Determination Of Capital Structure Factors: Evidence From Building Construction Industries In Indonesia

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ABSTRACT

Research has contributed to testing the Determinants of Capital Structure: Evidence from the Building Construction Industry in Indonesia, in the period 2008-2015. Secondary data used is based on time series data and cross section. Through the purposive sampling method, the total sample selected are 6 construction construction companies and used panel data regression analysis techniques that are processed with program EVIEWS 9. From the Chow test and Hausman test results show that as a data estimation technique used is the Fixed Effect model. Five independent variables in this study, which resulted in an analysis that partially profitability and liquidity had a significant effect on leverage. The results of this empirical study indicate that there is strong evidence to support the pecking order theory by building construction companies based on variable liquidity determinants of capital structure, and profitability variables are also very supportive for the trade-off theory relationship. Firm size, tangibility and non-debt tax shield have no significant effect on leverage. Together, firmsize factors, profitability, tangibility, non-debt tax shields and liquidity significantly influence the leverage of building construction companies. So, based on the trade-off theory, optimal leverage is a balance between tax benefits from debt and bankruptcy costs and agency costs incurred by the company. The sample in this study is only building construction companies so that they only have specifications in the type of business of the sample company, so the influence of the independent variables (only) only describes the specific influence in the building construction sector.

Keywords: Leverage; Firm Size, Profitability; Tangibility; Non-Debt Tax Shield; Liquidity
INTRODUCTION

Modern theories of capital structure were initiated by Miller and Modigliani (1958) with their well-known propositions that describe how and why capital structures are irrelevant. Since then, a number of extensive studies have focused on how companies decide between equity and debt to finance. The 2008 financial crisis contributed to increasing attention to capital structure decisions, because highlighting the importance of deviations from the irrelevant theorems of Miller and Modigliani (Kashyap and Zingales, 2010).

A developing company needs capital that can be collected from debt or equity. The capital structure theory is closely related to the cost of corporate capital. Capital structure is a combination of long-term funding sources used by the company. The main purpose of capital structure decisions is to maximize the market value of the company through the right mix of long-term funding sources. This mixture, called the optimal capital structure, will minimize the overall cost of capital of the company (Khrawish and Khrawish, 2010).

There are arguments about whether the optimal capital structure really exists. The argument focuses on whether companies can influence the valuation and cost of capital by varying the mix of funds used (Besley and Brigham, 2000: 458, Ross et al., 2008). It is also important to test the company's capital structure because it influences the company's decisions about work, production and investment (Harris and Raviv, 1991; Ramli, 2010; Ramli, 2012). It is easy for us to say that the optimal capital structure of a company is the composition of debt and equity which results in a minimum cost of capital. Capital structure is important for survival in the industry, growth and performance of the company. There has been concern throughout the world in detecting variables related to debt leverage (Voulgaris et al., 2004).

The combination of debt and equity (capital structure decisions) is one of the most important decisions at the financial policy level, and one of the many aspects examined in corporate finance. In the form of business enterprises, generally it is the duty of top management to make capital structure decisions by increasing the value of the company. Although, maximizing the value of a company is not an easy task because it involves selecting a debt and equity effect in a balanced proportion and still looking at different costs and benefits associated with that effect. Inappropriate decisions in the method of
selecting securities can cause companies to experience financial difficulties and bankruptcy (Pratheepan and Banda, 2016).

Some researchers have tried to determine what factors influence corporate funding decisions. Overall this has resulted in two main theories, pecking order theory and trade-off theory. The trade-off theory explains that the choice of capital structure is the result of trade-offs between the benefits of debt, such as the debt tax shield, and costs of debt, including bankruptcy costs and costs of financial distress (financial difficulties).

In contrast, the progress of the pecking order theory is that companies prefer the cheapest funding source. Because of information asymmetry, companies will prefer internal funding rather than external funding and choose debt funding rather than equity (Myers, 1984). Two capital structure theories are the basis for many subsequent studies, where analysis attempts to determine the best model that explains the financing choices and what factors might make capital structure decisions. However, past empirical research has provided conflicting results and evidence of the theory's ability to explain capital structure is still limited. Researchers continue to strive to determine the most important determinants of capital structure and how this varies across companies, industries and countries.

This study analyzes the explanatory power of the theory set and company-specific factors from the literature in explaining the choice of capital structure in construction companies registered in Indonesia. Researchers limit research by taking five factors to determine whether these factors have a significant influence on the selection of capital structures. These factors are firm size, profitability, tangibility, non-debt tax shield and liquidity.

