415.97

Table 2 shows the mean value of profitability for firms with low debts is higher rather than firms with high debts which indicates these firms have better performance and tend to increase their debts in term to get tax shield because they have higher income tax expense. Moreover, these firms have higher share prices in capital market make them have much opportunities to choose their sources of fund both of equities or debts. Otherwise, the mean value of size and tangibility for firms with high debts is higher rather than firms with low debts which indicates these firms are allocating most of their debt for financing the investment activities.

**Table 3.** Logistic regression for debt policy

	Firms with higher debt		Firms with lower debt	
	DAR	LTDAR	DAR	LTDAR
ROA	-1.991*	-0.207*	1.991*	0.207*
Size	0.147*	0.554*	-0.147*	-0.554*
Tangibility	-0.302	0.414*	0.302	-0.414*
Tax	-0.013	-0.197	0.013	0.197
Price	-0.282*	-0.184*	0.282*	0.184*
Chi square	0.111**	0.108**	0.111**	0.108**

\*significant at 0.05

\*\*insignificant at 0.05 which means model is fit

#### 4.2. Firms with higher total debt

Table 3 shows that, profitability, firm size, and share price have significant effect to leverage which mean the hypothesis of Ha<sub>1</sub>, Ha<sub>2</sub>, and Ha<sub>5</sub> for this study are accepted, while the insignificant effect by tangibility and income tax make the hypothesis of Ha<sub>3</sub> and Ha<sub>4</sub> for this study are rejected. The negative coefficient and significant by profitability shows that, the firms with higher total debt are following the pecking order model as suggested by Myers (2001) and Chen (2004). Confirming the mean value of profitability for these firms as presented in Table 2, since their profitability are lower rather than firms with low total debts then this result indicates these firms are adjusting their capital structure by reducing debts and starting to use their retained earnings because they are enduring high debt interest expense.

The negative coefficient and significant by share price is appropriate with market timing hypothesis as proposed by Baker and Wurgler (2002), Hovakimian,



Hovakimian, and Tehranian (2004), Alti (2006), and Bredeea (2012) and also supports the concept of market timing as application of pecking order model as proposed by Elliott, Kant, and Warr (2008). This result indicates these firms have tendency to replace the utilization of debt by issuing new shares beside of using their retained earnings. Myers (2001) explains, most of firms have many financing choices in term to adjust their capital structures at relatively low cost of capital. As presented in Table 2, these firms have lower share price relatively at capital market makes them have lower cost of capital when they are choose to issue new shares.

The positive coefficient and significant by firm size is appropriate with trade off model and consistent with Titman and Wessels (1988), Rajan and Zingales (1995), but also gives some ambiguous interpretation because the coefficient of profitability and share price show these firms are applying the pecking order model. In this study, the proxy for firm size is total assets which have component of tangible assets (current assets and fixed assets) and intangible assets, and the proxy for total debt which have component of short term debts (includes deferred debt interest expenses) and long term debts.

Notice for negative coefficient of tangibility although it is insignificant but the sign of this coefficient confirms that the firms with higher total debt do not have tendency to use debt in financing their investment activities or fixed assets. This result imply that the positive effect by firm size may caused by increase for short term debts in financing their current assets or deferred debt interest expenses. Under these circumstances then firms with higher total debt are applying pecking order model.

#### **4.3. Firms with higher long term debt**

Table 3 shows that, profitability, firm size, tangibility and share price have significant effect to leverage which mean the hypothesis of  $Ha_1$ ,  $Ha_2$ ,  $Ha_3$  and  $Ha_5$  for this study are accepted, while the insignificant effect by income tax makes the hypothesis of  $Ha_4$  for this study are rejected. The coefficient of profitability for firms with higher long term debt are negative and significant which means these firms are applying pecking order model as suggested by Myers (2001) and Chen (2004). Since they have lower profitability rather than firms with lower long term debt as presented in Table 2, then these firms are tend have similar conditions as firms with higher total debt which means they are starting to use their retained earnings because enduring high debt interest expense.

Similar firms with higher total debt, the negative coefficient and significant by share price shows the effect of market timing and at once confirming the pecking order model for these firms as suggested by Baker and Wurgler (2002), Hovakimian, Hovakimian, and Tehranian (2004), Alti (2006), Elliott, Kant, and Warr (2008), and Bredeea (2012). As presented in Table 2, these firms are also have lower share

market prices relative to firms with lower long term debt which makes them can issue new shares at lower costs while their prices are overvalued.

The positive significant by coefficients of firm size and tangibility may be viewed in perspective of pecking order model as suggested by Titman and Wessels (1988) and Rajan and Zingales (1995), where pecking order model suggests the firms can prefer to obtain more debt while the firms are lack for retained earnings and the cost of debt are low, which implies the firms should have optimum capital structures and do not have financial distress. Another possibility to support the explanation about this condition is agency conflict, as suggested by Jensen (1988), Myers (2001), and Aivazian, Ge, and Qiu (2005), where these firms have tendency to control their manager's behavior in creating overinvestment.

