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The Determination of Capital Structure in Indonesian Stock Exchange: an Analysis from Basic and Chemical Industry

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Abstract

The purpose of this research are to test and analyze empirically the influence of profitability, liquidity, firm size, business risk, growth opportunities, asset structure and tax shield toward capital structure. This research was also to improve the previous research. Sector basic industry and chemical can the effect capital structure if the higher of debt ratio than the higher risk on the company. Trade- off is between Risk and Return that became most important on the company make a decision. In this case that relationship with effect profitability, liquidity, firm size, business risk, growth opportunities, asset structure and tax shield to debt ratio that relationship with Trade off theory and Pecking Order Theory. Sample used in this research is manufacture companies, sector basic industry and chemical listed in Indonesia Stock Exchange over the 8 years period 2007-2014. The purposive sampling is used as sampling technique to obtain 17 companies met the criteria and were analyzed using descriptive statistics and multiple regression with random effect model for panel data were performed to test the hypotheses. The empirical evidence from this study shows that profitability and liquidity influence capital structure, while firm size, business risk, growth opportunities, asset structure and tax shield do not influence to capital structure. In addition, overall the independent variables influence capital structure simultaneously.

Keywords: Profitability, liquidity, firm size, business risk, growth opportunities, asset structure, tax shield, capital structure

1. INTRODUCTION

Capital has contributed to improving the company's productivity and facilitate the company to expand its business. Capital so critical to business success. The capital structure is a balance between the use of loan capital consisting of: short-term debt that is permanent, long-term debt with its own capital comprising: preferred stock and common stock (Sjahrial 2009, 179).

The capital structure can be calculated with a debt ratio (DR). Debt ratio shows the proportion of debt to assets. Capital structure determines the cost of the weighted average cost of capital (WACC). WACC is the minimum level required return on investment of a company, which is used to make investment decisions (Pattweekongka and Napompech 2014).

Companies can increase the value of the company if the income is higher than the investment costs. Therefore, the company should be able to optimize its financing structure well, so that a higher income than the cost of investment in order to enhance shareholder value.

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Increased sales at the company indicates that the company is growing. The higher level of sales growth of the company, the more capital is needed, both from internal and external funds. When viewed from the average sales growth of the manufacturing industry, the growth of the chemical industry are more basic and often have a high sales increase compared to a variety of industrial and consumer goods industry. Seen from a higher average sales growth from 2009 through 2014.

Table 1. Growth rate sales manufacturing industry

Manufacturing Industry	2009 -2014
Basic Industry & Chemicals	66,479
Various Industry	40,338
Consumer Goods Industry	46,265

Source: IDX

2.   LITERATURE REVIEW AND HYPOTHESES
2.1   Capital Structure

The capital structure is a balance between the use of loan capital consisting of: short-term debt that is permanent, long-term debt with its own capital comprising: preferred stock and common stock (Sjahrial 2009, 179). Research on capital structures that are dominated by two basic theories that the Trade-Off Theory and Pecking Order Theory (Joni and Lina 2010.84). Trade-Off theory states a company can determine the target debt ratio (Debt Ratio) is optimal. Optimal debt ratio is determined by consideration of the benefits and costs of bankruptcy because the company has a debt (Joni and Lina, 2010).

2.2   Profitability

Profitability is the company's ability to earn a profit through all of the capabilities and available resources such as sales activities, cash, capital, number of employees, number of branches, and so forth (Harahap 2011, 304). According to the pecking order theory, firms with a higher profit will use internal funds for utility companies, after the debt, then issue shares.
Ha1: There is the influence of profitability on the capital structure.

2.3   Liquidity

Liquidity by Gitman and Zutter (2012, 71) is "a firm's ability to satisfy its short-term obligations as they come due." According to the pecking order theory, internal cash resources not only of profitability, but also liquidity. Research conducted by Alkhatib (2012) states that the positive effect of liquidity on the capital structure. Meanwhile, according to research Pattweekongka and Napompech (2014) liquidity adversely affect the capital structure. However Seftianne research and Hand (2011) did not affect the liquidity of Capital Structure.
Ha2: There is the effect of liquidity on the capital structure.

2.4   Firm Size

Company size is the size or magnitude of the assets owned by the company, which in the proxy with the logarithm of total assets (Wake up and Surianty 2008) in Firnanti (2011). The larger the size of a company, the more funds are required by the company. the bigger a company, the company will increasingly use the debt. In a study conducted by the Women (2012) firm size has a positive effect on the capital structure. According to Mishra (2011) firm size adversely affect the capital structure. However, in a study conducted by Pattweekongka and Napompech (2014) states that the firm size has no effect on capital structure.
Ha3: There is the influence of firm size on the capital structure.