The construction industry in Indonesia has developed rapidly in recent years and plays an important role not only in economic growth and development, but also in satisfying physical and social needs. It is said that the construction industry is capital intensive, requires a large amount of capital with a high proportion of fixed costs. Because the financial conditions of most companies in the construction industry are very sensitive to the economic cycle, making decisions to finance their operations whether external or internal sources is really important. Therefore, planning a reasonable capital structure in construction companies in Indonesia that are listed on the IDX is needed in the process of strong competition at this time.
Previous studies have mostly investigated capital structure factors in developed countries. Glen and Singh (2004) emphasize that the capital structure of companies in developing countries or emerging markets and in developed countries is very different. In addition, previous research rarely examined the determination, factors or changes in capital structure in construction companies. Therefore, this research was conducted in the construction industry of Indonesia, developing countries in Asia, with the aim of filling this gap. This study will use panel data regression analysis which empirically understands how various company-specific factors have an impact on the company's leverage ratio, so this study takes the title of Determinants of Capital Structure: Evidence from the Building Construction Industry in Indonesia. This research is based on panel data set in the period 2008-2015 which is included in the building construction industry listed on the Indonesia Stock Exchange.

**Study of Theory and Hypothesis Formulation**

**Defining Capital Structure**

The overall goal of a company is to maximize company value and create value for shareholders. The firm's value is calculated by the present value of the expected future cash flows, the discount by the weighted average capital cost. In order to maximize company value, management needs to invest in generating cash flow. This investment requires funds and companies must decide whether they want to use debt or equity. The optimal mix of debt and equity can minimize the cost of a weighted average capital and consequently increase shareholder value and firm value (Berk and DeMarzo, 2013). Capital structure is an expression of how a company's total assets are financed and is a decision that poses many challenges for the company.

Determining the right mix of equity and debt is one of the company's most strategic decisions (Modugu, 2013: 14). A company has three main sources of financing that they have to finance their investment. This includes the use of retained earnings, borrowing money and issuing new shares. Along with financing options, this represents the company's capital structure, as well as its ownership structure.
**Modigliani's and Miller's propositions**

Capital structure theory was originally developed by Modigliani and Miller (1958). There are two main theories of capital structure that form the basis of research. The first is the trade off theory (Kraus and Litzenberger, 1973; Myers, 1977) and the second is pecking order theory (Myers and Majluf, 1984; Myers, 1984). Therefore, the theoretical principles underlying financing, capital structure and corporate loan choices can be explained both in terms of trade-off theory or static pecking order theory. Static trade-off theory explains various aspects, such as exposure (exposure) of bankrupt companies and agency costs that contradict the benefits of taxes associated with debt use (Amidu, 2007).

Modigliani and Miller (1958) remain as pioneers in testing hypothetically and algebraically representing the effect of capital structure on firm value. In their theory, Modigliani and Miller (MM) prove that under the perfect capital market hypothesis, there is no tax, no bankruptcy, no transaction costs, the value of the company is independent of the capital structure. Modigliani and Miller consider that in perfect capital markets and come up with a broad concept that "capital structure is irrelevant", where the notion of the broad concept states that decisions regarding the capital structure taken by the company will not have an impact on the value of the company those who use debt are equal to the value of companies that do not use debt. Whatever the company's debt will not affect the company's market value. The following is the opinion of Coopeland (2005) regarding Theory MM I "The value of the levered firm is equal to the value of the unlevered firm".

But in his theory, Modigliani and Miller are based on several assumptions. Here is an explanation of Brigham and Ehrhardt (2005) "MM’s study was based on strong assumptions, there were no brokerage costs, there were no taxes, there were no fees, investors could borrow at the same rate as corporations, all investors have the same information about management of future investment opportunities, EBIT is not affected by the use of debt."

**Modigliani-Miller II Theory**

Modigliani-Miller II Theory improves the Modigliani-Miller I. Theory This theory considers the corporate income tax, so consider interest tax shield factors. Corporate debt will reduce the income tax paid by the company, because the company needs to pay interest to the
creditor. Therefore in this theory MM states that the value of the company increases in line with the increase in corporate debt (Indriawati and Suhendro, 2006).

In the perfect market with company tax, the use of 100% debt will be better for the company, because the cost of capital will decrease so that the value of the company will increase. That is, the value of companies that use debt is greater than the value of companies without debt (Indriawati and Suhendro, 2006).

**Trade-Off Theory**

As Myers (1984) the trade-off theory is to balance the savings of taxes from debt and bankruptcy costs. According to this theory, the choice of capital structure is determined by trade-offs between the benefits of debt and debt costs (Kraus and Litzenberger, 1973). As explained by many researchers, the optimal capital structure of the company involves a trade-off between bankruptcy costs and agency costs, the influence of corporate and personal taxes (Jensen and Meckling, 1976), bankruptcy costs, tax benefits and agency costs associated with substitution assets (Myers, 1977), and overinvestment (Jensen, 1986; Stulz, 1990).

