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Cost of Capital as a Benchmark of Capital Structure Optimization

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Abstract: The purpose of the present study was to prove that the WACC can be used as a benchmark of capital structure optimization. Population was IDX-listed manufacturing companies from 2009-2013. Sampling using a purposive sampling method. Secondary data were used with a quantitative approach. Hypotheses were tested by using a multiple regression analysis. Analysis showed that the DAR, LDER and the NPM simultaneously had significant effects on the cost of capital. Partial analysis showed that the DAR had an effect on the cost of capital. The LDER and NPM partially had no effect on the cost of capital. Comparison of means showed that ROI was lower than the means of the WACC. Thus, it can be concluded that the WACC can be used as a benchmark of capital structure optimization with the WACC as the minimum ROI.

Key words: DAR, LDER, NPM, WACC, ROI

INTRODUCTION

A capital structure is a combined funding of investment originated from equity capital or loan capital. Both components of the capital structure can give rise to cost of capital. The Weighted Average Cost of Capital (WACC) can be calculated on the basis of the cost of capital which will then be used as an indication of the minimum rate of Return On Investment (ROI) that has been made by the company. In order to obtain an indication of the capital structure optimization, the WACC should be compared to the ROI (earning power). Brigham and Houston (2011) suggests that the concept of cost of capital is the optimum capital structure, a capital structure that can minimize the average cost of capital. The amount of the cost of capital depends on the proportion of each source of capital as well as the cost of each component of the source of capital.

Debt to total Assets Ratio (DAR) is a ratio used as a parameter for measuring the DAR of the company. The DAR is obtained from the company's total debt divided by total assets. This ratio can indicate the amount of the debt used for the funding of investment in the form of current assets, fixed assets and other assets. According to Gitman (2000), this ratio emphasizes the importance of debt financing for a company by showing the percentage of the company's assets supported by debt financing. The greater the DAR the greater the company's dependence on external parties and the greater the cost of capital borne by the company will be. The increasing ratio of debt to total assets has an impact on the company's profitability since some of it is used to pay the interest on the loan. Conversely, the lower the DAR, the smaller the cost of capital borne by the company will be. Thus, debt to total asset may affect the rate of cost of capital.

Long-term Debt to Equity Ratio (LDER) is the ratio of long-term debt to equity capital. This ratio is also used to measure the extent to which the long-term debt is collateralized by equity capital (Brigham and Houston, 2011). The purpose is to measure how much of every dollar of equity capital is collateralized for long-term debt by comparing the long-term debt with the equity capital provided by the company. An increasing LDER indicates a greater composition of long-term debt than equity capital. This leads to lower equity capital collateral than long-term debt and at the same time will affect the capital structure which will ultimately have an impact on the cost of capital.

Net Profit Margin (NPM) is the ratio that indicates the percentage of net profit earned from each sale (Brigham and Houston, 2011). This ratio shows the level of efficiency of the company or the extent to which the company is able to reduce its operating costs in certain periods. The greater the ratio the better the company's ability to earn profits will be. Conversely, the lower the ratio the worse the company's ability to earn profits from sales will be. When the NPM increases, the retained earnings will also increase. Thus, the components of the capital structure of share capital (dividends borne by the company) will also change according to the increase in

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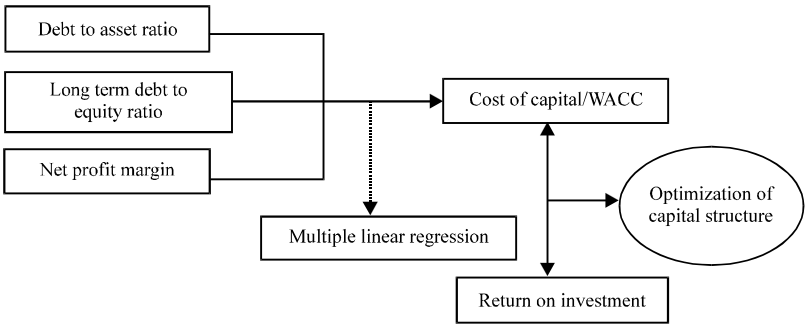

Fig. 1: Conceptual framework

the total equity. Previous studies have rarely investigated the DAR, LDER and NPM associated with the cost of capital with regard to capital structure optimization. Hence, the researcher was interested to conduct a further study of capital structure optimization by using the cost of capital as a benchmark.