2.5   Business Risk

Business risk is the uncertainty in projections of the company on the rate of return or profit in the future (Haryanto, 2012). Companies that are not able to meet its obligations is affected by the business risk and financial risk of the company. Debt increases risk in the company's business and could bankrupt the company. So that companies with substantial business risks indicate that the company is much debt.

Research conducted by Pattweekongka and Napompech (2014) states that the business risk has a positive influence on the capital structure. According Yunaningsih (2002) business risk adversely affect the capital structure.

However, in a study conducted by Haryanto (2012) states that the business risk has no effect on the capital structure.

Ha4: influences of the business risk to the capital structure.

2.6   Growth Opportunities

Growth Opportunities (sales rate) is the sales growth from year to year can be measured by comparing the sales in year t after deducting sales in prior periods to sales in the previous period (Marpaung, 2010). Companies that have high growth rates will require more capital. Research conducted by Haryanto (2012) growth opportunities positive effect on the capital structure. Research conducted by Pattweekongka and Napompech (2014) states that the growth opportunities have no effect on the capital structure of a company.

Ha5: influences of the growth opportunities of the capital structure.

2.7   Asset Structure

According to Women (2012) asset structure is the ratio between fixed assets to total assets. Companies that have a fixed asset that is more likely to use more debt for tangible assets can be pledged as collateral by the company to external parties. Research conducted by Pattweekongka and Napompech (2014) asset structure positive effect on capital structure. in research Gill and Mathur (2011) asset structure adversely affect the capital structure. However, based on research Seftianne and Hand (2011) asset structure did not affect the capital structure.

Ha6: influences of the asset structure of the capital structure.

2.8   Tax Shield

According to Richardson and Lanis (2007) in Hanum (2013), the effective tax rate (tax shield) is the ratio between real tax we pay with commercial profit before tax. With debt, the company's revenue will decrease due to the payment of interest due to the debt that will reduce taxes. The greater the debt, the less tax to be paid by the company. Research conducted by Afza and Hussain (2011) states that the tax shield positive effect. Research conducted by Mishra (2011) that the tax shield has a negative influence on the capital structure. However, in a study conducted by Pattweekongka and Napompech (2014) tax shield has no effect on the capital structure.

Ha7: There is a tax shield effect on the capital structure.

Here the framework of this study, which describes how the logic flow goes variables and the relationship between the variables in the application.

2.9   Variable Profitability

Companies use profitability by using indicators ROA (Return on Assets) with the intent to improve the high profit within the meaning of the pecking order theory that companies with a higher profit will use internal funds for utility companies, after the debt, then issue shares.

2.10   Variable Liquidity

According to the pecking order theory, internal cash resources not only of profitability, but also liquidity, using proxy current ratio. Liquidity is upon ability company meet its short term obligations that the company will use internal funds for investment activities and operations and the use of debt will be reduced. (Princess, 2012).

2.11   Variable Firm Size

Firm Size the Company uses with a view to measure the ability of the company and the chemical industry sector basis to meet obligations in short jangja in maintaining stability in order to help shape the company in the event of bankruptcy.

2.12   Variable Business Risk

Business Risk is the risk of the company's base in addition to financial risk in addition to the risk of the company due to the use of debt. The higher the business risk, profitability is also increasingly bankruptcy.

2.13   Variable Growth Opportunities

Is a variable that the condition of the company seen from internal and external growth in the condition of its financial performance and operations, which have an impact on the condition of the company's capital structure.

2.14   Asset Variable Structure

Is a guarantee of the company when making loans. The greater the assets owned by the company, the higher the guarantee to obtain capital from debt.

2.15   Variable Tax-Shield

An effective tax rate paid by the company before profit or corporate profits.

3.   SAMPLE SELECTION AND DATA COLLECTION

The sample in this study of 136 samples, consisting of 17 chemical and basic industry companies listed in Indonesia Stock Exchange 2007-2014 period.

