Interactions between Capital Structure and Profitability: Evidence from Indonesia Stock Exchange

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ABSTRACT

The objective of the study is to reexamine the relationship between capital structure and profitability of companies in Indonesia. The study was conducted because of the ambiguity of the relationship between two variables that many researchers have done before. Ambiguity in question is the inconsistency of the relationship, which is what the variable as independent and other variable are as dependent. Sample data of all non-financial companies are listed on the Indonesian Stock Exchange (IDX). Analysis has been done using the Granger causality, which is to determine the direction of the relationship between capital structure and profitability. The results showed that the relationship between capital structure and profitability is unidirectional, namely variable of capital structure as an endogenous variable, and profitability as an exogenous variable using the lag level of two, thus from profitability to capital structure.

JEL Classifications: C22; D24; G20.

Keywords: Capital Structure; Profitability; Causality.

1.   INTRODUCTION

In one business cycle, from funding to income, retained earnings become an additional fund for the next cycle. When the company is already running, funding decision and profit sharing are connected with each other, it can no longer be distinguished which one is the beginning and the end. Both are interrelated. The existence of the company begins with equity. But, equity resources are limited, especially to meet the rising demand. So the equity shortcomings can be fulfilled by debt. The company takes the option to use debt because the gains are expected to be greater than not using debt. The benefit of using debt is the profit that the company will get and is bigger than the cost of debt, and the use of debt leads to tax saving that reduce the cost of the company (Rose & Hudgins, 2008). Ultimately, this will have an impact on profit growth. In the combination of certain proportions of debt and equity, the optimum profit is expected to be obtained. This is described by optimum capital structure theory (Rose & Hudgins, 2008). This study aims to explain capital structure affect on the profitability of the companies.

For the company which has been operating in a long time period and has generated profit, then this profit can be the source of funding to support operations further to increase profits through increased sales. The selection of these funding sources will form the new capital structure. This strategy is supported by *'Pecking Order Theory'*. Profitability is the ability of the company to make a profit for a specific period. Profit is the shareholder's rights. If distributed as a dividend, and if it use to increase the capital of the company into retained earnings [Sartono (2008:122); Riyanto (2008, 35)]; Brigham and Houston (2001:89)]. According to many researches, the optimum capital structure theory and the pecking order theory have varied results. This means that both of capital structure theory are found valid. Though the concept of these two theories is used to explain the relationship of capital structure with opposing profitability related variables in determining the causes and effects. So it may not apply at the same time on the same subject.

Capital Structure Theory trade-off model assumes that the company's capital structure is the result of a trade-off of a tax advantage by using debt at a cost that would result from the use of such debt (Rose & Hudgins, 2008). The essence of the trade-off theory of capital structure balances the benefits and sacrifices that arise as a result of the use of debt. As far as benefits are still greater, additional debt is still allowed. If the sacrifice for the use of debt is greater, then the additional debt is not allowed. The trade-off theory has been considering various factors such as

corporate tax, bankruptcy cost, and personal tax in explaining why a company chose a certain capital structure (Husnan & Pudjiastuti, 2002). However, the trade-off theory theory can not determine the exact proportions of an optimal capital structure, but it provides a significant contribution (Horne & Wachowicz, 2008; Rose & Hudgins, 2008). If the composition of capital is optimal, the company's profits will also be optimal. But in fact, many large and succesful companies, such as Intel and Microsoft, didn't use as much debt as the recommended theory of trade-off. This led to more development of theories of capital structure (Weston & Copeland, 1992; Horne & Wachowicz, 2008; Brigham and Houston, 2001). In the relevant literature, studies find that the capital structure affect the profitability significantly. Some studies find negative effects while some other find positive effects. According to literature studies, profitability has also significant effects on capital structure. Again this evidence is also mixed of findings since some studies find negative effects while some other find positive effects.

Based on the results of the theory and relevant research, there is a theoretical structure that is different between the theory of optimum capital structure and the pecking order theory. The purpose of this study is then to examine how the relationship between capital structure and profitability is; whether it is unidirectional or bidirectional. If one-way, then, what is the dependent variable and what is the independent variable. The companies that are listed in Indonesian stock exchange (IDX) are assumed to be profitable ones for two consecutive years as selected this study as a sample. The next section will describe methodology in brief.