Capital structure: Capital structure constitutes one of the complicated financial decisions as it relates to other variables of financial decision making. A poor decision of capital structure can lead to high cost of capital; thus, an effective financial decision can lower the cost of capital. The most important criteria in selecting the components of funding source are the lowest risk and a high rate of return. With regard to the concept of cost of capital, an optimum capital structure is the one that minimizes the WACC Wild *et al* . (2007) makes it clear that managers should consider the benefits and costs of the funding sources selected in making funding decisions. Each of these funding sources has different financial consequences and characteristics. A company's internal funding sources derive from retained earnings and depreciation. External funding sources can be divided into debt financing and external equity. A mixed use of equity capital (both common stock and preferred stock) and debts to meet the financing needs of the company is the capital structure of the company. In a similar vein, Brealey *et al*. (2007) states that capital structure is a mix of long-term debt financing and equity financing.

Determining a capital structure policy must involve the risk and rate of return since addition of debts will increase the company's risk and at the same time increase the expected rate of return. As such an optimal capital structure is required which optimizes the balance of the risk and the rate of return (Dewi, 2010). The capital structure chosen to address the issue of how much capital requirements used by the company is the one that maximizes the value of the company. Weston and Copeland (1996) argue that an optimal capital structure is the one which optimizes the balance of risk and return. An optimal capital structure is often referred to the company's targeted capital structure since the company's value is maximized and the company's cost of capital tends to be minimized. Determination of the targeted capital structure relates to the company's financial leverage (Erkaningrum, 2008).

Concept of cost of capital: The concept of "cost of capital" is a highly important concept in company spending. This concept is aimed at determining the amount of costs that must actually be borne by the company to obtain funds (Brigham and Houston, 2011). Cost of capital in managerial perspective is the rate of exchange to make a decision. Cost of capital is the costs that are taken into account due to the use of a certain capital, whether it is incurred to obtain such capital or to be taken into account during the use of the capital in question. A company's cost of capital depends on the expected return of all securities issued by the company. (Sylvia, 2012) (Fig. 1).

In conclusion, a capital structure is considered as optimum when the ROI is higher than the WACC. Conversely, a capital structure is considered as not optimum when the ROI is lower than the WACC. Currently, many IDX-listed manufacturing companies with a sizeable capital structure consisting of equity financing and debts have suffered substantial losses, causing equity deficit. In addition, many companies involve considerable investments but provide a very small amount of profits. Based on the theoretical basis and reasonable thinking, several hypotheses were formulated:

- H_1: DAR, LDER and NPM have effects on cost of capital/WACC
- H_2: the lower WACC than the average ROI serves as a benchmark of capital structure optimization

Relationship among four or more variables could be determined by using the multiple regression analysis.

MATERIALS AND METHODS

The study population was IDX-listed manufacturing companies from 2009-2013. Samples were taken by using a purposive sampling method. Inclusion criterion was the company that has published their financial statements over 5 years (2009-2013). Seven food and beverage companies were included.

