CAPITAL STRUCTURE CHALLENGES: STRATEGIC INSIGHTS FROM INDONESIA'S ENERGY SECTOR

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Abstract
This study examines the factors influencing the capital structure of energy sector companies in Indonesia using panel data analysis. The sample consists of 35 companies over a specified period. The results indicate that Return on Assets, Sales Growth, Asset Utilization Ratio, and Asset Structure significantly affect the capital structure, including short-term debt (STD), long-term debt (LTD), and total debt (TD). These findings align with the pecking order theory, suggesting that companies prefer internal financing over external sources, particularly when profitability is high. The managerial implication is that energy sector companies should carefully consider these variables in their capital structure decisions to enhance sustainability and optimize financial performance.

Keywords: Capital Structure, Pecking Order, Energy Sector

Introduction

The capital structure generally emphasizes the combination of debt and equity to finance companies, with prudent financing decisions being crucial for financial well-being (Alipour et al., 2015). The capital structure is a crucial decision for financial managers in managing a company's finances. Early capital structure theories (Jensen & Meckling, 1976; Modigliani & Miller, 1958, 1963; Myers, 1977; Myers & Majluf, 1984) assume that the company's financing structure is independent of industry characteristics.

Recognition of the determinants of capital structure has been a subject of controversy for years. The capital structure typically remains stable over time (Andres et al., 2014; Lemmon et al., 2008) until changes occur in specific company or macroeconomic variables (Andres et al., 2014; Korajczyk & Levy, 2003). Researchers have made significant efforts to examine these two different categories of determinants of capital structure (Moradi & Paulet, 2019).

According to Weill (2008), financing through debt can have both positive and negative impacts on company performance, influenced by industry background variations, general economic conditions, and other macroeconomic factors. A considerable body of literature on capital structure determinants has investigated specific company characteristics such as growth, size, profitability, asset tangibility, non-debt tax shields, tax shields, income volatility, industry classification, risk, stock return, intangible assets, liquidity, internal fund availability, equity agency costs, operational leverage, financial constraints, age, default probability, regulations, internal ownership, firm value, and uniqueness (Moradi & Paulet, 2019).

Empirical findings from Li & Islam (2019) indicate that certain company-specific factors vary across industries, while previous studies found similar impacts of these factors. Moreover, Li & Islam (2019) found that industry-specific factors directly and indirectly impact the formation of a company's capital structure, but the outcomes of some industry-specific factors depend on the choice of debt ratios.

Vo (2017) considers a wide range of company attribute variables (asset growth, tangible asset ratio, profitability, company size, and liquidity) in explaining the capital structure, where determinants of capital structure differ for long-term and short-term leverage. Campbell & Rogers (2018) explain their empirical findings that companies with the highest debt volatility tend to be smaller and less profitable. However, given the significant differences among many industries in terms of company operations and supply-demand throughout the operational cycle, it is unlikely that a universally applicable capital structure theory can be applied to all industries (Hall et al., 2000).

This study focuses on the energy sector in Indonesia, which is a key commodity in the modern economy, especially in the sub-sectors of oil, gas, and coal. Its capital-intensive, technologically intensive, and high-risk business characteristics not only impact the economy but are also unsustainable and have negative environmental implications (Fadila et al., 2022).

Energy plays a crucial role in every aspect of life with the world's development. The demand for resources such as oil, coal, natural gas, biofuels, and renewable energy such as nuclear, water, wind, and solar continues

to rise (Georgakopoulos et al., 2022). Georgakopoulos et al (2022) state that the energy industry faces significant challenges involving greenhouse gas emissions, climate change, and geopolitics, among other determining factors. Therefore, companies in this industry need to continuously consider these factors and make wise decisions both internally and externally.

The energy industry's transformation, driven by technological advances and digital innovations, is vital in ensuring sustainable growth and addressing the sector's environmental challenges. The digitalization of the energy sector can enhance operational efficiency, optimize resource utilization, and support the transition towards cleaner energy sources. This research, therefore, exploring how capital structure decisions in the energy sector can be optimized in the face of evolving digital and environmental imperatives.

If the available financing alternatives for energy companies depend on industry characteristics, these characteristics become important input variables in the financial management process. This variable can then influence whether a company finances new investments with long-term and/or short-term debt and/or equity. This could be a crucial consideration for financial managers, and the results of this analysis are not only important for academic research in capital structure but also for the day-to-day operations of companies in the energy industry.

