



## The Effect of Capital Structure on Profitability of Electricity Companies in Southeast Asia

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### Abstract

Capital structure is increasingly important in determining the optimal combination of funding for investment needs that can increase firm value from profitability. The study aims to examine the effect of capital structure on profitability of electricity companies in Southeast Asia. The study used multiple regression model represented by pooled least square to calculate 48-panel data from the annual financial report during the time period of 2009-2016. We utilized short-term debt to total assets (STD), long-term debt to total assets (LTD), total debt to total assets (TD), and debt to equity ratio (DER) as proxies of capital structure (independent variables). Operating income margin (OIM), return on asset (ROA), and return on equity (ROE) were the profitability proxies (dependent variables). Firm size and firm age were used as control variables in the study. The results of this study indicate that STD and LTD have a negative relationship that consequently has significant effect on LTD and OIM. Other than positive and negative relationships between the capital structure (TD and DER) and profitability, this study also finds that TD and DER have positive significant influence on OIM and ROE, but have negative insignificant relation with ROA. Thus, it is necessary to optimize the capital structure by adjusting the target of capital structure that can provide a balance on the marginal cost and marginal benefit.

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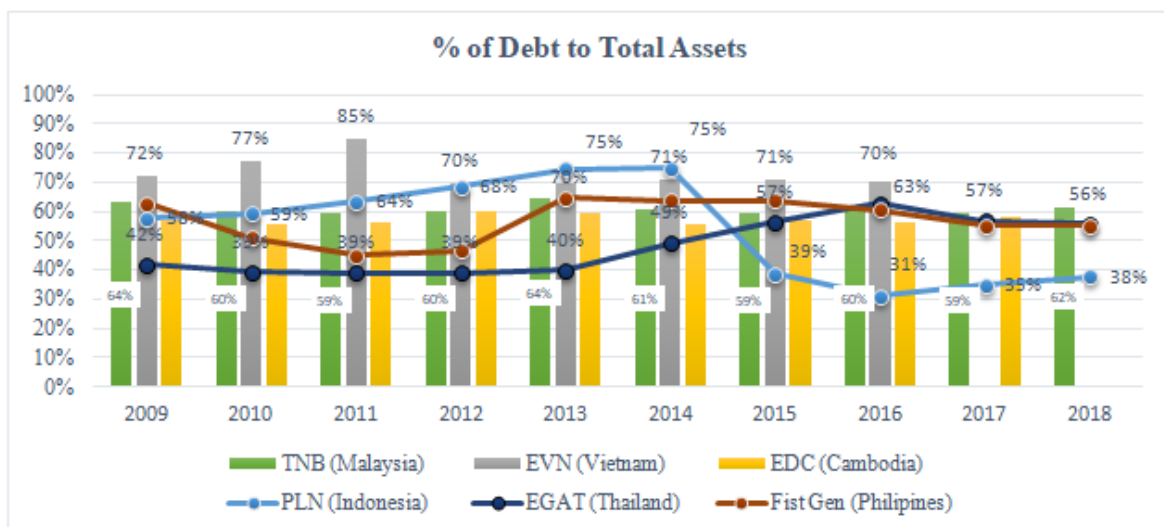
### Introduction

Capital structure is increasingly important in determining the optimal combination of funding for investment needs that can increase firm value from profitability. The capital structure is an interesting and argumentative topic in finance (Tifow & Sayilir, 2015). Generally, existing theories emphasize the importance of maintaining balance between debt and equity, which is then known as the optimal capital structure. Al-Najjar and Hussainey (2011) and Haron (2014) in their research suggested that there is no universally valid consensus regarding perfect debt and equity ratios so that companies can use them referring to perfect debt and equity ratios as guidelines in preparing their capital structure. However, the optimal capital structure can be obtained by balancing the marginal cost and marginal benefits (Graham & Leary, 2011). Decisions in choosing a good capital structure will affect financial performance and company value, and vice versa, an inappropriate decision can bring the company the potential for financial

distress and bankruptcy (Eriotis, et al, 2007); (Tifow & Sayilir, 2015); (Rehman, 2016); (Singh & Kumar, 2012).