Cost of capital: Cost of capital is the actual cost borne by the company which is the overall cost for all sources of financing used. Cost of capital is measured by (Weston and Brigham, 1990):

- DAR or the ratio of the book value of the entire debt to total assets
- LDER, the ratio of the long-term debt to equity capital used by the company
- NPM, one of ratios used to measure profitability. This ratio measures how much net operating profit to be gained from every dollar of sales. The higher the NPM, the better a company's operation will be

Analytical technique and hypothesis examination: Analytical technique in this study uses multiple regression analysis. Before to analysis, prior to examine normality of the data. If the data is normal, then examine classical assumption (i.e., multicollinearity, heteroscedasticity and autocorrelation). If the data has normal and it has independent from classical assumptions, perform analysis and hypothesis examination. F-test which is a test of the fit of the regression analysis model, was used to determine whether the independent variables which were the balance of DAR, LDER and NPM had simultaneous effects on cost of capital. The t-test was to examine the significance of the effects of DAR, LDER and NPM on cost of capital partially. This test was to determine the individual effect of the independent variables on the dependent variables in the IDX-listed manufacturing companies

RESULTS AND DISCUSSION

The data normality test is examining both independent and dependence variables in the regression model, whether they are normally distributed or not. Examination was conducted using Kolmogorov-Smirnov method. Basic analysis is used, if either significance or probability value (Asymp. Sig. (2-tailed)) is larger than 5% means normal distribution. Table 1 shows all of the study data were normally distributed. It is visible from either significance or value Asymp. Sig. (2-tailed) produced 0.667 is larger than 5%.

Classical assumption examination: Multicolliniarity examines whether in the regression model is found correlation among independent variables. A good regression model should not occured among independent variables (Gujarati, 2005). Experimental instrument that used to determine whether there are multicolliniarity in this regression model is used by looking at how large the Variance Inflation Factor (VIF) <10 value and tolerance value >0.1. From Table 5 can be known that the VIF at three independent variables <10 and tolerance value >0.1. Thus, it can be concluded that three independent variables in the study is not multicollinierity.

Heteroscedasticity examines whether in the regression model occurred inequality residual variance from one observation to another observation. If the residual variance from one observations to another observations are remained, then it can be called homoscedasticity. If they are different, they called heteroscedasticity (Gujarati, 2005). Heteroscedasticity examination is performed by using Spearman Rank. Table 2 shows all of the independent variables value >0.05. As a result, the independent variable in this study can not be heteroscedasticity. Autocorrelation, examines whether there is a confounding corelation in the regression model at t period with an error at t-1 period (previously). In order to examine whether there is an autocorrelation or not, it can be used the Durbin Watson examination. An observation data, it said that it has not an autocorrelation if the value of du <d <4-du (Gujarati, 2005). From autocorrelation examination results obtain durbin watson value that produced from the regression model. Table 3 shows that the durbin watson value is 1.795 and it is located between dl = 1.244 and du = 1.650. It can be seen from the durbin watson with the number of sample n = 35 and k = 3, that k is the number of independent variable. Therefore, du<d<4-du value is 1.650<1.795<(4-1650). It can be concluded that there is no autocorrelation in the regression model, both positive and negative.

Analysis and hypothesis examination: Table 5 the results of multiple regression analysis. It proves that the DAR, LDER and NPM have impact to the Cost of Capital (WACC). The multiple regression equation that produced are:

$$Y = 3.297-3.725X1+1.137X2+5.607X3$$

The ($\beta 0$) positive value indicates that DAR, LDER and NPM variables are constant, then the large number of WACC value is about 3.297 units. The ($\beta 1$) negative value indicates that there is an opposite directional relationship between the WACC and DAR. If the DAR increases

Table 1: Result of data normality test one-sample kolmogorov-smirnov test

Tests	X1_DAR	X2_LDER	X3_NPM	Y_WACC	Unstandardized residual
N	35.00000	35.00000	35.00000	35.00000	35.00000000
Normal parameters[a, b]					
Mean	0.49820	0.29210	0.05770	2.34500	0.00000000
SD	0.14179	0.31029	0.05118	0.95948	0.72747338
Most extreme differences					
Absolute	0.15600	0.18200	0.22400	0.10900	0.12900000
Kolmogorov-Smirnov Z	0.15600	0.17400	0.22400	0.10900	0.12900000
Asymp. Sig. (2-tailed)	-0.12900	-0.18200	-0.15500	-0.08400	-0.06100000
Positive	0.88400	1.02700	1.26500	0.61500	0.72800000
Negative	0.41500	0.24200	0.08200	0.84300	0.66700000