2. METHOD

Companies in this study are all non-financial companies listed on the Stock Exchange of Indonesia during 2012-2013 (annual data). Variables of the study are the capital structure (with ratio of long-term debt to equity capital (Rose & Hudgins, 2008)) and profitability with ROE (return on equity) proxy (Rose & Hudgins, 2008; Sartono, 2001: 124). Based on the theory, relevant researches, and the research framework in this study, the following structural models are then proposed for Granger causality, namely (Equations 1 and 2):

1.   **Model 1: Dependent variable: Capital structure**

$$CS_i = \beta_0 + \beta_1 \left(PR_i \right) + \varepsilon_i \tag{1}$$

2.   **Model 1: Dependent variable: Profitability**

$$PR_i = \beta_0 + \beta_1 \left(CS_i \right) + \varepsilon_i \tag{2}$$

where:
β_0	: Constant intercept
β_1	: Regression coefficient
CS_i	: Capital Structure (debt / equity)
PR_i	: Profitability (ROE = net income / shareholder's equity)
e_i	: *Error term*

There are steps in estimating the above proposed models as required by econometric analysis. The first test is optimum lag selection with Akaike Information Criteria (AIC). Secondly, Granger causality test will be employed to determine the actual direction of the relationship between capital structure and profitability. Thirdly, test for Heteroskedasticity will be carried out since data is cross-sectional. In order to estimate equations (1) and (2), it is assumed and made sure that data generating process of CS and PR variables are stationary (Heidari et al., 2012a; 2012b; Fethi et al., 2013; De Vita et al., 2015).

3. ANALYSIS AND DISCUSSION

Descriptive statistics of two stationary series, capital structure and profitability are presented in Table 1. Series of this study (CS and PR) are stationary ones as a result of unit root tests. As can be seen from the table, a total of 341 observations will be available in the analysis of this study.

From skewness statistics in Table 1, it is seen that capital structure curve is skewed to the right while profitability curve is skewed to the left. Since mean and median are not equal and standard deviations are greater than means, both capital structure and profitability curves are not normally distributed (Lind et al., 2014).

Table 1. Descriptive Statistics

	CS	PR
Mean	2.159280	0.075643
Median	0.990000	0.104850
Maximum	37.99500	1.165700
Minimum	-3.695000	-3.854200
Std. Dev.	3.544550	0.364010
Skewness	4.276656	-5.931389
Kurtosis	34.74787	56.78676
Sum	736.3145	25.79430
Observations	341	341

In the next step, based on AIC criteria and as can be seen from Table 2, the optimal lag order lies in the lag of two for both capital structure and profitability variables to be used in Granger causality tests. It is important to mention that a total of eight (Panel A), five (Panel B), and ten (Panel C) lags have been selected for comparison purposes all of which gave the same result of lag level = 2.

Table 2. AIC Criteria for Optimum Lag Level

A.   Lag Order 8 with AIC

VAR Lag Order Selection Criteria
Endogenous variabel: ROE

Lag	LogL	LR	FPE	**AIC**	SC	HQ
0	-930.2117	NA	1.430435	6.033733	6.057897*	6.043394*
1	-924.1763	11.95356*	1.411716	6.020559	6.093051	6.049541
2	**-919.9350**	**8.345403**	**1.409519***	**6.018997***	**6.139817**	**6.067301**
3	-918.7748	2.267783	1.435681	6.037378	6.206526	6.105003
4	-917.6574	2.169728	1.462744	6.056035	6.273511	6.142983
5	-915.9022	3.385467	1.484192	6.070565	6.336369	6.176834
6	-914.6407	2.416887	1.510793	6.088289	6.402422	6.213880
7	-913.3857	2.388076	1.537957	6.106057	6.468517	6.250969
8	-911.9826	2.651910	1.564135	6.122865	6.533653	6.287099

B.   Lag Order 5 with AIC

Lag	LogL	LR	FPE	**AIC**	SC	HQ
0	-957.5302	NA	1.353410	5.978381	6.001879*	5.987763*
1	-951.1233	12.69403*	1.333266	5.963385	6.033879	5.991531
2	**-947.0165**	**8.085546**	**1.332385***	**5.962720***	**6.080210**	**6.009631**
3	-945.7101	2.555814	1.354947	5.979502	6.143989	6.045178
4	-944.4618	2.426579	1.378398	5.996647	6.208130	6.081087
5	-942.8792	3.056855	1.399350	6.011708	6.270187	6.114913

Table 2. AIC Criteria for Optimum Lag Level (Continued)