From the best literature studies conducted, research related to the effect of capital structure on financial performance is generally carried out on corporations in the manufacturing, agrarian, financial, and other sectors that are listed on the national stock exchange (capital market). However, it is still difficult to find research on the implications of the capital structure on financial performance in companies in the electricity sector. Today, the electricity sector is very important and strategic because the products or services produced are the basic needs of every person so that in some countries, there are regulations that are quite strict in its management. On the other side, the availability of adequate, high-quality, and reliable electricity infrastructure can drive a country's economic growth. Electricity needs in a country are driven by several main factors, namely, economic growth, population growth and electrification programs, and the provision of electricity to support government programs, including “building Industrial Estates, Creative Economy Regions, National Tourism Strategic Areas, Marine Centers, and Integrated Fisheries, and the Cross-Country Electricity Network”. Economic growth is characterized by the increasing output of goods and services and an increase in people's income.

Based on the financial condition of PT PLN (Persero), or Indonesia State Electricity Corporation, in letter number S-781 / MK.08 / 2017 dated September 19, 2017 from the Minister of Finance of the Republic of Indonesia, it is said that the company experienced a decrease in financial performance, along with the increasing obligation of the company to pay the loan principal and interest, which were seen to continue to increase in the next few years, but were not supported by the growth of the company's net cash flow.



**Figure 1.** Debt to total assets of electricity companies in Southeast Asia according to annual reportd

Information on data obtained through the company's annual consolidation report shows a change in the combination of funding sources in the capital structure in the last 10 years. There was a change in the portion of the capital structure between debt and equity of PT PLN (Persero) during 2010 as of 2018. The percentage of debt in the capital structure report changed from 2015 to 2018 in which there was no more than 40% of differences from the previous year, at least 59% (2010). In a different case of debt, equity also experienced a very large increase starting from 2015 to 2018. This was a representation of the funding needs of the company's investment in

carrying out the assignment of national strategic projects in the electricity sector. Changes in the portion of the debt in the capital structure did not only occur in PT PLN (persero) of Indonesia. Electricity companies in Southeast Asia in 2009-2013 had average debt portion above 50%. The percentage debt of Vietnam Electricity (EVN) reached 85% of debt in 2011 and it is also known that only the percentage of debt of the Electricity Generating Authority of Thailand (EGAT) was consistently under 40% up to 2013. The interesting thing about Figure 1 is that there are differences in the trends of debt portion of other Southeast Asian companies such as EGAT and First Gen Company (FGC) of Philippines compared to PT PLN (persero) of Indonesia, both of which were known to experience a change in debt portion from lower to larger portion after 2012. Meanwhile, Malaysian TNB and Cambodian EDC were relatively consistent with a portion of debt between 50-60% from 2009 to 2016.

### **Theoretical Perspective**

MM Theory by Modigliani & Miller (1958) explains this theory concerning the company's ability to generate profits in the future. They argued that the company's ability to generate future profits is not influenced by the size of the capital structure, assuming that there is no tax. Furthermore, in 1963, the MM theory was modified by Merton Miller by considering taxes. Higher debt of a company will lead to greater interest expense so that the tax burden can be reduced. However, companies with high debt levels cause a high burden to be borne by the companies. In addition to disrupting profitability due to high expenses, this can also pose a considerable risk to the company when the company is unable to pay these obligations at maturity.

The pecking order theory proposed by Myers & Majluf (1984) states that corporate funding requires a decision on the level of leverage. The company prioritizes the use of retained earnings to finance its funding. Then, if funding is insufficient, or deficit still occurs, due to a large amount of investment needed, debt is chosen from external parties, where the risk-free debt is chosen first before choosing risky debt. The final choice for companies in investment funding is the issuance of new shares to increase equity. Retained earnings are prioritized because there are relatively almost no costs. If the company takes the action of adding debt or issuing new equity, it can signal national investors in the market. If management issues external equity, it means that the stock is overloaded and the stock price will fall short in the future (Rehman, 2016). M'ng et al. (2017) contained a statement by Frank & Goyal (2002) that pecking order theory is more relevant for large companies because small companies experience a high problem of information uncertainty. Different things are addressed by Byoun & Rhim (2003), where the pecking order theory is relevant to small companies and those who do not pay dividends because of the difficulty of the company in accessing external financing. However, the results of these studies can conclude that the pecking order theory appears as a problem of asymmetric information.