[a]Test distribution is Normal.**[b]Calculated from data

Table 2: Result of heteroscedasticity test (correlations)

Spearman's rho	X1_DAR	X2_LDER	X3_NPM	Y_WACC	Unstandardized residual
X1_DAR					
Correlation coefficient	1.000	0.680**	-0.693**	-0.560**	0.029
Sig. (2-tailed)	.	0.000	0.000	0.001	0.875
N	35.00	35.000	35.000	35.000	35.000
X2_LDER					
Correlation coefficient	0.680**	1.000	-0.324	-0.245	0.078
Sig. (2-tailed)	0.000	.	0.071	0.176	0.671
N	35.000	35.000	35.000	35.000	35.000
X3_NPM					
Correlation coefficient	-0.693**	-0.324	1.000	0.623**	0.105
Sig. (2-tailed)	0.000	0.071	.	0.000	0.567
N	35.000	35.000	35.000	35.000	35.000
Y_WACC					
Correlation coefficient	-0.560**	-0.245	0.623**	1.000	0.760**
Sig. (2-tailed)	0.001	0.176	0.000	.	0.000
N	35.000	35.000	35.000	35.000	35.000
Unstandardized residual					
Correlation coefficient	0.029	0.078	0.105	.760**	1.000
Sig. (2-tailed)	0.875	0.671	0.567	.000	.
N	35.000	35.000	35.000	35.000	35.000

**Correlation is significant at the 0.01 level (2-tailed)

Table 3: Result of Autocorrelation test (model summary[b])

R	R^2	Adjusted R^2	SE	Durbin-Watson
0.652[a]	0.425	0.364	0.76545	1.795

[a]Predictors: Constant, X3_NPM, X2_LDER, X1_DAR; [b]Dependent variable: Y_WACC

Table 4: Results of simultaneous analysis (F-test) (ANOVA[b])

Variables	Sum of Squares	df	Mean Square	F	Sig.
Regression	12.133	3	4.044	7.937	0.007[a]
Residual	16.406	31	0.587		
Total	28.539	34			

[a]Predictors: Constant, X3_NPM, X2_LDER, X1_DAR; [b]Dependent Variable: Y_WACC

about one unit, then the large number of WACC value will decrease about-3.725 unit, it was assumed that the other independent variables were constant. The (β2) positive value indicates that there is same directional relationship between the WACC with LDER. If the LDER value increases about one unit, then the large number of WACC value will increase about 1.137 units, it was assumed that the other independent variables were constant. The (β3) positive value indicates that there is same directional relationship between the WACC with NPM. If the NPM value increases about one unit, then the large number of WACC value will increase about 5.607 unit, it was assumed that the other independent variables were constant. Results of simultaneous analysis (F-test) on Table 4, showed F-test of 7.937 with a significance of 0.007. This implied that the three independent variables simultaneously had significant effects on the WACC. Thus, WACC could be used as a benchmark of capital structure optimization with the WACC as a minimum rate of ROI. Results of partial analysis (t-test) on Table 5, showed results of partial hypothesis testing (t-test) showed that DAR had a significance of 0.049<0.05, meaning that DAR had a significant effect on WACC. It could be concluded the higher the ratio the higher the risk will be. Obviously, this ratio raised the cost of capital in the funding activity for the continuity of the company. Results of partial hypothesis testing for LDER by the use of t-test showed a significance of 0.779>0.05, meaning that LDER had no effect on WACC. The LDER in the capital structure of the food and beverage companies sampled in the study for 2009-2013 was 29%, on average. The equity capital in the capital structure was larger (78%). This ratio showed that the majority of the sampled companies had low long-term debts (22%). The cost of capital in the Table 5: capital structure for the LDER was also low,