This research is driven by several objectives. First, this research is based on the evolving literature on capital decisions. It is well known that determinants of capital structure differ in each country (Vo, 2017). Specifically, Črnigoj & Mramor (2009) state that although previous research has proven that some differences in capital structure can be explained by modern capital structure theories in mature market economies, the capital structure decisions in emerging markets remain an open question for investigation.

Second, this research considers capital structure decisions in the focus of companies in the energy sector in Indonesia. According to the report from EMIS Insights (2023), Indonesia has long considered the oil and gas sector as a vital pillar of the economy, with the participation of foreign and domestic companies in exploration and production activities. The energy sector in Indonesia dominates the index with a percentage of 77.76%, with a total market capitalization of 1,423,986 trillion (IDX Energy Fact Sheet, 2022).

This study contributes to the literature in two aspects. First, it provides primary evidence regarding the puzzling capital structure in Indonesia with a focus on the energy sector. Second, the research forms a series of capital structure components, namely short-term debt (STD), long-term debt (LTD), and total debt (TD), as well as various firm-specific factors such as sales growth, asset structure, asset utilization ratio, and profitability indicators as specific determinants of capital structure in this empirical analysis.

Research Methodology

This research investigates the determinants of capital structure using energy companies in Indonesia. Companies that have reported annual reports without significant gaps for this period are selected. The sample in this study summarizes data from companies in the energy sector listed on the Indonesia Stock Exchange during the period 2012 - 2021. Sample selection criteria involve companies listed on the Indonesia Stock Exchange from 2012 to 2021 and having complete financial data throughout the research period. Information about the companies is obtained from sources such as EMIS (emerging markets research, data and news) website, IDX, and the companies' annual financial reports.

The method used in this research is panel data regression analysis with variables outlined in the table above using statistical software. The study forms a series of capital structure components, namely short-term debt (STD), long-term debt (LTD), and total debt (TD). As discussed, profitability and firm-specific factors are explanatory variables in this study.

In this literature, profitability is measured using return on sales (ROS), which is operating profit divided by sales, and return on assets (ROA), calculated with net income divided by total assets. Asset structure (STRUCT) is measured with fixed assets divided by total assets. Company growth (SGROW) represents annual sales growth. The Asset Utilization Ratio (AUR) is measured by sales divided by total assets.

Results and Discussion
Descriptive Statistics and Correlation Analysis

Table 1 below explains the definition and descriptive statistics of each variable. The research sample consists of 30 energy sector companies on the Indonesia Stock Exchange, where, on average, total debt in this sector is approximately 29.66% of its total assets.

Table 1. Summary Statistics

Variable	Definiton	Mean	SD	Min	Max
STD	*Short-term debt/Total Asset*	0.100164	0.116242	0.000000	0.603961
LTD	*Long-term debt/Total Asset*	0.196492	0.177704	0.000000	0.799544
TD	*The sum of long-term debt and short-term debt divided by total assets*	0.296656	0.205360	0.000000	0.981492
ROA	*Net Profit/Total Assets*	0.015116	0.146335	-1.113700	0.520200

ROS	*Operating Profit/Net Sales*	0.087867	0.556190	-3.112300	4.960400
SGROW	*Annual growth in sales*	3.368756	60.72267	-0.998500	1136.032
STRUCT	*Fixed assets divided by total assets*	0.461837	0.207414	0.000200	0.941800
AUR	*sales divided by total assets*	1.640656	18.95818	0.000443	355.2019

Based on the research data on energy sector companies on the Indonesia Stock Exchange over the period 2012-2021, there are several relevant findings describing the characteristics and financial conditions of companies. The average short-term debt (STD) of companies is 0.100164, indicating that the average proportion of short-term debt to total assets is about 10.02%. This suggests that a small portion of the company's total assets is allocated to short-term debt. In line with this, the average long-term debt (LTD) of 0.196492 illustrates that the average proportion of long-term debt for companies is about 19.65%, indicating a tendency for companies to use long-term funding sources.

Furthermore, the average total debt (TD) of 0.296656 reflects that the average proportion of total debt for companies is around 29.67%. In other words, about 29.67% of the company's total assets are financed through debt. In terms of profitability, the average return on assets (ROA) of 0.015116 indicates that the average profitability of companies is about 1.51%. Meanwhile, return on sales (ROS) with an average of 0.087867 indicates profitability more specifically related to sales, approximately 8.79%.