Anarfo (2015) explains that, "Trade-off theory of capital structure states that is a choice of its debt" equity ratio is a trade-off between its interest tax shields and the cost of financial distress. " The trade-off theory suggests that companies with industries should have the same debt ratio to maximize tax savings. The tax benefits among other factors make the cost of debt after tax become smaller, so the weighted capital cost will also be smaller. Grigham and Gapenski (1996) in Anarfo (2015) stated that "An optimal capital structure can be obtained if there is an existent tax benefit which is equal to the bankruptcy cost". So that it can be concluded that, there is an optimal capital structure when the average cost of capital of the company is in the minimum position.

**Pecking Order Theory**

The pecking order theory was developed by Stewart C. Myers in 1984 and defined the preferred capital rating. Furthermore Myers (2003) claims that "... financing is adjusted to reduce the problems created by differences in information between insiders and outside investors". This theory can be explained from the existence of transaction costs and
asymmetric information perspectives (Swinnen et al., 2005). Therefore, companies prefer retained earnings rather than debt and only in extreme circumstances use equity financing (Myers, 1984). As a result, variations in the level of corporate debt are driven by the company’s net cash flow and not by the trade-off between costs and benefits of debt (Fama and French, 2002). Information asymmetry occurs when the owner-manager has complete information about the true value and quality of the company, while investors have less information. This makes it difficult for investors to separate between good and bad quality companies. Investors cover this uncertainty by requiring a higher rate of return and thus making capital more expensive for the company (Frank and Goyal, 2008). Asymmetric information in turn can cause the problem of adverse selection.

Based on the condition of pecking orders, companies prefer internal rather than external funding. Therefore profitable companies will borrow less because they have more available internal financing (Myers, 2003) and less profitable companies will use more debt. There is no debt ratio to specific values for companies in this theory, so the level of debt of a company that has been generated reflects external financial needs, not specific targets (Myers, 1984). In addition, companies with net cash flow are more volatile which, according to the theory, are more likely to have leverage (Fama and French, 2002). Titman and Wessels (1988) examine different models that describe alternative capital structures, involving all hypotheses together in empirical tests; they propose as more confident in pecking (hierarchy) than the adjustment target model.

**Previous Research Study**

**Prateephan and Banda** (2016) used panel data analysis to find out to determine the effect of firm size, profitability, growth, tangibility and non-debt tax shields on capital structure in 55 companies listed on the Colombo Stock Exchange (CSE) for ten years using the Fixed Effect Model. The results showed that profitability had a negative effect on capital structure, while firm size and growth had a positive effect on capital structure. Furthermore, non-debt tax shields and tangibility do not significantly influence the capital structure.

**Temile, et al.** (2016) tested the control variables which are also often used as determinants of company leverage such as tangibility, size and company liquidity to
determine the company’s preferred financing in Nigeria, by investigating 10 companies quoted on the Nigerian stock market between 2007-2011 using Ordinary Least Square. In particular, data analysis revealed that the tangibility and liquidity of the Company were negatively correlated, while the size of the company was found to be positively related to corporate debt.

**Memon, et al.** (2015) uses panel data for the 2001-2012 period from 143 registered companies from Pakistan taken from the Thomson Financials Worldscope database and utilizes two measurements of debt, namely total liabilities to total company assets and long-term debt to total assets to understand the influence of certain company variables and debt macroeconomics in Pakistan, using pooled OLS and fixed effect regression. The resulting research is profitability, cash, non debt tax shield companies have a significant negative effect on their debt levels. Size, tangibility, company growth has a significant positive effect on debt. GDP growth rates, tax rates, inflation and interest rates have a significant impact on the company's long-term debt.

**Hypothesis Formulation**

With the existence of previous research and from the theories above, the analysis of the determinants of capital structure can be explained as follows:

**Effect of Firm Size on Leverage**

Firm size is generally used as a hypothetical determinant of the choice of capital structure (Rajan and Zingales, 1995; Titman and Wessels, 1988). According to the trade-off theory, large companies will have less risk because they are more diversified and have more stable cash flows. Therefore, large companies will have lower financial difficulty costs and the possibility of lower bankruptcy costs. In addition, large companies will have a good reputation in the debt market because they will receive a higher credit rating because the risk of default is lower. This means a positive relationship between firm size and leverage (Frank and Goyal, 2005; Titman and Wessels, 1988). Empirical studies conducted by Pratheepan (2016), Memon, et al (2015), Temile, et al (2016), Serghiescu, L. and Vaidean, VL (2014), Bayrakdaroglu et al (2013), Yusuf, et al (2013), Lim (2012), Olayinka (2011), Rajan and Zingales (1995) found a positive relationship between firm size and leverage.
Regarding the pecking order theory, Rajan and Zingales (1995) suggest that this relationship can be negative. Large companies have less information on asymmetry. As a result, the opportunity to issue undervalued shares is reduced and will encourage large companies to use equity financing. Frank and Goyal (2009) agree, and argue that large companies have easier access to the capital market than their smaller counterparts. As a result, it will be easier to attract equity and these companies will thus have less debt. Previous studies varied in concluding whether company size is a significant factor for capital structure. Ozkan (2001), Titman and Wessels (1988), among others, found a negative relationship between company size and leverage.

