The Effects of Profitability, Liquidity, Tangibility, Firm Size, and Asset Turnover on Capital Structure in Chemical Industry Listed on Indonesia Stock Exchange From 2014 to 2018

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ABSTRACT

The aim of this research was to analyze the effects of firm's financial performance - profitability, liquidity, tangibility, asset turnover, and firm size on capital structure. Sample in this research is 8 out of 13 chemical companies which were listed on Indonesian Stock Exchange (IDX) for five consecutive years (2014 – 2018). This research used purposive sampling method and multiple regression to reveal the contribution of each independent variable to the dependent variable. The result of this research showed that profitability, liquidity, and tangibility had negative effect on capital structure, while the other two variables, firm size and asset turnover, did not affect capital structure.

Keywords: Financial Performance, Firm Size, Capital Structure

1. INTRODUCTION

The industrial revolution has influenced many countries in the management of industries or companies. Today's industrial revolution 4.0 also encourages Indonesia to implement the changes through adjustments and enhancements in regulation, optimization, and innovation. Five out of nine industries listed on Indonesia Stock Exchange (IDX) are fully supported by the government to increase their capabilities in technology, so that they can support the government's goal to become the top-ten of the world's economic power, doubled in the productivity – cost ratio, and increased net exports to 10% of GDP in 2030. One among those five industries is the chemical industry. This sector was chosen by the government based on its evaluation of economic impacts and the implementation of eligibility criteria that include the measurements of GDP, trade, potential impacts on other industries, investment size, and the speed of market penetration. The most important criterion considered by the government is the company's ability to generate profit. In order to obtain a specified profit, a company has to decide the optimal way to manage the capital, one of them is to use the financing derived from the debt. According to the trade–off theory, a company should determine a favorable debt-ratio based on the trade–off between the cost and the benefit of debt and equity. If its financing mix is wrong, the performance of company would be seriously affected (Imtiaz et.al, 2016). Based on the pecking-order theory, once the internal sources of funds are exhausted, a company will use debt which is less risky. Besides long–term debt, a company can also rely on short–term debt for its financial structure (Nistor, 2004) in Serghiescu et.al (2014).

Serghiescu et.al, (2014) classified the factors that affect the capital structure into two categories, which are : (1) the internal factors specific to a company, such as profitability, liquidity, tangibility, firm size, asset turnover, and (2) the external factors reflecting country-specific macroeconomic conditions, such as inflation-rate and average interest-rate. Previous studies conducted by Buvanendra et.al, (2017), Imtiaz et.al, (2016), Serghiescu et.al, (2014), and Abdou et.al, (2012), stated that there are various factors that might have an effect to debt-ratio, including profitability, liquidity, tangibility, firm size, and asset turnover. It is expected that profitability and liquidity negatively affect the capital structure (debt-ratio), while tangibility, firm size, and asset turnover positively affect the capital structure (Serghiescu et.al, 2014). Therefore, those factors will be used in this paper as independent variables in order to study their effects on capital structure.

The objective of conducting this research is to know whether financial performance (profitability, liquidity, tangibility, asset turnover) and firm size affect the capital structure of among chemical firms in Indonesia. The dependent variable, capital structure, was measured by Debt-to-Asset Ratio (DAR), while the independent variables were measured by profitability, liquidity, tangibility, firm size, and asset turnover. This paper is organized as follows: Section 2 discusses the literature review of factors that affect the capital structure, Section 3 explains the methods of data collection and data analysis, Section 4 provides the results of this research by using multiple regression analysis, and finally Section 5 summarizes the conclusion of this research.

2. LITERATURE REVIEW

The trade-off theory emerged from the Modigliani–Miller theory, which stated that up to the point whereas the marginal value of the tax-shield is equal to the present value of the bankruptcy cost, the firm will keep trying to make loans to external parties (Myers, 2001) in Serghiescu et.al (2014). The optimal level of company's debt reflects an equilibrium between the bankruptcy cost and the tax-benefit of debt (Kraus and Litzenberger, 1973) in Serghiescu et.al (2014). Correia et.al (2000) in Handoo (2014) concluded that the existence of bankruptcy cost reduces the value of tax-shield.

