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Capital Structure Determinants of Construction Firms: Does Firm Size Moderate the Results?

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ABSTRACT

Firstly, this paper highlights how the firm-specific factors and external macroeconomic variables affect the capital structure. Secondly, it highlights the effect of firm-specific factors and external macroeconomic variables on capital structure with the firm size as the moderating variable. The population of this study is construction companies listed on the Indonesia Stock Exchange. By employing the purposive sampling method, we used 30 data panels as the research sample covering the period from 2009 to 2014. To analyze the data, we used Moderated Regression Analysis. The research results showed that the factors which significantly determine the capital structure are profitability, liquidity, inflation, and GDP. Meanwhile, tangibility does not affect the capital structure. When the firm size is included as the moderating variable, the tangibility factor, profitability, inflation, and GDP significantly affect the capital structure. Meanwhile, the liquidity factor does not affect the capital structure.

INTRODUCTION

The main goal of every company is to maximize the welfare of the owners, commonly known as the firm value (Widyaningsih et al., 2017). So, in making any decision, the firm should carefully consider many factors in order to maximize the firm value. According to Soekarno et al. (2016) the composition of debt and equity should be maintained so it will minimize the cost of capital to a certain level. Thus, it will maximize the investment value leading to the firm value. Therefore, to maximize the shareholder value, companies must be able to determine an optimal proportion of debt and equity as the main financing sources. Financing decision and investment decision are the decisions in the company activities to increase shareholder value. To perform investment and operating activities, companies require capital or funding. Therefore, in the financial management, capital is a vital variable. The company's source of capital can be from within or outside the com-

pany. The capital from within the company is the owner equity and retained earnings, while the capital from outside the company is debt. The combination of these two sources of financing is known as the capital structure.

According to Chiang et al. (2010), the research on the capital structure has long been one of the main topics of the corporate finance researchers. Although the research number in this field is quite extensive, only a few relevant literature found in the field of construction. Meanwhile, the increasing infrastructure development in Indonesia makes the construction sector progress fast enough, alluring to the local and international construction firms. The construction sector is still attractive because it is closely related to the infrastructure sector. In 2015, the construction market was projected to grow by 14.26% (worth 446 IDR trillion[1]) and in 2018 it is projected to grow to 451 IDR trillion[2], making this sector to be one of the most promising sectors. Drobetz & Wanzenried (2006) stated that in determining the debt policy, the main purpose of the company is not only to minimize the weighted average cost of capital (WACC), but also to achieve financial flexibility. Leverage becomes a proxy for capital structure in various studies (Al Ani & Al Amri, 2015; Rossi, 2014; Wahab & Ramli, 2014; Sheikh & Wang, 2011; Omran & Pointon, 2009; Al-Najjar & Taylor, 2008; Eriotis et al., 2007). Therefore, the important point that must be considered by the company is seeking the determinants of capital structure.

There are several capital structure theories which explain the preference and behavior of the companies in accordance with their corporate financing. Among the well-known theories are the Pecking Order Theory and the Trade-Off Theory. The first was founded by Myers & Majluf (1984) and based on the information asymmetry between investors and company managers. This theory does not suggest an optimal capital structure as a target, but the company should use the preference for using internal and not external sources as a starting point. The second theory is the Trade-Off theory which came from the debate of Miller and Modigliani theorem (Modigliani & Miller, 1963). The corporate income tax is added to the irrelevance of the original theory which in turn creates a profit for the debt. Trade-Off theory assumes that the company trades the profits, cost of debt and equity. This theory seeks an optimal capital structure by taking into account the tax benefits, bankruptcy costs and agency costs. Those theories above help us to understand the nature of the company's capital structure and identify the internal and external factors.

The goal of achieving an optimal capital structure can be hampered by many factors. The option whether to use debt or equity is affected by several factors. Several factors have been identified in the literature called as the firm-specific factors. These are the tangibility of assets, profitability, liquidity, and others (Al Ani & Al Amri, 2015; Alipour et al., 2015; Alom, 2013; Bhayani, 2005), external macroeconomic variables such as inflation, gross domestic product, and others (Khanna et al., 2015; Muthama et al., 2013; Hanousek & Shamshur, 2011), and both firm-specific factors as well as external macroeconomic variables (Chadha & Sharma, 2015; Baltacı & Ayaydın, 2014; Bayrakdaroglu et al., 2013). In addition, the firm life cycle also determines the firm capital structure, specifically its leverage level (Nidar & Utomo, 2017). It is important for companies to interpret these factors and how they affect the capital structure decision.