The trade-off theory states that optimal capital structure can be obtained if the net tax benefit from debt funding is balanced with costs related to leverage. The exchange of costs and benefits of guarantee (loan) will determine the optimal debt ratio (Haron, 2014). The optimal capital structure is obtained by using a level of leverage where debt benefits in the form of tax protection are almost the same as the cost of financial difficulties (financial distress costs) arising from debt (Myers & Majluf, 1984). According to static trade-off theory from Kraus & Litzenberger (1973), increasing the weight of debt in the capital structure can increase the risk of bankruptcy resulting from the inability to pay the annual principal and interest from the debt. The dynamic trade-off theory proposed by Fischer et al. (1989) states that the company considers

a range of target leverage and allows the debt ratio to change in the optimal range. Thus, companies that are in imperfect markets tend to have leverage that changes temporarily.

Agency theory explains other problems due to information that is not symmetrical, namely agency problems (Haron, 2014). In the publication of Eriotis et al. (2007), Jensen & Meckling (1976) identified agency problems that arise as a result of conflicts between managers and shareholders and between shareholders and debtholders. Therefore, conflicts between managers and owners cannot be avoided. The agency cost arises due to the efforts of the owner to control and monitor corporate actions.

### **Empirical Evidence and Hypothesis**

The effect of the capital structure on the company's financial performance is unique and different from other companies. There are several differences in the results of empirical research on the effect of capital structure on the company's financial performance with various variables used.

Salim & Yadav (2012) have researched the relationship between capital structure (long-term debt, short-term debt, debt ratios, and growth) with the performance of companies in 237 companies listed on the Malaysian stock exchange in the time period of 1995 to 2011. The results of these studies indicate that company performance, as measured by Return on Assets (ROA), Return on Equity (ROE), and earnings per share (EPS), has a negative relationship with long-term debt (LTD), short-term debt (STD), total debt (TD), as capital structure variables. Furthermore, total debt (TD) has a significant negative effect on the company's financial performance.

Next, Le & Phan (2013) also examined the effect of capital structure on the performance of non-financial companies listed on the Vietnam stock exchange in the period 2007-2012. In line with the research of Salim & Yadav (2012), it was stated that all debt ratios (long-term debt, short-term debt, and total debt) had a significant negative relationship with company performance (ROA, ROE, and Tobin's Q). This result is incompatible with most studies conducted in developed countries, which place a positive relationship between capital structure and company performance. However, they argue that this research is consistent with several studies in the context of emerging markets. Moreover, in a typical developing market such as Vietnam, the benefits of debt from tax savings might be smaller than the financial distress cost.

Suardi & Noor (2015) also examined the effect of the capital structure (debt to equity ratio, debt ratio) on the company's financial performance (gross profit margin, Net profit margin, ROA, ROE, earnings per share). Their study was conducted on 16 samples of registered agricultural companies on the Indonesia Stock Exchange (IDX) during the time period of 2010-2014. Similar to the two studies above, the findings from this empirical study indicate a significant negative relationship between the debt to equity ratio and ROE.

Tifow & Sayilir (2015) examined the relationship of capital structure (short-term debt, or STD, and long-term debt, or LTD) with company performance (ROE, ROA, EPS, Tobin's Q) in 130 manufacturing companies listed on the ISE (Istanbul stock exchange) during the time period of 2008-2013. The results found that STD had a significant negative relationship with ROA, EPS and Tobin's Q ratio. Also, it is known that LTD had a significant negative relationship with ROE, EPS and Tobin's Q ratio, while it was positively and significantly correlated with ROA.

The same results were also found in the Nassar (2016). In his research, it is known a significant negative relationship between the capital structure (debt ratio) and company performance (ROA, ROE, EPS). The data samples in this study were 136 industrial companies listed on the ISE (Istanbul stock exchange) for the time period of 2005-2012.

Different results are known from the research of Addae et al. (2013), which showed a relationship of capital structure (long term debt, short term debt, debt ratios, and growth sales) with company profitability (ROE). The research was conducted on companies listed on the Ghana stock exchange during the period of 2005-2009. Empirical results showed that there was positive, negative, or neutral relationship between profitability and capital structure. That is, the result revealed that there was a statistically significant positive relationship between profitability and short term debt and there was a significant negative relationship between profitability and long-term debt.