**H1:** *Firm Size has a significant influence on leverage*

**Effect of Profitability on Leverage**

The trade-off hypothesis assumes a positive relationship between profitability and leverage because low profitability can increase the risk of bankruptcy (Kayo and Kimura, 2011). Profitability has been the most significant determinant in previous studies regarding capital structure. This shows how well management can utilize total assets to generate profits. According to the trade-off theory, the higher the profitability of the company, the more likely the company is to issue debt as it reduces the tax liability. In addition, companies with high high profitability ratios have less risk of bankruptcy and financial difficulties. In addition, debt providers will be more willing to provide loans to profitable companies because the default probability is low. Therefore the theory predicts a positive relationship between leverage and probability, as found in the study of Yusuf, et al (2013).

The relationship between company profitability and capital structure can be defined by the pecking order theory propositioned by Myers and Majluf (1984). In comparison, pecking order theory predicts a negative relationship, because companies prefer to finance themselves through retained earnings. A profitable company will retain more income and as a result, the leverage needed must decrease. Nunkoo and Boateng (2009) studied capital structure in Canadian companies and found a significant positive relationship between profitability and debt. However, most previous empirical research shows that profitability has a negative effect on leverage (Pratheepan (2016); Memon, et al (2015); Serghiescua, L.
and Vaidean, VL (2014); Bayrakdaroglu, et al (2013), Lim (2012); Olayinka (2011); Ozkan, 2001; Rajan and Zingales (1995). Companies that have high profits, will use low amounts of debt, and vice versa. This phenomenon is supported by the results of the research of Titman and Wessels (1988), Ozkan (2001) who use the debt ratio to describe the capital structure, that there is a negative relationship between profitability and leverage

**H2: Profitability has a significant influence on leverage**

**Effect of Tangibility on Leverage**

Intangible assets include fixed assets, such as machinery and buildings, and current assets, such as inventories. Compared to intangibles, non-physical assets, tangible assets are easier to pledge so that they will incur a smaller loss if the company enters financial difficulties. Intangible assets are associated with higher leverage ratios because they can be better guarantees for debt (Rajan and Zingales, 1995). In addition, a high tangibility ratio will reduce agency costs and expected problems. The trade-off theory shows a positive relationship between tangible assets and debt ratios, because tangible assets can function as collateral for debt financing (Frank and Goyal, 2009). This is in accordance with the majority of previous empirical studies Yusuf, et al (2013), Memon, et al (2015), Rajan and Zingales (1995) who found that companies with more tangible assets had a higher leverage ratio.

In pecking-order theory, however, companies owned by more assets still have less asymmetrical information. Therefore, companies tend to rely on equity financing and thus the negative relationship between tangibility assets and debt levels. Olayinka (2011), Lim (2012), Bayrakdaroglu, et al (2013), Serghiescua, L. and Vaidean, V.L. (2014), Temile, et al (2016) showed a negative relationship between tangibility and debt based on their results.

**H3: Tangibility has a significant influence on leverage.**

**Effect of Non-Debt Tax Shield on Leverage**

Debt financing is less attractive if there are NDTS in the company, such as investment or depreciation (Ali, et al., 2013). Companies can use non-interest items to reduce their tax bills. In other words, according to the trade-off theory, companies with higher NDTS tend to use less debt (Titman and Wessels, 1988).
This is supported by research conducted by Ozkan (2001). Some investments can generate NDTS benefits that are not related to how the company finances the investment. Although this investment does not consist of the costs of related debt, they act as a substitute for tax shields. Therefore, an inverse (negative) relationship is expected between the number of non-debt tax protectors and leverage. Memon, et al. (2015), Lim (2012), Ozkan (2001) also found a negative relationship between non-debt tax shields and leverage.

The pecking order theory does not predict anything that is clearly related to the non-debt tax shield. There is an argument that companies with good performance in recent years have a risk of failing to pay less with more debt capacity. Thus, they can obtain more leverage to exploit debt tax-shield profits (tax shield from debt) (Forte, et al., 2013).

Empirical evidence about the use of proxies for NDTS is almost the same. For example, Bayrakdaroglu, et al. (2013) use the amount of annual depreciation costs divided by total assets to measure NDTS and find leverage positively related to NDTS. Whereas Titman and Wessels (1988) have reported that there is no effect on the debt ratio that occurs from Non-debt tax shields. Shah and Khan (2007) also provide empirical evidence of insignificant coefficients on non-debt tax shields.