The average sales growth (SGROW) of about 3.368756 reflects a significant growth rate in the business of energy sector companies. Regarding asset structure, the average Asset Structure (STRUCT) of 0.461837 illustrates that about 46.18% of the company's total assets consist of fixed assets. Meanwhile, the Asset Utilization Ratio (AUR) with an average of 1.640656 indicates that companies can utilize their assets around 164.07% to support their operations. Overall, the descriptive statistics provide an in-depth overview of the composition of capital structure and financial characteristics of energy sector companies in Indonesia.

Table 2 depicts the correlation matrix between variables. There is a negative correlation between long-term debt and short-term debt. Profitability with ROA measurement consistently has a negative correlation with all three components of capital structure, while ROS only has a negative correlation with short-term debt. Moreover, the direction of the relationship between capital structure and other potential determinants tends to vary for long-term and short-term debt.

Table 2. Correlation Coefficients Matrix

Variabel		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	STD	1							
(2)	LTD	-.076	1						
(3)	TD	.503*	.823*	1					
(4)	ROA	-.263*	-.178*	-.302*	1				
(5)	ROS	-.067	.066	.024	.377*	1			
(6)	STRUCT	.076	.252*	.262*	-.252*	-.260*	1		
(7)	SG	-.022	.018	.003	.028	.019	.070	1	
(8)	AUR	-.024	.012	-.003	.034	.018	.065	1.000*	1

***. Correlation is significant at the 0.1 level (2-tailed).
**. Correlation is significant at the 0.05 level (2-tailed).
*. Correlation is significant at the 0.01 level (2-tailed).

Source: Data Processing Results, 2023

Regression Results and Discussion

The summarized table of the panel regression results for the three models of capital structure components is presented in Table 3 below. From the model selection results, random effects were obtained as the suitable model for all three components of the capital structure in this study.

Tabel 3. Summary Regression Results

Variables	Model 1	Model 2	Model 3
Dependent Variables	**STD** *Random Effect*	**LTD** *Random Effect*	**TD** *Random Effect*
C	1.488512 (0.0000)	1.313589 (0.0000)	1.524062 (0.0000)
ROA	**-0.110297 (0.0262)***	-0.050660 (0.4015)	**-0.129586 (0.0227)***
ROS	-0.030177 (0.1548)	0.046224 (0.0751)	0.009250 (0.7039)
SGROW	0.042905 (0.7379)	**0.454893 (0.0050)***	**0.417420 (0.0066)***
STRUCT	-0.009362 (0.8413)	**0.196248 (0.0024)***	**0.182834 (0.0042)***
AUR	-0.079037 (0.7365)	**-0.831295 (0.0051)***	**-0.763047 (0.0067)***
Lagrange Multiplier	0.000	0.000	0.000

Hausman Test	-	-	-
F-Stat (Prob F-stat)	2.558004 (0.027294)*	5.290574 (0.000107)*	5.951314 (0.000027)*
R^2	0.035847	0.071407	0.079615
Adjusted R^2	0.021834	0.057910	0.066237
N	350	350	350

Source: Data Processing Results, 2023

Partial Regression Results and Discussion for Short-Term Debt STD

Based on the partial test results for the dependent variable short-term debt (STD), the analysis indicates that only the return on assets (ROA) variable has a significant influence on short-term debt. The significant probability ($0.0262 \leq 0.05$) and the negative regression coefficient on ROA indicate a significant negative relationship between company profitability, measured through ROA, and the level of short-term debt (STD). This result aligns with the pecking order theory, stating that more profitable companies have lower debt ratios; indeed, more profitable companies do not require external financing and often use internal financing, resulting in less debt in their capital structure. This suggests that highly profitable companies tend to fund investments with retained earnings rather than using debt.

According to Sikveland et al. (2022), the primary purpose of STD is to ensure that the company has cash available for day-to-day operations. Therefore, especially when the company's revenue is insufficient to cover its operational needs, STD can be a beneficial source of capital. Meanwhile, the return on sales (ROS) variable was found to have no significant influence ($0.1548 > 0.05$). This indicates that ROS does not have a significant impact on short-term debt (STD). The estimated coefficients for return on sales (ROS) show that profitable companies use less short-term debt financing. Thus, from the profitability perspective, it supports the pecking order theory, as evidenced by the negative coefficient on profitability, indicating evidence for POT, where more profitable companies tend to use less debt when financing their activities. This result is consistent with studies (Alipour et al., 2015; Chittenden et al., 1996; Moradi & Paulet, 2019; Riise & Yssen, 2022; Sikveland et al., 2022; Vo, 2017; Wieczorek-Kosmala et al., 2021).