#### **4.4. Firms with lower total debt**

Similar to firms with higher total debt, Table 3 shows that, profitability, firm size, and share price have significant effect to leverage which mean the hypothesis of  $Ha_1$ ,  $Ha_2$ , and  $Ha_5$  for this study are accepted, while the insignificant effect by tangibility and income tax make the hypothesis of  $Ha_3$  and  $Ha_4$  for this study are rejected. The positive significant by profitability is appropriate with trade off model as suggested by Myers (2001). As clarify by positive insignificant of tangibility, the negative significant by firm size is still consistent with trade off model as suggested by Titman and Wessels (1988) and Rajan and Zingales (1995) which implies that firms with lower total debt have tendency to obtain more long term debts rather than short term debts.

The positive coefficient and significant by share price is supporting findings by Cheng and Shiu (2007) and Fenech (2008) but inconsistent with market timing hypothesis as suggested by Baker and Wurgler (2002), Hovakimian, Hovakimian, and Tehranian (2004), Altı (2006), and Brendea (2012). As presented in Table 2, these firms have higher share price rather than firms with higher total debt which implies these firms shall face higher cost of equities as demanded by shareholders when they are prefer for equities or to issue new shares as suggested by Titman and Wessels (1988) and Fenech (2008). The positive effect by share price is also consistent with Bonaimé, Öztekin, and Warr (2014) who find that, the firms with higher debts shall have lower share prices while firms with lower debts shall have higher share prices which is appropriate with trade off model.

#### **4.5. Firms with lower long term debt**

Similar to firms with higher long term debt, Table 3 shows that, profitability, firm size, tangibility and share price have significant effect to leverage which mean the hypothesis of  $Ha_1$ ,  $Ha_2$ ,  $Ha_3$  and  $Ha_5$  for this study are accepted, while the insignificant effect by income tax makes the hypothesis of  $Ha_4$  for this study are rejected. The positive significant by profitability is appropriate with trade off model



as suggested by Myers (2001). Confirming this result, the coefficient for share prices also have positive significant effect and consistent with Titman and Wessels (1988) and Fenech (2008) which means these firms are tend to obtain debts rather than to issue equities because they are facing higher cost of capital by investors since they have higher share prices as presented in Table 2. In this case, firms with lower long term debt are not under circumstances of market timing effect. Although it has insignificant effect, but the positive coefficient by tax income is consistent trade off model as suggested by Miller (1977), Graham (1996), and Myers (2001) and at once supporting the significant effect by profitability and share price.

The negative significant by firm size and tangibility are consistent in perspective of pecking order model or trade off model. Following Titman and Wessels (1988) and Rajan and Zingales (1995), in perspective of pecking order model with context of investments, the firms shall use their retained earnings at first and shall use debts with lower costs after the retained earnings are less which implies they shall reduce their debts at first. Fama and French (2002) suggest, the firms commonly shall use their retained earnings at first for investment activities in term to avoid the risk of debt. As the firms with lower long term debt have tendency to face higher cost of equities and looking for tax shield then their preference for debt indicates these firms are not avoiding the risk of debt, which means they are not applying the pecking order model.

Otherwise, since these firms have lower size and tangibility rather than firms with higher long term debt as presented in Table 2, then it means these firms have large opportunities for investments with high positive net present value. Fama and French (2002) suggest that, in perspective of trade off model, the firms with high value of investments shall reduce the utilization of debt because they shall get large return on investments which implies the firms with lower long term debt are applying trade off model.

## 5. Conclusions and Limitations

The capital structure is still a puzzle since debt has playing its own role both in perspective of trade off theory and pecking order theory. The presence of debt is inflicting some questions whether it is just a policy or requirement for the firms. This study conducts logistic regression with sample of 148 public firms listed in Indonesia Stock Exchange for period of 2011 to 2015 with objective to give some empirical evidences about capital structure. As a developing country, Indonesia has many firms with large growth opportunities which make them have various of debt in order to reach the optimum cost of capital. The result of analysis shows profitability, firm size, and share price are the most variables which affecting to debt policy, while the tangibility has effect only for certain conditions, such as firms with higher long term debt ratio and firms with lower long term debt ratio. On these



results, the study reports that, firms with higher total debt ratio shall prefer pecking order model in determining capital structures, and firms with higher long term debt ratio shall prefer pecking order model although the result indicates the agency conflict plays role in determining capital structures, while firms with lower total debt ratio and firms with lower long term debt ratio shall prefer trade off model for capital structures.

This study suggests that, firms are commonly looking the optimum debts for optimum capital structures, which means debt is not only a policy but it is also a requirement in financing the investments. In addition, the implication of these findings indicates that capital structure is not only affected by insiders but can be from outsiders or market depend on firm's requirements. Since the findings are in scope of trade off theory and pecking order theory, then this study suggests for next studies to extent the topics with agency conflict. Although the findings by this study is not absolute when it is limited to sample and phenomena in period of observation, but hope it can be the reference for the next studies about capital structure.

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