3.1   Operational Definition and Measurement of Variables
3.1.1   Capital Structure

The capital structure is a balance between the use of loan capital consisting of: short-term debt that is permanent, long-term debt with its own capital comprising: preferred stock and common stock (Sjahrial 2009, 179). This study uses the debt ratio as a proxy of the capital structure. Debt ratio by Gitman and Zutter (2012, 77) "measures the proportion of total assets financed by the firm's creditors. According to Gitman and Zutter (2012, 77) formula debt ratio is:

$$\text{Debt Ratio} = \frac{\text{Total Assets}}{\text{Total Liability}}$$

3.1.2   Profitability

This study uses the return on assets (ROA) as a proxy for profitability. According to Gitman and Zutter (2012, 81) return on assets, Often called the return on investment (ROI), measures the overall effectiveness of management in generating profits with its available assets. Return on assets can be measured by the following formula:

$$\text{Return on Equity} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

3.1.3   Liquidity

In this study, using the current ratio as a proxy for liquidity. "Current ratio, a measure of liquidity calculated by dividing the firm's current assets by its current liabilities." (Gitman and Zutter, 2012, 71). Current ratio formula is:

$$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

3.1.4   Firm Size

Wake up and Surianty (2008) in Firnanti (2011) is a measure of company size or the amount of assets owned by the company, which in the proxy with the logarithm of total assets. Then the firm size can be measured by:

$$\text{Firm size} = \log \text{ of total assets}$$

3.1.5   Business Risk

Business risk is the uncertainty in projections of the company on the rate of return or profit in the future (Haryanto, 2012). Formulas growth opportunities in research in research Pattweekongka and Napompech (2014) are:

$$\text{Business Risk} = \frac{\text{Earning before tax}}{\text{Total Assets}}$$

3.1.6   Growth Opportunities

According Indrawati and Suhendro in Deitiana (2011), growth opportunities are changes in the company's total sales. Formulas growth opportunities in research in research Pattweekongka and Napompech (2014) are:

$$\text{Growth Opportunities} = \frac{\text{Years current sales - sales years prerious}}{\text{Previous yearrs sales}}$$

3.1.7   Asset Structure

According to Women (2012) asset structure is the ratio between fixed assets to total assets. Formula asset structure in research in research Pattweekongka and Napompech (2014) are:

$$\text{Asset structure} = \text{fixed-assets Total assets}$$

3.1.8   Tax Shield

According Pattweekongka and Napompech (2014) tax shield is defined from the company tax paid divided by the profit before tax. So the tax shield formula is:

$$\text{Tax Shield} = \frac{\text{Tax Paid}}{\text{Earning before tax}}$$

3.2   Data Analysis

Based on research models, methods of data analysis in research inimenggunakn panel regression data. Data will be analyzed by Eviews 7.

This study regression model, as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + \varepsilon_{it}$$

Information:
Y_{it} = Capital Structure
β_0 = intercept or constant
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ = slope or independent variable coefficients
X_1 = profitability
X_2 = liquidity
X_3 = firm size
X_4 = business risk
X_5 = growth opportunities
X_6 = asset structure
X_7 = tax shield
ε_{it} = random error

4. DISCUSSION

4.1 Descriptive Statistics

Table 2. Statistics descriptive

	DR	PROF	LIQ	SIZE	RISK	GROWTH	ASSET	TAX
Mean	0.383272	0.110095	2.843420	12.08529	0.021928	0.153020	0.370705	0.281932
Median	0.336855	0.098638	2.262253	12.04657	0.013234	0.143149	0.354599	0.267709
Maximum	0.774706	0.356261	9.461559	13.53548	0.165666	1.012116	0.843298	0.916043
Minimum	0.022912	0.000737	0.601692	9.192177	1.78E-05	-0.349923	0.050714	0.070017
Std. Dev.	0.174603	0.079693	1.872949	0.820993	0.025230	0.179173	0.193382	0.093157

4.2 Test of the Significance of Random Effect

Table 3. Hausman test result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.0000000	7	1.0000

In Table 3 the value of Cross-section Chi-Square statistics is 0.000000 and based on the alpha value table Chi-Square 0.05 (df = 7) 14.06714. The probability value of 1.0000 is smaller than the alpha value (0.05). So H0 is not rejected and can be concluded, the model used is Random Effect Model.

4.3 Normality test

Table 4. Normality test

Skewness	0,410833
Kurtosis	3,373429
Jarque-Bera	4,615970
Probability	0,099461

Based on normality test table, skewness coefficient value close to 0 and kurtosis value more than 3. Jarque-Bera value 4,615970 less than Chi-Squares (df) 2 value is 5,991, its probability value (p-value) 0.099461 is more than Alpha value (0.05). So it can be concluded that H0 is not rejected, which means the data is normally distributed.