However, for firm-specific factors, namely the Sales Growth (SGROW), Asset Structure (STRUCT), and Asset Utilization Ratio (AUR) variables, they do not show a significant influence on short-term debt. The non-significant impact of SGROW, STRUCT, and AUR indicates that sales growth, asset structure, and asset utilization ratio do not significantly affect the short-term debt policies of energy sector companies in Indonesia. This aligns with the internal corporate financial decision theory, pecking order theory, Modigliani Miller, and the concept of asset utilization efficiency that does not directly affect debt policy.

Overall, these results provide an overview that in the context of energy sector companies on the Indonesia Stock Exchange, profitability factors, especially ROA, play a crucial role in short-term debt usage policies. The implication is that more profitable companies tend to have a capital structure less dependent on short-term debt. This condition explains that energy sector companies with higher profitability tend to borrow less short-term debt because the coefficient for profitability is negative and significant in the regression explaining short-term debt.

Partial Regression Results and Discussion for Long-Term Debt (LTD)

Based on the partial test results for the dependent variable long-term debt (LTD), it can be observed that the variables ROA and ROS do not have a significant influence on LTD, as the probability values (Prob.) for both are greater than the significance level of 0.05. This implies that profitability, measured through both ROA and ROS, does not significantly contribute to determining long-term debt in energy sector companies in Indonesia. The regression coefficients for the ROA variable indicate a negative relationship with the use of long-term debt, while the regression coefficients for the ROS variable indicate a positive relationship with the use of long-term debt. However, the level of company profitability, as measured by ROA and ROS, does not significantly affect the company's decision to use long-term debt.

Furthermore, Sikveland et al (2022) explain that the main advantage of LTD over STD is that the company has a longer time to repay the loan and can thus finance larger investments in long-term projects. LTD is used to finance investments necessary to maintain existing capacity and to fund expansions and new projects (Sikveland et al., 2022).

The Sales Growth (SGROW) variable shows a significant positive influence on long-term debt (LTD), with a probability value of 0.005, which is smaller than the significance level of 0.05. This result aligns with the pecking order theory, where high sales growth can trigger the company's need for long-term financing to support expansion and new projects. On the other hand, energy sector companies tend to be optimistic about projections or existing developments, so this growth condition encourages companies to increase the use of long-term debt. This result is consistent with research by (Jaworski & Czerwonka, 2021; Sikveland et al., 2022).

The Asset Structure (STRUCT) variable also provides a significant positive influence on LTD, with a probability value of 0.00240. This indicates that companies with a larger asset structure tend to use more long-

term debt. This is in line with the pecking order theory and trade-off theory, indicating a positive relationship between asset structure and the use of long-term debt. The research results show that energy sector companies in Indonesia have a higher proportion of fixed assets funded by long-term debt. Given that this is a proxy for collateral, it also suggests that banks will be more willing to provide long-term loans if the company's collateral is relatively high compared to its total assets (Sikveland et al., 2022). However, the negative (positive) relationship found between asset structure and the short-term (long-term) debt ratio implies that energy sector companies in Indonesia are trying to finance their fixed assets with long-term debt and their current assets with short-term debt, thus supporting the asset maturity matching principle in companies.

These results also indicate that energy sector companies tend to be required to provide collateral for both long-term and short-term loans. Asset structure has a negative relationship with short-term debt but has a positive relationship with long-term debt. Companies with higher tangible assets use less short-term debt for a more flexible financial structure (Vo, 2017). This result is consistent with studies by (Alipour et al., 2015; Ghani et al., 2023; Jaworski & Czerwonka, 2021; Sikveland et al., 2022; Vo, 2017).

The Asset Utilization Ratio (AUR) has a significant negative influence on LTD, with a probability value of 0.0051. This result indicates that the higher the asset utilization ratio, the lower the level of long-term debt usage. This can be explained by the assumption that companies efficient in utilizing their assets tend to require less long-term financing. This indicates that energy sector companies can optimize asset utilization to reduce long-term debt, in line with agency theory and FCFT where the higher this ratio, the more efficient managers are in adopting and utilizing assets. This result contradicts the findings of (Alipour et al. (2015).