Furthermore, Tailab (2014) conducted a study of the relationship of capital structure (short term debt, long term debt, total debt, debt to equity ratio, and firm size) with profitability (ROE, ROA) in energy companies in America during the time period of 2005-2013. The empirical results showed that total debt had a significant negative impact on ROE and ROA. This result is in line with the findings of the study conducted by Salim & Yadav (2012). Meanwhile, short-term debt significantly had a positive effect on ROE. This result is in line with the findings of the study conducted by Addae et al. (2013).

Different results were obtained by Sultan & Adam (2015) who conducted a study of the relationship of capital structure (financial leverage, debt to equity ratio, capital turnover) with the company's profitability (profit margin, ROA, ROE) in four industrial sectors in Iraq in 2004-2013. The research findings showed that the capital structure had a positive significant effect on the profitability of the company. Also, profitability and assets had been found to negatively affect the capital structure of the listed companies. This finding is generally following the predictions of pecking order theory and the signaling effect of the company's capital structure decisions. The company concerned must increase the size of their company which is negatively correlated with ROE, growth, and continuity.

However, several studies link high returns with low debt levels, contrary to the theory of Modigliani & Miller (1958; 1963), which confirms that the value of a company does not depend on the composition of capital and shows the existence of tax benefits from debt.

Based on the literature review and previous research above, the research takes the hypothesis of the effect of capital structure on profitability as follows:

H1: Short-term debt ratio has a positive and significant influence on profitability.

H2: Long-term debt ratio has a negative and significant effect on profitability.

H3: Total debt ratio has a negative and significant effect on profitability.

H4: Debt to equity ratio has a positive and significant effect on profitability.

## Methods

The sample data used was the electricity company in Indonesia (PT PLN) and several other electricity companies in Southeast Asian countries such as Malaysia (Tenaga Nasional Berhad), Thailand (Electricity Generating Authority of Thailand), Philippines (First Gen), Vietnam (Vietnam Electricity), and Cambodia (Electric du Cambodge). Forty eight data were obtained from the companies' annual reports (2009-2016) published through the companies' official websites.

### a. Research Variables

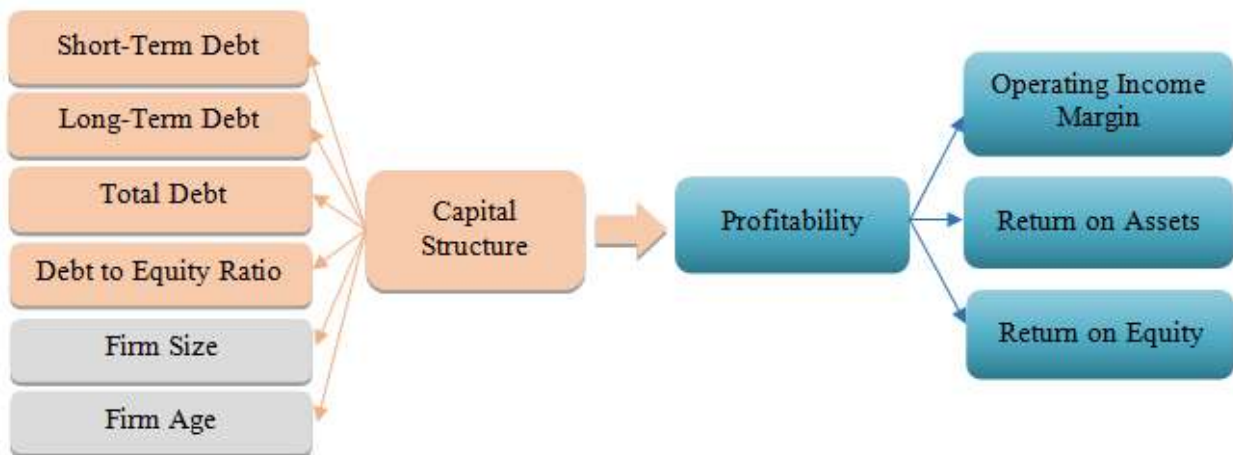
Company profitability can be measured through several ratios that are often used in financial analysis. This study selected profitability ratios that can be an interpretation of financial performance by operating income margin (OIM), Return on Assets (ROA), and Return on Equity (ROE). The independent variable used in this study was a variable that reflected the capital

structure. The capital structure itself consisted of short-term debt (STD), long-term debt ratio (LTD), total debt ratio (TD), and debt to equity ratio (DER). Meanwhile, the size and age of the company became the control variables in this study. All variables are explained in Table 1 below.