4.4 Fit Model (Test F)

Table 5. Test F

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.502523	0.218686	2.297922	0.0232
PROF	-0.548969	0.135621	-4.047815	0.0001
LIQ	-0.043549	0.007436	-5.856526	0.0000
SIZE	0.010938	0.018189	0.601332	0.5487
RISK	-0.628773	0.365867	-1.718584	0.0881
GROWTH	-0.041271	0.047687	-0.865467	0.3884
ASSET	-0.035744	0.095200	-0.375460	0.7079
TAX	-0.119933	0.094844	-1.264523	0.2083

According to the table, the regression model is obtained as follows:

$$\hat{Y}it = \beta_0 + \beta_1 X_1 it + \beta_2 X_2 it + \beta_3 X_3 it + \beta_4 X_4 it + \beta_5 X_5 it + \beta_6 X_6 it + \beta_7 X_7 it + \varepsilon it$$

Capital Structure = 0,502523 – 0,548969 PROF – 0,043549 LIQ + 0,010938 SIZE – 0,628773 RISK – 0,041271 GROWTH – 0,035744ASSET – 0,119933TAX + εit

Table 6. Result F test

F-statistic	12.03186
Prob(F-statistic)	0.000000

The results of F-count at Table 6 is 12.03186 worth more than 2,10 F-table is in the rejection of H0 with a p-value of less than 0.000000 alpha value of 0.05. Thus we can conclude that H0 is rejected, so that Profitability, Liquidity, Firm Size, Business Risk, Growth Opportunities, Asset Structure, and Tax Shield together have an influence on Capital Structure.

5. CONCLUSION

From the research, it appears that only a profitability and liquidity variables that affect the capital structure, while the rest did not affect the capital structure. Limitations of this study is the sample used in this study only the basic industry and chemical sector to go public so that the results are less able to generalize companies that go public in Indonesia Stock Exchange. In addition, the study is limited to the independent variables are profitability, liquidity, firm size, business risk, growth opportunity, asset structure and the tax shield. Recommendations can be given for the next researcher is to add sample so with so much data will be more. Adding independent variables suspected of having an influence on the dependent variable (capital structure) such as Research and Development and managerial ownership.

REFERENCES

Anderson, David R., Dennis J. Sweeney, and Thomas A. Williams. 2011. *Statistics for Business and Economics, 11th Edition.* South-Western: Cengage Learning.

Astuti, Kirmizi Ritonga, and Al Azhar. 2014. Pengaruh Pertumbuhan Aset, Profitabilitas, dan Pertumbuhan Penjualan Terhadap Struktur Modal Pada Perusahaan Real Estate Dan Properti Yang Terdaftar Di Bursa Efek Indonesia Periode 2010-2012. *JOM FEKON.* Vol. 1, No. 2: 1-15.

Brigham, Eugene F. and Joel F Houston. 2010. *Essentials of Financial Management, Second Edition*. Singapore: Cengage Learning.

Bisnis. 2014. Permintaan Plastik Naik, Industri Kimia Dasar Diprediksi Tumbuh 8%, Dalam http://industri.bisnis.com/read/20140219/257/204547/permintaan- plastik-naik-industri-kimia-dasar-diprediksi-tumbuh-8 (diakses tanggal 9 Agustus 2015).

Deitiana, Tita. 2011. Pengaruh Rasio Keuangan, Pertumbuhan Penjualan, dan Dividen Terhadap Harga Saham. *Jurnal Bisnis dan Akuntansi.* Vol. 13, No. 1: 57-66.

Fahmi, Irham. 2014. *Manajemen Keuangan Perusahaan dan Pasar Modal*, *Edisi Pertama*. Jakarta: Mitra Wacana Media.

Firnanti, Friska. 2011. Faktor-faktor yang Mempengaruhi Struktur Modal Perusahaan Manufaktur di Bursa Efek Indonesia. *Jurnal Bisnis dan Akuntansi.* Vol. 13, No. 2: 119-128.

Gill, Amarjit and Neil Mathur.2011. Factors that Influence Financisl Leverage of Canadian Firms. *Journal of Applied Finance & Banking*. Vol. 1, No. 2: 19-37.

Gitman, Lawrence J. and Chad J. Zutter. 2012. *Principles of Managerial Finance*, *13th Edition*. Harlow: Pearson Education.

Hanum, Hashemi Rodhian and Zulaikha. 2013. Pengaruh Karakteristik Corporate Governance terhadap Effective Tax Rate (Studi Empiris pada BUMN yang Terdaftar di BEI 2009-2011). *Diponegoro Journal of Accounting.* Vol. 2, No.2: 1-10.

Harahap, Sofyan Syafri. 2011. *Analisis Kritis Atas Laporan Keuangan*. Jakarta: PT Raja Grafindo Persada.