**H4: Non-debt tax shield has a significant influence on leverage**

**Effect of Liquidity on Leverage**

Liquidity can be defined as the ability for companies to use current assets to cover their current obligations. Thus, this says something about how well the company fulfills their short-term obligations. In the trade off theory believes that a positive relationship exists between leverage and liquidity because higher liquidity ratios can support a relatively higher debt ratio because of the greater ability of the company to fulfill short-term contractual obligations on time. Liquidity will have a positive effect on leverage. This is supported by research conducted by Ozkan (2001), Olayinka (2011).

But the pecking order theory believes that a negative relationship exists between liquidity and leverage because companies with sufficient liquidity can use available funds internally to finance investments Internal funds are the most preferred source of capital for companies. Therefore, companies are more likely to make reserves of retained earnings (Ali, et al., 2013). Companies that are able to convert their assets into cash, use these

**H5:** Liquidity has a significant influence on leverage.

**Effect of Firm Size, Profitability, Tangibility, Non-Debt Tax Shield and Liquidity on Leverage**

To measure whether the independent variable (firm size, profitability, tangibility, non-debt tax shield and liquidity) together have a significant effect on the dependent variable (leverage) can be proposed the sixth alternative hypothesis (H6)

H6: There is a significant effect of firm size, profitability, tangibility, non-debt tax shield and liquidity on leverage

**Theoretical Framework**

The literature review identifies variables that affect the capital structure of building construction companies and has been referred to as company-specific factors. According to the literature review, this study can present the relationship between explanatory variables and response variables as follows:
RESEARCH METHODS

In this study, the population determined were companies in the building construction industry listed on the Indonesia Stock Exchange (IDX) for the period of 2008 to 2015, which were 11 (eleven) companies. With the population obtained 6 (six) companies to be sampled. The sample selection method uses purposive sampling method which is a sample selection technique with prescribed considerations (Sugiyono, 2012: 85).

Table 1: Sample Selection Procedure

<table>
<thead>
<tr>
<th>No.</th>
<th>Information</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Do not issue financial statements and have a fiscal year ending on December 31 during the period 2008-2015</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Do not report financial data to calculate dependent and independent variables</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>Total companies sampled</td>
<td>6</td>
</tr>
<tr>
<td>5.</td>
<td>Total research data (6 x 8 years)</td>
<td>48</td>
</tr>
</tbody>
</table>

Source: Data Results, 2017

This research uses panel data analysis which is a combination of time series data and cross section data (Widarjono, 2009: 9). In analyzing panel data, there are three models that can be used, namely, Pooled OLS Model, Fixed Effect Model and Random Effect Model. There are three tests carried out to determine the most appropriate technique in estimating panel data regression that is by testing paired with Chow Test, Hausman Test and LM Test (Widarjono, 2009: 238).

In testing the effect of independent variables on the capital structure, the equation used is

\[ LEV_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 NDTS_{it} + \beta_5 LIQD_{it} + \varepsilon_{it} \]

Where \( \beta_0 \) is the interception of the equation from \( \beta_1 - \beta_5 \) is the regression coefficient of the independent variables namely SIZE, PROF, TANG, NDTS and LIQD, and \( \varepsilon_{it} \) is a stochastic error term of company \( i \) at time \( t \).
RESULTS AND DISCUSSION

Descriptive statistics

The results of the descriptive analysis in Table 3 using panel data analysis show that the combination of cross sections as many as 6 companies and time series for 8 years, from 2008 to 2015, obtained a total of 48 samples.

Table 3: Descriptive Statistical

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.645936</td>
<td>28.87955</td>
<td>0.094364</td>
<td>0.084933</td>
<td>0.004417</td>
<td>1.474380</td>
</tr>
<tr>
<td>Median</td>
<td>0.632207</td>
<td>28.66579</td>
<td>0.086943</td>
<td>0.050445</td>
<td>0.002032</td>
<td>1.404282</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.882955</td>
<td>30.58222</td>
<td>0.197862</td>
<td>0.284332</td>
<td>0.016930</td>
<td>2.303360</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.353894</td>
<td>27.88531</td>
<td>0.011440</td>
<td>0.008511</td>
<td>0.000165</td>
<td>0.926021</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.149272</td>
<td>0.737394</td>
<td>0.043002</td>
<td>0.071128</td>
<td>0.004571</td>
<td>0.266986</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.017320</td>
<td>0.595723</td>
<td>0.716045</td>
<td>1.201647</td>
<td>1.037611</td>
<td>0.993538</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.005027</td>
<td>2.349878</td>
<td>3.260290</td>
<td>3.715089</td>
<td>2.854754</td>
<td>4.414169</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>1.982343</td>
<td>3.684401</td>
<td>4.237264</td>
<td>12.57435</td>
<td>8.655278</td>
<td>11.89669</td>
</tr>
<tr>
<td>Probability</td>
<td>0.371142</td>
<td>0.158468</td>
<td>0.120196</td>
<td>0.001860</td>
<td>0.013199</td>
<td>0.002610</td>
</tr>
<tr>
<td>Sum</td>
<td>31.00495</td>
<td>1386.219</td>
<td>4.529476</td>
<td>4.076805</td>
<td>0.212004</td>
<td>70.77022</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>1.047255</td>
<td>25.55624</td>
<td>0.086910</td>
<td>0.237784</td>
<td>0.000982</td>
<td>3.350240</td>
</tr>
<tr>
<td>Observations</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Cross sections</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Results of Processing Eviews 9, 2017