**Table 1.** Variables of Research

Variables	Full Name	Measure	References
<b>Dependent</b>			
OIM	Operating Income Margin	Operating Income / Net Sales	Gibson (2010); Sultan & Adam (2015); Suardi & Noor (2015)
ROA	Return on Assets	Net Income / Total Assets	Salim & Yadav (2012); Le & Phan (2013); Tailab (2014); Vätavu (2015)
ROE	Return on Equity	Net Income / Total Equity	
<b>Independent</b>			
STD	Short-Term Debt Ratio	Short-term Liabilities/Total Asset	Salim & Yadav (2012); Le & Phan (2013); Addae et al. (2013); Tailab (2014); Ozioma & Grace (2015); Vätavu (2015); Suardi & Noor (2015); Tifow & Sayilir (2015)
LTD	Long-Term Debt Ratio	Long-term Liabilities/Total Asset	
TD	Total Debt Ratio	Total Liabilities / Total Asset	
DER	Debt to Equity Ratio	Total Liabilities / Total Equity	Gibson (2013); Tailab (2014); Sultan & Adam (2015); Vätavu (2015); Suardi & Noor (2015); Tifow & Sayilir (2015)
<b>Controls</b>			
SIZE	Firm Size (SIZE)	Log of Total Assets	Pervan et al. (2017), Salim & Yadav (2012); Addae et al. (2013); Tailab (2014); Haron (2015); Tifow & Sayilir (2015)
AGE	Firm Age (AGE)	Log of number of years that legal firm operates	Loderer & Waelchli (2010); Pervan et al. (2017) Pervan et al. (2017); Haykir & Çelik (2018)

**b. Research Framework and Models**



**Figure 2.** Research Framework

The regression model explains below:

$$\text{OIM} = \alpha + \beta_1 \text{STDit} + \beta_2 \text{LTDit} + \beta_3 \text{TDit} + \beta_4 \text{DERit} + \beta_5 \text{SIZE} + \beta_6 \text{AGE} + \varepsilon \dots (\text{model 1})$$

$$\text{ROA} = \alpha + \beta_1 \text{STDit} + \beta_2 \text{LTDit} + \beta_3 \text{TDit} + \beta_4 \text{DERit} + \beta_5 \text{SIZE} + \beta_6 \text{AGE} + \varepsilon \dots (\text{model 2})$$

$$\text{ROE} = \alpha + \beta_1 \text{STDit} + \beta_2 \text{LTDit} + \beta_3 \text{TDit} + \beta_4 \text{DERit} + \beta_5 \text{SIZE} + \beta_6 \text{AGE} + \varepsilon \dots (\text{model 3})$$

Where :

$\alpha$  = Constant

$\varepsilon$  = Standard error

$\beta_{1-6}$  = Coefficient of Regression

i & t = Company & time

### c. Data Analysis

Analysis method or data analysis technique used in this research was a panel data regression method with software program Eviews 9. In data regression, the chow test and hausmant test are needed to choose the most appropriate model between common effect model, fixed-effect model, and random effect model.

The model selection analysis was performed between the pooled least square (PLS) model and the fixed effect model (FEM) and then between the FEM and the random effect model (REM) that can be seen in the Chow test result and the Haussman test result. The Chow test result for 3 models showed Prob = 0,0000 for the Cross-section Chi-square, which was less than 0.05, resulting in the rejection of H0. Thus, it can be concluded that with a confidence level of 95%, the fixed effect model (FEM) was better than the common effect model (CEM). Then, the Haussman test was conducted. The test showed the average from 3 models in which Prob = 0,0187, or less than 0,05, for the random cross-section, implying that H0 is rejected. Thus, it can be concluded that with 95% confidence level, the FEM was better than the REM. The results of the Chow test and the Haussmann test showed that the FEM was more suitable than the REM to be used as the panel data regression model.

Table 2 shows the results of the regression assumption test, in which the data is normally distributed. The correlation value between the independent variables indicates that there are no indication of multicollinearity. This can be seen from the correlation between independent by variance Inflation factor (VIF) < 10. This shows that the correlation between the independent variables is not the indication of multicollinearity, autocorrelation, and heteroskedasticity and thus, the above regression model can be used in this study.