Agency cost theory is derived from risk aversion and information asymmetries. Jensen and Meckling (1976) in Buvanendra (2017) identified the two types of conflicts, which are those between shareholders and managers, and those between debtholders and shareholders. In order to minimize this problem, Jensen (1986) in Buvanendra (2017) argued that by increasing debt, managers contractually bind themselves to pay-out debt first, which would reduce the available cash flow to them (managers) and profit the company could earn.

The pecking-order theory (Myers and Majluf, 1984) in Buvanendra (2017) emphasises the hierarchical choices of financing, so companies prefer to finance their investment by internal resources and then by borrowed capital, and finally by using the equity provided by shareholders (Serghiescu et.al., 2014).

Market-timing theory stated by Baker and Wurgler (2002) in Serghiescu et.al (2014) showed that some specific conditions of the capital market and the macroeconomic conditions within a country may affect the capital structure of the companies listed on stock exchange. A company tends to issue equity instead of debt. when its market value is high (Baker and Wurgler, 2002).

2.1 Profitability and Capital Structure

The pecking-order theory predicts a negative correlation between the profitability of a company and its total level of debt based on the idea that companies would first prefer the internal funding resources (which is the profit) (Myers and Majluf, 1984) in Serghiescu et.al (2014). In other words, a profitable company tends to have lower external financing, therefore would have lower debt. Amidu (2007) in Imtiaz et.al (2016) concluded the negative relation between profitability and debt. Friend et.al (1988), Titman et.al (1988), and Kester (1986) in Ullah et.al (2017) obtained a finding that profitability has a negative influence on leverage. Handoo (2014) concluded that profitability produced a significant impact on total debt. Booth et.al (2001) in Buvanendra (2017) also confirmed that profitability has a negative correlation to capital structure. On the other hand, the trade–off theory conclude a positive correlation between both variables given that a company's higher profitability implies a higher income that can be exempted from taxes (Kraus and Litzenberg, 1973) in Serghiescu et.al (2014). Research by Acaravci (2015) stated

that more profitable firms should have higher leverage, because they have more income to shield from the taxes. Similar with that, La Rocca et al. (2009) in Vo (2017) said that more profitable firms are more likely to borrow more in order to benefit from the tax-shield. Among those researches, many empirical studies concluded a negative effect of the profitability on capital structure based on the pecking-order theory.

H_1 : Profitability has a negative effect on capital structure.

2.2   Liquidity and Capital Structure

According to the pecking-order theory, firms with high liquidity levels can finance their investments (Ozkan, 2001) in Serghiescu et.al (2014). Sbeti and Moosa (2012) in Vo (2017) found a negative link between liquidity and financial leverage for capital structure decision based on the pecking-order theory. Ullah et.al (2017) stated that liquidity ratios have both positive and negative effect on the capital structure decision, so that the net effect is unknown. First, firms with high liquidity ratios may have relatively higher debt-ratios due to their greater ability to meet short-term obligations. This argument suggests a positive relationship between liquidity of a firm and its debt-ratio. Alternatively, firms with more liquid assets may use such assets as sources of financing to fund their future investment opportunities. A further argument for a negative relationship is provided by Myers and Rajan (1998) in Ullah et.al (2017), who argued that when agency costs of liquidity are high, outside creditors limit the amount of debt financing available to the firm. Thus, a negative relationship between debt and liquidity would be expected. Similarly, the effect of asset liquidity is an ambiguous signal to institutional investors. A high liquidity ratio may be considered to be a negative signal, because it indicates that the firm faces problems regarding opportunities for its long-term investment decisions. Hence, a high liquidity ratio may be considered to be a negative signal for institutional investors. However, a high liquidity ratio may be considered to be a positive signal from the firm, because it indicates that the firm can easily pay its obligations and hence faces lower risk of default. Thus, high liquidity would be a positive signal for institutional investors. Abdou et al. (2012) and Handoo (2014) found statistically that liquidity did not produce significant impact on total debt, but it is negatively related to capital structure. Among those arguments, it can be concluded that the liquidity of a company should exercise a negative impact on the leverage (Ozkan, 2001) in Serghiescu et.al (2014) based on the pecking-order theory.