There has been a long debate about the importance or influence of the company characteristics and macroeconomic variables on capital structure, in which both of these factors play a more dominant role in achieving a goal of optimal capital structure. The literature shows that there is no general consensus on how the company characteristics and macroeconomic variables affect capital structure. Chadha & Sharma (2015) empirically found that tangibility of assets correlate significantly as the major determinants of capital structure in the manufacturing sector of India. Alipour et al. (2015) found that profitability is an important determinant of capital structure of Iranian companies. Malinic et al. (2013) on the other hand highlighted the significance of two debt ratios.

[1] Available at http://www.republika.co.id/berita/ekonomi/makro/15/03/10/nkyndp-tahun-ini-sektor-konstruksi-diproyeksi-tumbuh-rp-446-triliun, accessed Mar 3, 2018

[2] Available at https://finance.detik.com/infrastruktur/3815604/pengusaha-pasar-konstruksi-ri-diproyeksi-capai-rp-451-t-di-2018, accessed Mar 3, 2018

Lemma & Negash (2013) found that there is a correlation between inflation and leverage. The recent literature related to the influence of GDP on leverage was conducted by (Cook & Tang, 2010). Drobetz & Wanzenried (2006) in their research found that the changes in the capital structure have relationship with firm size. The role of firm size in forming an optimal leverage indicates that this variable also affects capital structure of the company. In addition, they stated that this condition may occur because large companies will get more attention from analysts, so the information regarding the companies is available extensively. Thus, it will minimize the asymmetric information between shareholders and company managers. In addition, an extensive information about the company will make it easier for the company to access necessary financing. Such convenience and benefits reduce the cost to make adjustments. If we connect it with the Trade-Off theory (Myers & Majluf, 1984), the little adjustment costs will accelerate the company to make adjustments. Therefore, the firm size is regarded as a moderator between leverage and independent variables in the empirical model.

This research aims to first study the factors which influence capital structure. These factors are firm-specific factors (tangibility, profitability, liquidity) and external macroeconomic variables (inflation, GDP). Secondly, this research aims to examine whether the firm size moderates the capital structure determinants of construction companies listed on the Indonesia Stock Exchange covering the period of six years (2009-2014).

1. METHODS

The population of this study is construction companies listed on Indonesia Stock Exchange (IDX) publishing the full financial statements. In 2014, there were nine construction companies listed on IDX. Sample selection is done by utilizing purposive sampling method. This method is chosen to obtain representative sample in accordance with predetermined criteria. The first criteria for the sample in this study is the construction companies listed on Indonesia Stock Exchange in 2009-2014. The second criteria is they must have published full financial statements for six years, i.e. 2009-2014. The companies which were delisted from the Indonesia Stock Exchange in the period 2009 to 2014 are not included in the sample. There were five companies in accordance with the criteria explained earlier. The variables used in this study can be seen in Table 1.

Table 1. Research Variables

Variables	*Code*	*Measure*	*Empirical Evidence*
Capital Structure	LEV	Total debt / total assets	(Al Ani & Al Amri, 2015; Alipour et al., 2015; Sheikh & Wang, 2011)
Tangibility	TANG	Fixed assets / total assets	(Alipour et al., 2015; Chadha & Sharma, 2015; Al Ani & Al Amri, 2015)
Profitability	PROF	EBIT / total assets	(Alipour et al., 2015; Chadha & Sharma, 2015; Al Ani & Al Amri, 2015)
Liquidity	LIQ	Current assets / current liabilities	(Alipour et al., 2015; Chadha & Sharma, 2015; Mouamer, 2011)
Inflation	INF	Consumer Price Index (CPI)	(Chadha & Sharma, 2015; Baltacı & Ayaydın, 2014; Lemma & Negash, 2013)
GDP	GDP	Real GDP	(Chadha & Sharma, 2015; Baltacı & Ayaydın, 2014; Lemma & Negash, 2013)
Firm Size	SIZE	Natural logarithm of total assets	(Alipour et al., 2015; Chadha & Sharma, 2015; Al Ani & Al Amri, 2015)