**Table 2.** Testing Assumption of Regression

Regression Assumption	Test	Test Result
Normality	JB-test :0,000 < $\alpha$ =5%	Normal, mean JB-test of variables is 54%
Multicollinearity	Variance Inflation Factor (VIF) < 10	No multicollinearity
Autocorrelation	Dwstat 1.8256 < Dwstat < 2.1744	Durbin Watson model 1 is 2.117, model 2 is 2.3469, and model 3 is 2.1545, only model 2 that is in indecision zone
Heteroskedasticity	Obs*R Squared 0,9048 > $\alpha$ -5%	No heteroskedasticity

Source: computed by the researcher from eviews.9 result

## Results and Discussions

**Table 3.** Descriptive Statistics

	OIM	ROA	ROE	STD	LTD	TD	DER	SIZE	AGE
Mean	0,153	0,043	0,101	0,150	0,431	0,588	1,561	8,69	41,00
Median	0,165	0,045	0,113	0,146	0,474	0,600	1,501	9,29	38,50
Maximum	0,319	0,099	0,223	0,241	0,614	0,849	3,403	10,50	71,00
Minimum	-0,03	-0,04	-0,06	0,091	0,187	0,310	0,448	6,06	15,00
Std. Dev.	0,078	0,031	0,062	0,036	0,115	0,114	0,661	1,39	19,66

Source: computed by the researcher from eviews.9 result

Based on the test results in Table 3, it is known that the first dependent variable (Y1), which was the Operating Income Margin as indicated by the OIM proxy, had a minimum value of -0,03 in Vietnam's "Vietnam Electricity" company that occurred in 2011 and a maximum value of 0,319 in the "First-Gen Company" Philippines that occurred in 2016. Meanwhile, the mean value was 0,153 and the standard deviation was 0,078.

The second dependent variable (Y2), Return on Assets, which was indicated by the ROA proxy, had a minimum value of -0,04 in the "PT PLN (Persero)", an Indonesian company, which occurred in 2013, and a maximum value of 0,099 in the Cambodian company "Electricide Du Cambodge", which occurred in 2010. The mean value was 0,043 and the standard deviation was 0,031.

Still in Table 3, from the third dependent variable (Y3), it is known that Return on Equity, which was indicated by ROE proxy, had a minimum value of -0,06 in the Vietnam Electricity, which occurred in 2011, and a maximum value of 0,233 in the Electricide Du Cambodge, which occurred in 2010. Meanwhile, the mean value was 0,101 and the standard deviation was 0,062.

Furthermore, based on the test results in Table 3, it is known that the first independent variable, Short Term Debt Ratio, as indicated by the STD proxy, had a minimum value of 0,091 in the PT. PLN (Persero), occurred in 2015, and the maximum value of 0,241 in the company "Electricide Du Cambodge" Cambodia, occurred in 2012. Meanwhile, the average value (mean) was 0,150 and the standard deviation was 0,036. Based on the test results in Table 3, it is known that the Long-Term Debt Ratio, as indicated by LTD proxy, had a minimum value of 0,187 in Thailand's "Electricity Generating Authority of Thailand", occurred in 2013, and a maximum value of 0,614 in Vietnam Electricity that occurred in 2011. The size of the debt ratio had an impact on the small level of profitability in the company. Meanwhile, the mean value was 0,431 and the standard deviation was 0,115.

Still, in the same table, it is known that the Total Debt Ratio, as indicated by the TD proxy, had a minimum value of 0,310 in the company PT PLN (Persero) that occurred in 2016 and a maximum value of 0,849 in the Vietnam Electricity that occurred in 2011. The magnitude of the total debt ratio had an impact on the low level of profitability in the company. Whereas, the average value (mean) was 0,588 and the standard deviation was 0,114.

Based on the test results in Table 2, it is known that the 4th independent variable, Debt to Equity Ratio, as indicated by the DER proxy had a minimum value of 0,448 in the PT PLN (Persero) that occurred in 2016, and a maximum value of 3,403 in the Vietnam Electricity that



occurred in 2011. The magnitude of the debt to equity ratio as well as LTD and TD had an impact on the low level of profitability in the company. Whereas, the mean value was 1.561 and the standard deviation was 0,661.