The leverage variable has an average value of 0.645936 and a standard deviation of 0.149272, and a maximum value of 0.882955 with a minimum value of 0.353894. Firmsize variables have a standard deviation of 0.737394 and an average value of 28.87955, with a maximum value of 30.58222 and a minimum value of 27.88531. The profitability variable has a maximum value of 0.197862, the minimum value is 0.011440, the average value is 0.094364 and the standard deviation is 0.043002. The tangibility variable produces an average value of 0.084933, the standard deviation is 0.071128, the maximum value is 0.284332 and the minimum value is 0.008511. From the non-debt tax shield the average value is 0.004417, the standard deviation amounting to 0.004571, the maximum value is 0.016930 with a minimum value of 0.000165. While the liquidity variable has an average
value of 1.474380, a standard deviation of 0.266986 and a maximum value of 2.303360 with a minimum value of 0.926021.

**Chow Test**
The use of the Chow test is applied to choose between the common effect model or the fixed effect model.

**Table 4: Chow Test Results**

<table>
<thead>
<tr>
<th>Effects Test</th>
<th>Statistic</th>
<th>d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section F</td>
<td>17.545563</td>
<td>(5,37)</td>
<td>0.0000</td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>58.330367</td>
<td>5</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

*Source: Results of Processing Eviews 9, 2017*

The Chow Test Hypothesis is: H0: Common Effect Model, Ha: Fixed Effect Model. The output shows that the probability value of the Chi-Square cross-section is 0.0000 smaller than 0.05, so the null hypothesis is rejected. Which means that the fixed effect model is better than the common effect model.

**Hausman Test**
The Hausman test is useful for choosing between random effect models or fixed effect models.

**Table 5: Hausman Test Results**

<table>
<thead>
<tr>
<th>Correlated Random Effects - Hausman Test</th>
<th>Pool: SAHAMRANDOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test cross-section random effects</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>87.727817</td>
<td>5</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

*Source: Results of Processing Eviews 9, 2017*

The Hausman Test Hypothesis is: H0: Random Effect Model, Ha: Fixed Effect Model. Output shows that the probability value of a cross-section random is 0.0000 smaller than 0.05 so
the null hypothesis is rejected. This means that the fixed effect model is better than the random effect model.

**Lagrange Multiplier (LM) Test**

To choose between the common effect model and the random effect model, the Lagrange Multiplier test is used. From the results of the Chow test and the Hausman test, it has shown consistent results regarding the model that can be used in the research model. However, to ensure that Lagrange Multiplier can be tested to determine the model that is well used in the study.

**Table 6: Lagrange Multiplier Test Results**

<table>
<thead>
<tr>
<th>Breusch-Godfrey Serial Correlation LM Test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
</tr>
<tr>
<td>Obs*R-squared</td>
</tr>
</tbody>
</table>

*Source: Results of Processing Eviews 9, 2017*

The hypothesis of the Lagrange Multiplier (LM) test is: H0: Common Effect Model, Ha: Random Effect Model. Based on LM test output from eviews, the p-value of 0.1198 is greater than 0.05, so the null hypothesis cannot be rejected. This means that the common effect model is better than the random effect model.