To test the hypothesis, we use Moderated Regression Analysis (MRA). This regression model is a specialized application of multiple linear regression which in the regression equation contains an element of interaction (Suteja et al., 2017). The models used in this study are as follows:

$$LEVit = \alpha 0 - \beta 1TANGit + \beta 2PROFit - \beta 3LIQit + \beta 4INFit + \beta 5GDPit + \varepsilon it \ldots (1)$$

$$LEVit = \alpha 0 + \beta 1TANGit + \beta 2PROFit + \beta 3LIQit + \beta 4INFit + \beta 5GDPit + \beta 6SIZEit + \beta 7TANGit * SIZEit + \beta 8PROFit * SIZEit + \beta 9LIQit * SIZEit + \beta 10INFit * SIZEit + \beta 11GDPit * SIZEit + \varepsilon it \ldots (2)$$

2. RESULTS AND DISCUSSION

An optimal capital structure is the main focus of this research. A sample consisting of five companies with a 6-year observation period (2009-2014) results in 30 panel data. The results in Table 2 indicate that the variable of tangibility or asset structure of the company has a negative effect on capital structure, but it is not statistically significant. This means, the test results in model 1 are in line with the research of Lemma & Negash (2013) stating that the tangibility has a negative effect on the capital structure. This indicates that the company offers its asset structure to obtain either the long-term or short-term financing. However, hypothesis 1 stating that tangibility negatively affects capital structure is not accepted because statistically, the t-calculated value is in the area of rejecting the hypothesis. The test results of profitability showed that profitability has a positive effect on the capital structure and it is significant at 1% significance level. This result is in line with Alipour et al. (2015); Chadha & Sharma (2015); Liang et al., (2014), who proved that profitability has a positive and significant impact. In other words, the second hypothesis proposed in this study is accepted.

Table 2. Test Results of t-Statistic for Model 1

No.	*Variable*	*t-calculated value*	*t-table*	*Information*
1	TANG	-0.346889	(α = 1 percent) 2.787436 (α = 5 percent) 2.059539 (α = 10 percent)1.708141	Not Significant
2	PROF	4.76595		Significant***
3	LIQ	-11.30452		Significant***
4	INF	-2.550627		Significant**
5	GDP	-1.9964		Significant*

Source: Data processing using EViews 9.0

Note: *) significant at α = 10 percent
**) significant at α = 5 percent
***) significant at α = 1 percent

Based on empirical data, it is shown that the variable of liquidity has a negative and significant effect on dependent variable with significance level of 1%. This proves that the hypothesis stating that liquidity has a significant and negative effect on the capital structure is accepted. Companies with a good and optimal liquidity certainly have a lot of cash inflows so they would prefer to use cash flows for financing every investment rather than using outside resources of funding (debt). This result is in line with Malinic et al. (2013); Eriotis et al. (2007). Based on the test results, it is found that inflation variable has a negative and significant effect on the dependent variable with significance level of 5%. Or it can be said that the hypothesis is accepted. This empirical result is in line with Baltacı & Ayaydın (2014); Chipeta & Mbululu (2013); Bayrakdaroglu et al. (2013), stating that the high inflation rate makes the company more careful in determining the source of funding. In addition, to reduce the risk, the companies tend to use internal financing rather than debt. Empirical results in Table 2 indicate that GDP growth has a negative and significant effect on the de-

pendent variable with the significance level of 10%, or in other words the hypothesis 5 is accepted. This result is in line with Ukaegbu & Oino (2014); Bayrakdaroglu et al. (2013) stating that when a country's economic growth, reflected through the GDP increases, the companies within that country will make adjustments to that change leading to the non-optimal capital structure.

From Table 3 we know that the hypotheses stating 'the firm size weakens the negative effect of tangibility on the capital structure' is accepted at a significance level of 1%. This finding is consistent with the research results of Soekarno et al. (2016) stating that a large company will have the opportunity and access to bind the market through the economies of scale that it has. In addition, the company with a large scale has the opportunity to improve its capital structure. In other words, the larger the firm size is, the smaller the negative impact of the asset management of the company's capital structure becomes. The subsequent test results showed that the firm size is able to weaken the negative influence of profitability on the capital structure, or it can be said that hypothesis is accepted at the 5% significance level. The result is consistent with Alipour et al. (2015); Chadha & Sharma (2015); Rossi (2014), stating that the large firm size will provide an opportunity for that company to be able to choose its source of financing. The notion behind this is, the company with a large number of assets gains the confidence from investors to obtain financing through debt. In other words, the company with a large asset structure will have a relatively higher leverage level.