In the table above, the biggest value of standard deviation was shown by the control variable of AGE (company age) with 19,66 and thus, showing that fluctuations in the age variable of the company were greater than other variables. Meanwhile, the smallest value of the standard deviation was owned by the independent variable ROA (Return on Assets), which was 0,031. Thus, it can be interpreted that the age difference of each company turns out to have the same ability to generate profitability.

**Table 4.** Regression Result of Capital Structure to Profitability

	<b>Model 1 (OIM)</b> <b>Coefficient</b> <b>(P-Value)</b>	<b>Model 2 (ROA)</b> <b>Coefficient</b> <b>(P-Value)</b>	<b>Model 3 (ROE)</b> <b>Coefficient</b> <b>(P-Value)</b>
Constant	-0,7385 (0,1808)	0,3881 (0,1085)	0,3990 (0,4216)
STD	-0,4810 (0,1114)	0,0477 (0,7126)	-0,0317 (0,9064)
LTD	-0,517828* (0,0709)	-0,0285 (0,8157)	-0,2135 (0,4031)
TD	0,550886* (0,0814)	-0,0439 (0,7448)	0,0654 (0,8158)
DER	0,035986* (0,0736)	-0,0018 (0,831)	0,038131** (0,0381)
SIZE	0,0419 (0,349)	-0,0266 (0,1757)	-0,0332 (0,4122)
AGE	0,0023 (0,7228)	0,0034 (0,2403)	0,0065 (0,282)
Adjusted R <sup>2</sup>	0,804	0,764	0,742
<i>Prob (F-statistic)</i>	0,0000000	0,0000000	0,0000000

Annotation: \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%,  
Source: computed by the researcher from eviews.9 result

#### a. Short-Term Debt Ratio to Profitability

The research hypothesis was accepted in the 2nd regression model, where Short-Term Debt Ratio had a positive insignificant effect on profitability as measured by Return on Assets (ROA). Then, for the 1st and 3rd regression models, the empirical results showed different things. From the regression data, it is seen that the Short Term Debt Ratio (STD) had a negative insignificant effect on profitability as measured by Operating Income Margin (OIM) and Return on Equity (ROE).

Overall, the results of the study of this variable were following previous empirical studies conducted by Salim & Yadav (2012), Le & Pung (2013), Vätavua (2015), and Tifow & Sailir (2015). Previous empirical research is following the Pecking Order Theory, which states that companies with high levels of profitability have low debt levels because companies with high profitability have abundant internal funding sources. When internal sources of funds are

abundant, the company will use funds from the company's operating activities rather than using debt and equity. This means the company has not been able to utilize its short-term debt to increase operating profit, where operating profit is affected by operating expenses that have not been fully met by sales (revenue).

Also, the electricity company, which is a regulated industry company, is not free to increase revenue because it is influenced and limited by regulations in determining sales tariffs. Sales tariffs made by management must be approved by the government (shareholders) before they can be applied. While on the input side, companies must follow market prices such as in fuel purchases, replacement of engine parts, and the purchase of plant and equipment. Thus, when the input side cost rises, it will have a direct impact on operating costs and ultimately, it can reduce both operating profit and net profit. As a result, the possibility of operating income margin will fluctuate due to changes in the market (input side) while changes in sales prices are governed by regulations.

Then, another possibility is the cost of production is still not optimal, so it is necessary to run an efficiency program in each company's business processes so that costs can be reduced and profitability can be increased.

#### **b. Long-Term Debt Ratio to Profitability**

The results of the study of the second independent variable were in line with previous empirical findings conducted by Salim & Yadav (2012), Addae et al. (2013), Le & Phan (2013), Tailab (2014), and Tifow & Sailir (2015). Similar to the first independent variable, the results of hypothesis testing on the second variable and previous empirical research were following the pecking order theory which, prioritizes the use of internal funds to meet the company's short-term and long-term funding needs.

Long-term debt is usually used to expand company development. When the company's operational level gets higher or when the company wants to expand its operational scale, the company needs a large number of funds to fund its investment. Meanwhile, the expansion of company development requires no short time. It took almost more than 3 years to realize the development of company assets to be productive. During this waiting period, the company's financial burden, consisting of debt and interest bills, also increases but is not offset by income through the long-term debt.