H_2 : Liquidity has a negative effect on capital structure.

2.3   Tangibility and Capital Structure

A company possesses fixed tangible assets to a large extent that can be considered by its creditors as a guarantee that will allow them to recover their funds in case of financial distress experienced by the borrower. Similar with Titman and Wessels (1988), Sbeti and Moosa (2012) in Vo (2017)

stated about the tangible assets that can be used as collateral, so a high fraction of tangible assets could allow the firm to obtain external financing easily resulting in a high leverage. Tangible assets as part of the total assets will be perceived by investors as a positive measure and extending the level of debt in this situation would be something perfectly normal (Nivorozhkin, 2005) in Serghiescu et.al (2014). On the other hand, in developing countries a high percentage of tangible assets in total assets is not a guarantee of recovering the debt issued by lenders, because the underdeveloped legal systems can delay or prevent this procedure in case of bankruptcy. Lima (2009) in Imtiaz et.al (2016) found that tangibility was positively related to the capital structure. Harris & Raviv (1990) and Williamson (1988) in Ullah et.al (2017) also concluded that tangibility is positively correlated with capital structure. In this sense, some empirical studies for developing countries shown that there is a negative correlation between the assets' tangibility and the total leverage (Nivorozhkin, 2002) in Serghiescu et.al (2014).

H_3 : Tangibility has a negative effect on capital structure.

2.4   *Firm Size and Capital Structure*

Based on the agency cost theory stated by Jensen and Meckling (1976), a company with high portion of fixed assets has more opportunities to raise the financing supported with the ability to pay-off their obligations. Titman and Wessels (1988) in Serghiescu et.al (2014) argued that the size of a company and the extent to which it is indebted are positively correlated, motivating that large companies have more diverse activities and therefore, less risk of bankruptcy. In fact, this allows them to reach and maintain a higher level of debt. Similar with that, Sayeed (2011) in Imtiaz et.al (2016) stated that firm size has a positive effect on capital structure. Siddiqui (2012) in Imtiaz et.al (2016) found that firm size has significant influence on the capital structure, and Amidu (2007) in Imtiaz et.al (2016) concluded the negative relation between size and leverage. According to the trade-off theory, firm size could be an inverse proxy for the probability of bankruptcy costs. Larger firms are found to be more diversified and fail less often. They can lower costs (relative to firm value) in case of bankruptcy. Larger firms are more likely to have higher debt capacity and are expected to borrow more to maximize the tax-benefit from debt because of diversification (Titman & Wessels, 1988) in Imtiaz et al., (2016). Therefore, size has a positive effect on leverage. Size can be regarded as a proxy for information asymmetry between managers and outside investors. They should be more capable of issuing equity, which is more sensitive to information asymmetry and have lower debt (Rajan & Zingales, 1995). This suggests that the pecking-order theory predicts a negative association between leverage and firm size.

H_4 : Firm size has a negative effect on capital structure.

2.5   *Asset Turnover and Capital Structure*

According to Serghiescu et.al (2014), assets' turnover is an indicator of efficiency which reflects how many times the capital invested in the total assets rotates in order to achieve the company's turnover. It can be concluded that asset turnover is positively correlated with the level of debt.

H_5 : Asset turnover has a positive effect on capital structure.

3. METHODS

The sampling method used in this research was purposive sampling. The requirements for the sample of this research were the chemical companies listed on Indonesia Stock Exchange (IDX) from 2014 to 2018, and published their annual reports which was available to be access by public. There were eight companies and 200 data in this research analysed by using multiple regression method.