In the context of the energy sector in Indonesia, these findings provide insights that sales growth and asset structure are important factors influencing the use of long-term debt, while efficiency in asset utilization can reduce the company's need for long-term debt.

Partial Regression Results and Discussion for Total Debt (TD)

In the context of the third dependent variable, Total Debt (TD), the partial test results indicate a significant influence from several independent variables. First, Return on Assets (ROA) has a negative influence on TD, indicating that companies with higher ROA tend to have lower total debt. This result is consistent with the pecking order theory, which assumes that more profitable companies can finance their investments with retained earnings without relying on external debt. However, Return on Sales (ROS) does not show a significant influence on TD in the context of this study. This can be interpreted as profitability, as measured by ROS, not being a major factor affecting the total debt in the capital structure of energy sector companies in Indonesia. This result aligns with (Alipour et al., 2015; Jaworski & Czerwonka, 2021; Moradi & Paulet, 2019; Riise & Yssen, 2022).

Sales Growth (SGROW) shows a positive influence on TD, meaning that the higher the sales growth, the higher the total debt of the company. The positive and significant coefficient of sales growth (SGROW) indicates that energy sector companies experiencing growth will increase their total debt through an increase in long-term debt. Given that long-term debt reveals a negative relationship between profitability (ROA) and total debt, this indicates a negative correlation between profitability and total debt. This finding contradicts the trade-off theory, which suggests that companies with greater investment opportunities tend to have higher levels of debt. According to Myers (1977), significant investment opportunities can exacerbate agency problems between managers and creditors, typically predicting a positive relationship between growth and debt. Conversely, this result supports the Pecking Order Theory (POF); debt is expected to have a positive relationship with growth because growing companies may not have the internal capital needed to finance future growth, as that capital may already be depleted in financing existing growth (Sikveland et al., 2022). This result aligns with (Jaworski & Czerwonka, 2021; Sikveland et al., 2022).

Asset Structure (STRUCT) also contributes positively to TD, indicating that companies with a higher proportion of fixed assets tend to have larger total debt. This aligns with literature stating that fixed assets can be used as collateral by banks to support long-term debt issuance. Large companies (in line with (Karadeniz et al., 2009)) and companies with more collateral also have higher total debt levels, indicating that the net effect of substitution between long-term and short-term debt for these companies results in larger total debt (Sikveland et al., 2022). This result aligns with research (Ghani et al., 2023; Jaworski & Czerwonka, 2021; Riise & Yssen, 2022; Sikveland et al., 2022).

Asset Utilization Ratio (AUR) has a negative influence, meaning that the higher the efficiency of asset utilization, the lower the total debt. This result shows that energy sector companies have the ability to effectively utilize their assets to reduce external financing. This result contradicts the findings of (Alipour et al., 2015). Overall, in the context of the energy sector in Indonesia, factors such as profitability, sales growth, asset structure, and asset utilization ratio are key factors in the capital structure decisions of companies.

Conclusion

This study provides important insights into the capital structure of energy sector companies in Indonesia. The findings reveal that these companies tend to favour long-term debt over short-term debt, with an average

long-term debt proportion of 19.65%. Despite this, the overall debt level remains relatively low, at 29.67% of total assets. This is supported by a high asset utilization ratio, indicating efficient use of assets, which reduces reliance on external debt.

The study also finds a significant relationship between asset structure and debt ratios, where companies align their financing strategies with the asset maturity matching principle. The preference for internal financing over debt, consistent with the pecking order theory, highlights the importance of profitability in minimizing debt reliance.

Key variables such as Return on Assets (ROA), Sales Growth (SGROW), Asset Structure (STRUCT), and Asset Utilization Ratio (AUR) significantly influence different components of capital structure, indicating that companies with higher profitability and efficient asset utilization tend to use less debt. The positive impact of asset structure on long-term debt suggests that increasing fixed assets can support a more balanced capital structure.

Overall, the results underscore the relevance of pecking order theory, agency theory, and free cash flow theory in explaining capital structure decisions within the energy sector in Indonesia. Managers in this sector should prioritize internal financing, optimize asset utilization, and consider the strategic role of fixed assets in maintaining an optimal capital structure.

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