C.   Lag Order 10 with AIC

Lag	LogL	LR	FPE	**AIC**	SC	HQ
0	-893.7258	NA	1.317732	5.951666	5.976298*	5.961523*
1	-887.6984	11.93452	1.300102	5.938196	6.012091	5.967765
2	**-882.8189**	**9.597017**	**1.292532***	**5.932351***	**6.055511**	**5.981634**
3	-881.4992	2.577950	1.315772	5.950161	6.122585	6.019157
4	-880.4663	2.004049	1.341995	5.969876	6.191563	6.058586
5	-878.5994	3.597376	1.361191	5.984049	6.255001	6.092472
6	-877.1036	2.862438	1.384088	6.000688	6.320904	6.128824
7	-875.9211	2.247061	1.410325	6.019409	6.388889	6.167259
8	-874.4652	2.747315	1.434477	6.036314	6.455057	6.203877
9	-873.4330	1.934193	1.463184	6.056033	6.524040	6.243309
10	-866.6240	12.66789*	1.436297	6.037369	6.554640	6.244358

 * indicates lag order selected by the criterion

In the next step, Granger Causality Test is used to determine whether the research model has a relationship toward one direction or both directions. Granger Causality Test results are presented in Table 3:

Table 3. Results of Granger Causality Test

Pairwise Granger Causality Tests
Lags: 2

Null Hypothesis:	Obs	F-stat.	Prob.
PR does not Granger Cause CS	333	2.86944	0.0582
CS does not Granger Cause PR		0.15723	0.8546

In Table 3, it is seen that for the hypothesis where PR does not Granger cause CS can only be rejected since F-statistic (2.86944) is statistically significant at alpha = 0.10 level (prob. < 0.10). However, the second hypothesis where CS does not Granger cause PR cannot be rejected since F-statistic (0.15723) is not statistically significant (Prob. > 0.10). Thus, it is concluded that there is unidirectional (one direction) causality that runs from profitability to capital structure in the case of listed companies in the Indonesian Stock Exchange. So, we conclude that any changes in profitability levels of companies will preceede further changes in their capital structure and debt and equity performances.

In the next step, regression model based on equation (1) is estimated to see if profitability also exerts significant effects on capital structure. Results are provided below:

$CS_t = 2.536141 - 4.910720\ PR_t + 0.353329\ PR_{t-1} - 0.533231\ PR_{t-2}$
*T stat.   10.68 ***   0.77   1.16*
$\chi^2 = 1.116\ (p > 0.10)$
*** = significant at 0.01*

It is important to mention that since optimum lag was obtained at lag = 2, this regression model above has been estimated with lag = 2 level. It is seen that profitability does not exert statistically significant effects on capital structure at lags one and two but it exerts negatively significant effect at its level is its coefficient is statistically significant at alpha 0.01 level ($\beta = -4.910720$, $p < 0.01$). It is then concluded that profitability in the listed companies of Indonesian Stock Exchange exerts negative effects on the level of capital structure or debt to equity ratio. Thus, this result was expected that an increase in profitability would reduce debt level. Finally, chi-square test statistic ($\chi^2 = 1.116$) for White Heteroskedasticity is not statistically significant; thus, the null hypothesis of homoskedasticity of variances is accepted and this is to conclude that results are free of heteroskedasticity problem.

4. CONCLUSION

This study aimed at investigating empirical relationship between capital structure and profitability in the case of all listed companies in the Indonesian Stock Exchange during 2012-2013 using a cross sectional annual data. Results of regression analysis showed that profitability in the non-financial firms exerts negatively significant effect on the level of debt to equity ratio (capital structure). This reveals that an increase in profitability would lead to significant decreases in the level of debt in the non-financial firms. On the other hand, according to Granger causality tests, this study found that unidirectional causality exists that runs from profitability to capital structure (debt to equity ratio). Thus, this finding is in parallel with regression results of this study.

The nature of the relationship between profitability and Capital Structure in this study can be explained by the Pecking Order theory. This theory explains that companies, including companies listed in the Indonesia Stock Exchange, target to meet the capital on a priority basis. The first and main source of funding comes from internal sources, ie Retained Earnings, if not, they go to use external sources of debt and equity with the order. Thus, results of this study are in parallel with the Pecking Order Theory. Finally, this study proposes further researches by using alternative proxies of capital structure and profitability and by using different data period for comparison and robustness purposes.

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