Table 5: The Results of multiple regression analysis (Coefficients[a])

Variables	Unstandardized coefficients (B)	SE	Standardized coefficients (β)	t-values	Sig.	Collinearity statistics	
						Tolerance	VIF
Constant	3.297	0.732	4.495	0.000	-	-	-
X1_DAR	-3.725	1.315	-0.403	-2.072	0.049	0.044	1.839
X2_LDER	1.137	0.517	0.033	0.198	0.779	0734.000	1.363
X3_NPM	5.607	3.232	0.352	2.044	0.057	0.691	1.448

[a]Dependent variable: Y_WACC

following the LDER level. This was because in the period of sampling most of the sampled companies had already paid their long-term debts Results of partial hypothesis testing (t-test) showed that net profit margin had a significance of 0.057>0.05, indicating that NPM had no effect on WACC. This was because, on average, the companies sampled in 2009-2013 had low rate of profits (0.06 or 6%). This led to a small growth of retained earnings, thus, the cost of capital itself became small.

In overall, the companies showed a lower ROI than their WACC. This demonstrated that capital structure of the seven companies sampled in this study was not optimal since the profits generated by those companies over a period of 5 years were quite small, leading to a minimum ROI. The small amount of profits were caused by the suboptimal profit-generating performance of the company. Theoretically, an optimal capital structure is the one that can minimize the average cost of capital usage and should be kept below the rate of ROI. In order to achieve an optimal capital structure, companies should take into account the costs arising from the fulfillment of capital. In addition, it should be offset by an increase in the company's performance in meeting the company's objective of achieving an increase in earnings without being disturbed by the obligation to fulfill the cost of capital. It is evident that cost of capital can be used as a benchmark of capital structure optimization by comparing ROI and WACC in accordance with the theories described and substantiated in this study.

CONCLUSION

The variables DAR, LDER and NPM simultaneously contributed significantly to cost of capital. DAR contributed partially to cost of capital. LDER and NPM had no affect on cost of capital. Cost of capital can be used as a benchmark of capital structure optimization by comparing the average ROI with WACC of the IDX-listed manufacturing companies.

REFERENCES

Brealey, R.A., S.C. Myers and A.J. Marcus, 2007. Fundamentals of Corporate Finance. The McGraw Hill, New York, USA.

Brigham, E.F. and J.F. Houston, 2011. Fundamentals of Financial Management. 11th Edn., The McGraw Hill, New York, USA.

Dewi, E., 2010. The influence of capital structure to profit optimization (Case studies on companies who go public in the list jakarta islamic index period 2001-2005). Indonesian J. Accounting Res., 4: 01-08.

Erkaningrum, I., 2008. The determinants of the capital structure. J. Accounting Bus. Anal., 1: 164-174.

Gitman, J.L., 2000. Principles of Managerial Finance. 9th Edn., Addison Wesley Longman, Boston, Massachusetts.

Gujarati, D.N., 2005. Basic econometrics. Ref. Publish, Istanbul, 33: 540-578.

Sylvia, S., 2012. The relationship between the cost of equity capital with the level of social responsibility disclosure and intellectual capital in the banking sector in Indonesia. J. Accounting Auditing, 9: 71-74.

Weston, J.F. and E.F. Brigham, 1990. Essentials of Managerial Finance. 12th Edn., Cengage Learning, Boston, Massachusetts, ISBN: 9780030258732, Pages: 390.

Weston, J.F. and T.E. Copeland, 1996. Financial Theory and Corporate Policy. 8th Edn., The Dryden Press CBS Publishing, Tokyo, Japan,.

Wild, J.J., K.R. Subramanyam and F.H. Robert, 2007. Financial Statement Analysis. 9th Edn., McGraw Hill, New York, USA.