**Testing Model**

**Table 7: Results of the Fixed Effect Regression Equation**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficien_t</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.337493</td>
<td>0.347271</td>
<td>3.851443</td>
<td>0.0005</td>
</tr>
<tr>
<td>SIZE?</td>
<td>-0.013720</td>
<td>0.012559</td>
<td>-1.092415</td>
<td>0.2817</td>
</tr>
<tr>
<td>PROF?</td>
<td>0.430375</td>
<td>0.162823</td>
<td>2.643218</td>
<td>0.0120</td>
</tr>
<tr>
<td>TANG?</td>
<td>-0.316593</td>
<td>0.174331</td>
<td>-1.816049</td>
<td>0.0775</td>
</tr>
<tr>
<td>NDT?</td>
<td>-2.385336</td>
<td>3.468996</td>
<td>-0.687616</td>
<td>0.4960</td>
</tr>
<tr>
<td>LIQUID?</td>
<td>-0.202478</td>
<td>0.027245</td>
<td>-7.431660</td>
<td>0.0000</td>
</tr>
<tr>
<td>Fixed Effects (Cross)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_ADHI--C</td>
<td>0.140780</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_JKON--C</td>
<td>-0.066569</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_DGIK--C</td>
<td>-0.149184</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Using the EVIEWS 9 program, the results of the Fixed Effect model are obtained in Table 7 which results in the panel data regression equation as follows: Leverage = 1.337493 - 0.013720 Firm Size + 0.430375 Profitability - 0.316593 Tangibility - 2.385336 NDTs - 0.202478 Liquidity + \( \varepsilon_{it} \).

According to the results of the fixed effect regression, information can be obtained that the adjusted R-squared value is 0.955009 or 95.5%. This means that the dependent variable (leverage) can be explained by the independent variable (firm size, profitability, tangibility, non-debt tax shield and liquidity) of 95.5% while the remaining 4.5% is explained by other variables not in the research model.

**Hypothesis Testing and Discussion**

**Test Results t**

The t test is used to test the effect of independent variables (firm size, profitability, tangibility, non-debt tax shield and liquidity) on partial (individual) dependent variables (alpha) with alpha 5%.

The following are the results of testing the significance of the t test obtained from each regression equation:
Hypothesis 1: There is a significant effect of firm size on leverage

In table 7, the results of hypothesis testing show a probability value of firm size of 0.2817 which is greater than the alpha value of 0.05, so H01 cannot be rejected and Ha1 is rejected. So, it can be concluded that the firm size does not have a significant effect on the levers of building construction companies for the period 2008-2015. There is a negative relationship between firm size and leverage indicated by the regression coefficient of -0.013720. So, the relationship between firm size and lever in this study is in accordance with the pecking order theory. The bigger the firm size, the company will have smaller asymmetric information, because the company is more transparent in disclosing the condition of financial statements to external parties, then the agency cost of the company will be smaller than companies that have high asymmetric information. Thus, the opportunity to issue undervalued shares is reduced and the company will prefer to use equity as a source of financing.

The results of this study support the research conducted by Ozkan (2001), Titman and Wessels (1988), which states that firm size does not have a significant effect on leverage.

Hypothesis 2: There is a significant effect of profitability on leverage

In table 7, it also shows the probability value of profitability of 0.0120 smaller than the alpha value of 0.05, then H02 is rejected and Ha2 cannot be rejected. So, it can be concluded that profitability has a significant effect on leverage on building construction companies for the period 2008-2015. There is a positive relationship between profitability and leverage as indicated by the regression coefficient of 0.430375. So, the relationship of profitability with lever in this study is in accordance with the trade-off theory. The higher the profitability of the company, the more likely the company is to issue debt as it reduces tax obligations. In addition, companies with high profitability ratios have less risk of bankruptcy and financial difficulties. In addition, debt providers will be more willing to provide loans to profitable companies because the default profitability is low.

The results of this study support the research conducted by Yusuf et al (2013), which states that profitability has a significant influence on leverage.
**Hypothesis 3: There is a significant effect of tangibility on leverage**

The probability value of tangibility in table 7 is 0.0775 greater than alpha value 0.05, then H03 cannot be rejected and Ha3 is rejected. So, it can be concluded that tangibility does not have a significant effect on levers on building construction companies for the period 2008-2015. There is a negative relationship between tangibility and leverage as indicated by the regression coefficient of -0.316593. This is assessed because companies with high tangibility indicate that the company already has stable resources to generate profits, so that in accordance with the pecking order theory, the company will use internal funds to meet financing needs compared to using external funds.

The results of this study support the research conducted by Olayinka (2011), Lim (2012), Bayrakdaroglu et al (2013), Serghiescu, L. & Vaidean, V.L. (2014), Temile et al (2016), which states that tangibility does not have a significant effect on leverage.

**Hypothesis 4: There is a significant effect of non-debt tax shields on leverage**

Based on table 7, the results of hypothesis testing show the probability value of a non-debt tax shield of 0.4960 greater than the alpha value of 0.05, then H04 cannot be rejected and Ha4 is rejected. So, it can be concluded that non-debt tax shields have no significant effect on leveraged companies in building construction companies for the period 2008-2015. There is a negative relationship between non-debt tax shield and leverage indicated by a regression coefficient of -2.385336. Debt financing is less attractive if there is a non-debt tax shield in the company, such as investment or depreciation. Companies can use non-interest items to reduce their tax bills. In other words, according to the trade-off theory, companies with higher non-debt tax shields tend to use less debt.