#### **c. Total Debt Ratio to Profitability**

The findings in this study are following the publication of the theory of Rufus et al. (2015) and Sultan & Adam (2015) who found that there was a positive correlation between debt ratios and company profitability. In the electricity company in Southeast Asia, the increase in total debt offset by the addition of productive assets can increase operating profit and return shareholders' equity better. However, concerning the return on assets, the total debt still has not shown good results. On the other hand, the company's net income is influenced by several factors, including depreciation, financial burden, taxes, and losses on currency exchange rates.

With the use of debt from foreign currencies, it is potential for companies to be exposed to negative or loss due to the depreciation of the value of the domestic currency against foreign currencies, especially US Dollar. To reduce losses on changes in foreign exchange rates, it is necessary to implement a hedging strategy for every capital transaction through foreign currency debt.

#### **d. Debt to equity ratio on profitability**

A larger portion of the debt will be able to return shareholders' equity better and increase operating income, but will not be able to return on assets yet, because assets built through debt have not contributed more to company revenue, which is still limited by government regulations. Moreover, some items can reduce the company's net income due to the use of debt.

In addition, the negative impact of the high portion of the debt in the capital structure occurred in the Vietnam Electricity in 2011 when the company had a debt portion of 85%. Judging from the descriptive analysis of the results of the study, the company is known to get the lowest profitability seen from OIM and ROE. A similar thing happened at PLN in 2013 when an increase in debt reaching 200% had an impact on the high financial costs, which was one of the causes of 'negative' ROA in financial performance in the year.

### **Conclusion**

Capital structure is a very sensitive subject in the field of financial management because it partly affects its profitability (Tailab, 2014). Thus, the intended aim of conducting this study was to investigate the effect of capital structure, consisting of short-term debt ratio (STD), long-term debt ratio (LTD), total debt ratio (TD), debt equity ratio (DER), and firm age and size, on profitability as measured by operating income margin (OIM), return on equity (ROE), and return on assets (ROA) of electricity companies in Southeast Asia for a period of eighth years (2009-2016).

The results of this study indicate STD and LTD have a negative relationship with profitability that significant effect for LTD on OIM. Furthermore, positive and negative relationships of the capital structure by TD and DER on profitability with the empirical statistics showed that TD and DER had positive significant influence on OIM and ROE, but had negative insignificant relation with ROA. These results cannot be generalized because of a small size of sample. Electricity companies in Southeast Asia should be able to manage and service their debts. Future research is suggested to examine this study with larger sample size of firms and to address independent variables, such as interest rate and exchange rate.

### **Implication**

Increasing debt will adversely affect the company if it is not managed properly and therefore, it is advisable to implement strategies that can further increase profitability and minimize the risk that can reduce profitability caused by the addition of debt. Thus, it is necessary to optimize the capital structure by adjusting the target of capital structure that can provide a balance on the marginal cost and marginal benefit. Some alternatives are suggested as follows.

First, efficiency should be made throughout the company's business processes to reduce the cost of goods sold (CoGS) or operating expenses. Second, sales rates should be formulated by following the economic value that is relevant to the level of profit, or profitable. Third, companies in the future should carry out portfolio management (diversification) in extending debts with hedging schemes. Fourth, it is necessary to have management control over the use of debt, so that it is always used for investment decisions that can produce optimal returns, such as the development of renewable energy with minimal operational costs. By doing this research, academics will be able to add the influence of capital structure on profitability especially in electricity companies in developing countries to the literature.

The subjects in this study were limited to the companies in the electricity industry in only a few countries, so they have not fully described the electricity company in Southeast Asia in general. The research period was quite long, from 2009 to 2016, but only one data was taken annually. Moreover, companies that were sampled were limited to one company in one country. The independent variable and the chosen control variable were fundamental from the internal company and did not include other external factors that may affect profitability such as macroeconomic factors (inflation, interest rates, exchange rates, and economic growth).

Some recommendations for future research are as follows. For the generalization of research results, it is recommended to take a growing number of samples of companies and companies that are believed to be able to represent the population in the electricity industry in Southeast Asia. It is still possible to create a regression model with a higher coefficient of determination by adding independent variables and other control variables, especially external factors such as taxes, inflation, interest rates, and exchange rates.

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