Table 1. Research Samples

No.	Ticker	Company
1	DPNS	Duta Pertiwi Nusantara
2	EKAD	Ekadharma International
3	ETWA	Eterindo Wahanatama
4	INCI	Intanwijaya Internasional
5	SRSN	Indo Acidatama
6	UNIC	Unggul Indah Cahaya
7	BRPT	Barito Pacific
8	TPIA	Chandra Asri Petrochemical

The dependent variable in this research was capital structure, which is how the company funds its operating, investments, and financing activities by using the ratio scale of debt. This method of measurement refers to the research conducted by Serghiescu et.al (2014) by dividing total debt to total asset. Profitability is the financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenditure, cost, and taxes needed to sustain the activity. Earnings Before Interest and Taxes (EBIT) to total asset is used as a measure of profitability, which refers to the research conducted by Serghiescu et.al (2014). Liquidity is the ability to convert an asset to cash immediately and is calculated by dividing the total cash and bank accounts by the total assets, which also refers to the research conducted by Serghiescu et.al (2014). Tangibility refers to the fixed-tangible assets that possess some degree of debt capacity. The formula used in this study to measure the value of tangible assets of the firm is the ratio of net fixed assets to total assets as stated by Serghiescu et.al (2014) in his previous research. Large firms are often more diversified and have more stable cash flow; the probability of default for large firms is smaller compared to that of the smaller firms. Thus, the financial distress risk can be considered lower for larger firms. The measure of a firm size used in this study is the natural logarithm of its total assets as stated by Serghiescu et.al (2014) in his previous research. Asset turnover measures the value of a company's sales or revenues relative to the value of its assets. This variable can

be used as an indicator of the efficiency of which a company is using its assets to generate revenue. It compares the amount of sales or revenue to its total assets, which refers to the research conducted by Serghiescu et.al (2014) as well. Panel data analysis technique and SPSS tools was used in this research. The equation for base-model is displayed as follow:

Debt ratio = $\alpha + \beta_1$ profitability + β_2 liquidity + β_3 tangibility + β_4 firm size + β_5 asset turnover + ε (1)

Table 2. Variable Measurements

No.	Variable	Measurement
1	PROF	Earnings Before Interest and Tax / Total Assets
2	LIQU	Total Cash + Bank Accounts / Total Assets
3	TANG	Net Fixed Assets / Total Assets
4	SIZE	Ln (Total Assets)
5	TATO	Sales / Total Assets
6	CAST	Total Debt / Total Assets

4. RESULTS

These tables below are the model summary and descriptive sample statistics. Table 3 shows the Adjusted R-square that equals to 0.760, meaning that the variation in dependent variable that could be explained by the variation of independent variables are as much as 76 %, while the remaining 24 % of variation is explained by other variables which are not included in the regression model of this research. Table 4 describes the descriptive statistics of this research. There were 108 data being processed.

Table 3. Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.881[a]	.775	.760	.1386760

a. Predictors: (Constant), TATO, LIQU, SIZE, PROF, TANG

Table 4. Descriptive Statistics

		PROF	LIQU	TANG	SIZE	TATO	CAST
N	Valid	108	108	108	108	108	40
	Missing	0	0	0	0	0	68
Mean		11.783984	.364824	94.800360	8.317164	.629489	.392482
Median		13.500000	.381550	8.500000	.332640	.606450	.349638
Mode		18.0000[a]	.3348[a]	15.0000	.0801[a]	.7043	.0767[a]
Std. Deviation		10.2716448	.2270640	212.1085182	11.0654692	.3051785	.2849445

a. Multiple modes exist. The smallest value is shown

Table 5. Hypotheses Test Results [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.424	.164		2.591	.012
	PROF	-.757	.303	-.172	-2.494	.015
	LIQU	-1.039	.173	-.408	-6.002	.000
	TANG	.677	.112	.505	6.055	.000
	SIZE	-.006	.004	-.102	-1.561	.123
	TATO	-.091	.066	-.123	-1.381	.171

a. Dependent Variable: CAST

Table 5 shows that profitability, liquidity, and tangibility had significant effect on capital structure, while the other two variables did not.