Haryanto, Sugeng. 2012. Karakteristik Perusahaan dan Risiko Bisnis Terhadap Struktur Modal Pada Perusahaan Otomotif. *Jurnal Keuangan dan Perbankan*. Vol. 16, No. 2: 205-214.

Joni and Lina. 2010. Faktor-faktor yang Mempengaruhi Struktur Modal. *Jurnal Bisnis dan Akuntansi*. Vol. 12, No. 2: 81-96.

Karadeniz Erdinc, Serkan Yilmaz Kandir, Mehmet Balcilar dan Yildirim Beyazit Onal. 2009. Determinants of Capital Structure: Evidence from Turkish Lodging Companies. *International Journal of Contemporary Hospitality Management.* Vol. 21, No. 5: 594-609.

Kemenperin. 2013. Industri Petrokimia Bisa Tumbuh Hingga 7%, Dalam http://www.kemenperin.go.id/artikel/5498/Industri-Petrokimia-Bisa- Tumbuh-Hingga-7 (diakses tanggal 9 Agustus 2015).

Khalid Alkhatib. 2012. The Determinants of Leverage of Listed Companies.*International Journal of Business and Social Science.* Vol. 3, No. 24.

Liem, Murhadi, and Bertha Silvia Sutejo. 2013. Faktor-faktor yang Mempengaruhi Struktur Modal Pada Industri *Consumer Goods* yang Terdapat di BEI Periode 2007-2011, *Jurnal Ilmiah Mahasiswa Universitas Surabaya*. Vol. 2, No. 1: 1-11.

Marpaung, E. Indrawati. 2010. Pengaruh Pertumbuhan Penjualan, Leverage Operasi, dan Profitabilitas terhadap Struktur Keuangan. *Jurnal Akuntansi*. Vol. 1, No. 2: 1-14.

Media Industri. 2013. *Pertumbuhan Industri Manufaktur 2013 Ditarget 7, 14%*. No 01: 6-7.

Mishra, Chandra Sekar. 2011. Determinants of Capital Structure – A Study of Manufacturing Sector PSUs in India. *International Conference on Financial Management and* Economics. Vol. 11: 247-252.

Pattweekongka, Supawadee., Kulkanya Napompech. 2014. Determinants of Capital Structure: Evidence from Thai Lodging Companies. *International Journal of Arts & Sciences*. Vol. 07, No. 04: 45-52.

Priambodo Johni Taruna, Topowijono and Devi Farah Azizah. 2014. Pengaruh Struktur Aktiva, Tingkat Pertumbuhan Penjualan dan Profitabilitas terhadap Struktur Modal. *Jurnal Administrasi Bisnis.* Vol. 9, No. 1: 1-9.

Putri, Meidera Elsa. 2012. Pengaruh Profitabilitas, Struktur Aktiva dan Ukuran Perusahaan terhadap Struktur Modal pada Perusahaan Manufaktur Sektor Industri Makanan dan Minuman yang Terdaftar di Bursa Efek Indonesia (BEI). *Jurnal Manajemen*. Vol. 1, No.1: 1-10.

Ruslim Herman. 2009. Pengujian Struktur Modal (Teori Pecking Order): Analisis Empiris Terhadap Saham di LQ-45. *Jurnal Bisnis dan Akuntansi*. Vol. 11, No. 3: 209-221.

Seftianne and Ratih Handayani. 2011. Faktor - faktor yang Mempengaruhi Struktur Modal pada Perusahaan Publik Sektor Manufaktur. *Jurnal Bisnis dan Akuntansi*. Vol. 13, No. 1: 39-56.

Sjahrial, Dermawan. 2009. *Pengantar Manajemen Keuangan*, *Edisi Ketiga*. Jakarta: Mitra Wacana Media.
Sugiyono. 2012. *Metode Penelitian Bisnis*. Bandung: Alfabeta.
T. Afza and A. Hussain. 2011. Determinants of capital structure: A case study of automobile sector of Pakistan, *Interdisciplinary Journal of Contemporary Research in Business*. Vol. 2, No, 10: 219-230.
Tampubolon, Manahan P. 2013. *Manajemen Keuangan, Edisi Pertama*. Jakarta: Mitra Wacana Media.
Widarjono, Agus.2013.*Ekonometrika: Pengantar dan Aplikasinya, Edisi Keempat*.Yogyakarta: UPP STIM YKPN.
Winarno, Wing Wahyu. 2011. *Analisis Ekonometrika dan Statistika dengan EViews*, *Edisi Ketiga*. Yogyakarta