Table 3. Test Results of t-Statistic for Model 2

No.	*Variable*	*t-calculated value*	*t-table*	*Description*
1	TANG	4.690734	(α = 1 percent) 2.84534 (α = 5 percent) 2.085963 (α = 10 percent) 1.724718	Significant***
2	PROF	-2.209774		Significant**
3	LIQ	-1.376279		Not Significant
4	INF	3.525123		Significant***
5	GDP	2.523777		Significant**
6	TANG * SIZE	-4.468533		Significant***
7	PROF *SIZE	2.510232		Significant**
8	LIQ * SIZE	0.829283		Not significant
9	INF * SIZE	-3.633406		Significant***
10	GDP * SIZE	-2.386106		Significant**

Source: Data processing using EViews 9.0

Note: *) significant at α = 10 percent

**) significant at α = 5 percent

***) significant at α = 1 percent

The liquidity test interacted with the firm size on capital structure shows empirical results that hypothesis is not accepted. Thus, this implies that the Pecking Order theory prevails because when the firm liquidity is good (high), that firm will chose internal source of financing instead of using debt. In other words, the moderating effect of firm size is not real when the firm liquidity is in an excellent condition. This result is in line Alipour et al. (2015); Malinic et al. (2013); Eriotis et al. (2007). They found that when the firm liquidity proxied by the current ratio, quick acid ratio and working capital ratio is high, the firm would prefer to finance its investments using its current assets instead of using outside financing (debt).

The test of moderating effect of firm size and inflation rate on capital structure shows empirical results that the firm size is able to weaken the negative influence of inflation on the capital structure. In other words, the hypothesis is accepted. According to the Agency Theory, the large firm size will result in adjustment cost when the inflation increases. Inflation will lead to uncertain

economic circumstance and under this condition, the company will tend to choose debt as a financing alternative. This result is consistent with Baltacı & Ayaydın (2014); Chipeta & Mbululu (2013).

The test of the moderating effect of firm size and GDP on the capital structure shows that the firm size is able to weaken the negative effect of GDP on capital structure. So, the hypothesis is accepted. This means the asset of a firm indicating the firm size shall have an effect in deciding the firm capital structure, as long as the economic condition reflected in GDP is in good condition. If the GDP increases, the firms tend to choose the internal source of capital than the leverage. This result is in line with Ukaegbu & Oino (2014); Bayrakdaroglu et al. (2013).

CONCLUSION

In making the financing decision, the decision makers such as managers, board of directors and investors should consider the determinants of capital structure. The factors significantly affect the capital structure are profitability, liquidity, inflation and GDP. Meanwhile, the factor which statistically does not affect the capital structure significantly is tangibility. Of the factors significantly affecting the capital structure, only profitability which affects the capital structure positively. It means, if the profitability increases, the capital structure also increases, vice versa. Inversely, liquidity, inflation, and GDP have a negative effect on capital structure. The variables affecting the capital structure significantly through firm size as the moderating variable are tangibility, profitability, inflation and GDP. Meanwhile, liquidity has insignificant effect on the capital structure.

The results of this research can become the input for the management of construction firms, this research is useful as it can be the input in determining the appropriate capital structure. The management should maintain the leverage level to a certain limit. Thus, the management should pay a close attention to the firm size when deciding the financing decision in order to reduce the risk of capital shortage. To the investors, this research is beneficial in determining the investment choice so they can maximize the returns. The firms with a mid-level of debt shall give a higher return to the investors. Thus, the investors may consider the firm-specific factors and external macroeconomic variables.

The sample used in this research is only the construction firms listed on the Indonesian Stock Exchange. So, the further research may be conducted by using other industries to explore more information regarding the effect of the variables affecting the capital structure. The further research may also be conducted by using other proxies or adding more variables, sample size and research period to get a better result.

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