H_1 namely "Profitability has a negative effect on capital structure" has beta coefficient equals to - .757, which is not rejected and hence it can be concluded that profitability has a negative effect on capital structure. This result is consistent with Myers and Majluf (1984) in Serghiescu et.al (2014, Kraus and Litzenberg (1973) in Serghiescu et.al (2014), Amidu (2007) in Imtiaz et.al (2016), Friend et.al (1988), Titman et.al (1988), and Kester (1986) in Ullah et.al (2017), and also Booth et.al (2001) in Buvanendra (2017) that confirmed a negative correlation between profitability and capital structure. This result is also consistent with the pecking-order theory, but not consistent with the research

result conducted by (Kraus and Litzenberg, 1973) in Serghiescu et.al (2014), Acaravci (2015), and La Rocca et al. (2009) in Vo (2017) which mentioned the positive effect of profitability on capital structure. Companies in this industry have great financial performance as represented by high profit that could cover their needs of fund.

H_2 namely "Liquidity has a negative effect on capital structure" has beta coefficient equals to – 1.039, consistent with the pecking-order theory, which is also not rejected and hence it can be concluded that liquidity has a negative effect on capital structure. This result is consistent with Myers and Rajan (1998) in Ullah et.al (2017), Abdou et al. (2012), and Ozkan (2001) in Serghiescu et.al (2014). This result supports and confirms the research conducted by Ullah et.al (2017) concluding that liquidity has a negative effect on

capital structure. It means that companies with high liquidity prefer to use internal sources of fund and then they borrow the money from external sources. This result also proves that profitable companies with high level of liquidity will have a reduced level of debt. Different results come from Handoo (2014), who stated that liquidity does not have significant impact on total debt.

H_3 namely "Tangibility has a negative effect on capital structure" has beta coefficient equals to 0.677, which is rejected and hence it can be concluded that tangibility has a positive effect on capital structure. This result is supported by Lima (2009) in Imtiaz et.al (2016), Harris & Raviv (1990) and Williamson (1988) in Ullah et.al (2017). This result breaks the hypothesis stated by Nivorozhkin (2002) in Serghiescu et.al (2014), who said that for developing countries, there is a negative correlation between the assets' tangibility and the total leverage. For chemical companies in Indonesia, tangibility has a positive effect to capital structure, and also supports the market-timing theory, according to which the companies' tangibility will be used to enhance the level of debt.

H_4 namely "Firm size has a negative effect on capital structure" is rejected, reflected by significance level which is higher than 0.05, and hence it can be concluded that firm size does not have significant effect on capital structure. This result is inconsistent with all previous research conducted by Titman and Wessels (1988) in Serghiescu et.al (2014), Sayeed (2011) in Imtiaz et.al (2016), Siddiqui (2012) in Imtiaz et.al (2016), and Amidu (2007) in Imtiaz et.al (2016). Chemical companies in Indonesia have already been established since years ago and the government believes that those companies can perform well in order to fulfil their needs related to the capital structure.

H_5 namely "Asset turnover has a positive effect on capital structure" is rejected, which was also reflected by the significance level which is higher than 0.05, and hence it can be concluded that asset turnover does not have significant effect on capital structure. This result is inconsistent with the previous research conducted by Serghiescu et.al (2014), who concluded that asset turnover is positively correlated with the level of debt.

5. CONCLUSIONS

The results of this research show that profitability, liquidity, and tangibility have significant effects on firms' capital structure. On the other hand, firm size and asset turnover have no significant effect on firms' capital structure. This research has some limitations, which only used five-year period from the year of 2014 to 2018, and the sample only consist of chemical companies listed on IDX. Another research should extend the period of observation, and compare the conditions in different countries. Further research may add other variables such as growth opportunities, age of the firm, financial distress, tax rate, non-debt tax-shield, and debt-serving capacity, so that the independent variables can explain the dependent variable more significantly.

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