The results of this study support the research conducted by Memon, et al (2015), Lim (2012), Ozkan (2001), which states that non-debt tax shields do not have a significant effect on leverage.

**Hypothesis 5: There is a significant effect of liquidity on leverage**

The results of testing the hypothesis in table 7 shows the probability value of liquidity of 0.0000 smaller than the alpha value of 0.05, then H05 is rejected and Ha5 cannot be rejected. So, it can be concluded that liquidity has a significant effect on leverage in building
construction companies for the period 2008-2015. There is a negative relationship between liquidity and leverage as indicated by the regression coefficient of -0.202478. Based on the pecking order theory, companies with sufficient liquidity can use available funds internally to finance investments. Internal funds are the most preferred source of capital for companies. Therefore, companies are more likely to make reserves of retained earnings. Companies that are able to convert their assets into cash, use these inflows to finance their investments rather than using debt.

The results of this study support the research conducted by Temile, et al (2016), Serghiescua (2014), Yusuf et al (2013), which states that liquidity has a significant effect on leverage.

F Test Results

Hypothesis 6: There is a significant influence between firm size, profitability, tangibility, non-debt tax shield, and liquidity together towards leverage.

Viewed from table 7 the results of the regression regression model above, the probability value (F-statistic) is 0.000000 which is less than the alpha value of 0.05, so that H06 is rejected and Ha6 cannot be rejected. Thus, it can be concluded that there is a significant influence between firm size, profitability, tangibility, non-debt tax shield and liquidity together towards leverage. So, based on the trade-off theory, optimal leverage is a balance between tax benefits from debt and bankruptcy costs and agency costs incurred by the company.

CONCLUSION

Based on the results of the analysis and discussion, conclusions are obtained as follows:
There is a negative relationship between firm size and leverage indicated by the regression coefficient of -0.013044. Firm size does not have a significant effect on suppliers to building construction companies listed on the Indonesia Stock Exchange for the period 2008-2015. There is a positive relationship between profitability and leverage which is indicated by the regression coefficient of 0.430375. Profitability has a significant effect on levers on building construction companies listed on the Indonesia Stock Exchange for the period 2008-2015.
There is a negative relationship between tangibility and leverage as indicated by the regression coefficient of -0.316593. Tangibility does not have a significant effect on leverage in building construction companies listed on the Indonesia Stock Exchange for the period 2008-2015.

There is a negative relationship between non-debt tax shields and leverage indicated by the regression coefficient of -2.385336. Non-debt tax transfers do not have a significant effect on leverage in building construction companies listed on the Indonesia Stock Exchange for the period 2008-2015.

There is a negative relationship between liquidity and leverage which is indicated by a regression coefficient of -0.202478. Liquidity has a significant effect on leverage for building construction companies listed on the IDX for the period 2008-2015.

There is a significant influence between firm size, profitability, tangibility, non-debt tax shields and liquidity jointly on leverage to building construction companies listed on the Indonesia Stock Exchange for the period 2008-2015.

**Policy Implications**

The implications of the results of this study are intended for managerial / practitioners, policies and subsequent research as follows:

For Investors: This research can be used as a guide for investors on the IDX to focus on the determinants of the capital structure above before making an investment decision in a company's stock. This study also recommends that investors monitor firm size, profitability, tangibility, non-debt tax shields and liquidity that can affect company leverage before investors expand their portfolios.

For Companies: Companies can pay more attention to factors that influence leverage so that they can increase the optimal value of companies that can increase the value of shares in the stock market.

For Company Management: Management of a company which in this case is usually represented by a manager can pay more attention to the planning and implementation of funding activities within the company in order to provide economic benefits and support the company's financial performance for the company's progress in the future.
For Academics: This research is expected to be one of the references and knowledge for students and related parties in the field of academics the factors that influence the value of the company.

Limitations And Suggestions For Further Research
The researcher realized that the results of this research were far from perfect. This is because there are still limitations to the research, namely the sample in research is only building construction companies listed on the Indonesia Stock Exchange, so that it only has specifications in the type of business of the sample company, so the influence of independent variables only illustrates the influence specifically in building construction. And also this research is limited to observations with the number of shares consisting of only 6 shares. This research is also limited in determining variables, namely each only 5 ratios of firmsize, profitability, tangibility, non-debt tax shield and liquidity to predict leverage.

Suggestions or recommendations that can be given for further research include increasing the research population and expanding the period of the study period, not only in the building construction sector but also other industries such as manufacturing industries or companies engaged in financial services. As well as adding independent variables that are thought to have an influence on the dependent variable (leverage) such as Research and Development, reputation, the size of the board of directors, business risk and managerial ownership.

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Myers, S. C., dan Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, 13(2), 187-221. [https://doi.org/10.1016/0304-405X(84)90023-0](https://doi.org/10.1016/0304-405X(84)90023-0)


