

Unravelling the Factors Affecting Information Asymmetry: Analysis of Energy Companies on the Indonesia Stock Exchange

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Abstract— This study aims to determine how leverage, company size, stock price and stock trading volume affect information asymmetry. The population in this study are energy companies listed on the Indonesia Stock Exchange. The sampling technique used in this study was purposive sampling with a total sample size of 45 companies from a total population of 87 companies with a research period of 2021-2023. This research uses a quantitative approach. The data analysis technique uses multiple linear regression analysis. The results showed that leverage, company size and stock price have a significant effect on information asymmetry, while trading volume has no significant effect on information asymmetry. Companies with high leverage, small size, and low stock prices tend to have higher levels of information asymmetry. However, stock trading volume does not have a significant effect on information asymmetry because the energy industry has unique and high-risk characteristics; thus stock trading volume does not indicate information asymmetry compared to other industries. Future research is expected to conduct research in other sectors and also extend the research time period so that the results of further research can be used in the long term.

Keywords— *Energy; Information Asymmetry; Leverage; Size; Stock; Trading Volume*

I. INTRODUCTION

In an era where sustainability is increasingly becoming a key focus in the business world, understanding information asymmetry is even more important to achieve sustainable goals. Information asymmetry must be minimized because when it is not considered, these things will not be realized. Information asymmetry refers to a situation where one side has more knowledge or access to information than other parties. In this context, companies often have more in-depth information about their sustainability performance than investors. Companies that disclose their environmental, social and governance (ESG) performance aim to address the information asymmetry between companies and investors. Investors often lack access to reliable and comparable ESG data, making it difficult to assess a company's true sustainability performance and make informed investment decisions [1]. Furthermore, the importance of the relevance of information asymmetry in the Asia-Pacific region is particularly striking, given the unique economic dynamics and business environment in the region. The Asia-Pacific region is known for its rapid economic growth, making information asymmetry a significant challenge for businesses in the region to adopt sustainable business practices [2]. Information imbalances between business stakeholders can hinder informed decision-making, thus hindering the transition towards sustainable business models.

Information asymmetry occurs when agents, such as company managers, have more knowledge about the condition of the company than the principals, such as shareholders [3]. This information imbalance opens a gap for agents to take actions that benefit themselves, such as manipulating financial reports or hiding important information without the knowledge of the principal. This can result in losses for the principal [4]. Agency theory explains how information asymmetry can lead to conflicts of interest between agents and principals. Agents are tempted to act in their own interests rather than the interests of the principal, especially if they have more information than the principal. In this relationship, the principal delegates duties and responsibilities to the agent to manage the company. However, information asymmetry

arises when the agent has more information about the company and its prospects than the principal. This can happen because the agent has direct access to the company's operations and finances, while the principal only gets information through financial reports and official communications. There are several indicators that cause information asymmetry, namely leverage, company size, stock price and stock trading volume.

Leverage is the level of debt usage in a company's capital structure. Information asymmetry can encourage companies to use leverage opportunistically, and high leverage can exacerbate information asymmetry. Previous research shows that leverage has a significant positive effect on information asymmetry because leverage is considered a risk for investors, so the greater the leverage, the higher the risk, the lower the information asymmetry [5] and [6]. However, other research state that leverage has a negative effect on information asymmetry, meaning that the company's ability to obtain fixed assets whose source of fixed asset acquisition comes from non-debt can have an impact on the company's share price [7] and [8] while several studies have found that leverage does not affect information asymmetry [9], [10] and [11].

H1 : Leverage has a significant effect on information asymmetry.

Company size can be measured by total assets and revenue. Large companies generally have lower information asymmetry than small companies, which may give them an advantage in terms of access to capital, cost of capital, and growth opportunities because large companies have a greater tendency to disclose more accurate information to investors and shareholders. Therefore, company size has a strong influence on corporate information disclosure [12]. The test results show that company size has a negative and significant effect on information asymmetry. This is because the greater the total assets of a company, the easier it is for the company to diversify its business [13], [10] and [4]. Other research also shows that company size has a negative but insignificant effect on information asymmetry; this is because there are several companies that when the size of the company increases, the information asymmetry also increases [14] while according to [15], research found that company size does not affect information asymmetry.

H2 : Company size has a significant effect on information asymmetry.

The stock price is the market value of one share of a company that often does not reflect the intrinsic value of the company. This is due to information asymmetry, where investors do not have access to sufficient information about the company. This information imbalance can cause unreasonable stock price fluctuations, where the stock price can be too high or too low compared to the company's actual value. Previous research shows that the stock price has a significant positive effect on information asymmetry; this indicates that investors favor the shares; this situation also always makes the dealer not immediately release the shares, but the shares are held first until a certain time [16] and [17]. However, stock prices also have a negative and significant effect on information asymmetry in other research. This indicates that the higher the stock price, the lower the information asymmetry [18], [19], [20], and [21], while several studies have found that stock prices do not affect information asymmetry [22] and [23].

H3 : Stock price has a significant effect on information asymmetry.

Stock trading volume is the buying and selling activity level of a company's shares in the capital market. An increase in trading volume can be a signal for other investors to investigate new information that causes information asymmetry. Previous research shows that stock trading volume positively affects information asymmetry; these results indicate that when a stock is actively traded, it will increase information asymmetry [8] and [20]. However, other findings show stock trading volume has a significant negative effect on information asymmetry. This condition causes dealers not to hold shares for too long, which results in a decrease in the cost of ownership of shares [13] and [18], while some studies show that stock trading volume does not affect information asymmetry [24], [19], and [21].

H4 : Stock trading volume has a significant effect on information asymmetry.

II. RESEARCH METHODS

This type of research uses associative research with quantitative methods that aim to determine the effect between two or more variables. The population in this study are energy companies listed on the Indonesia Stock Exchange from 2021-2023. Samples will be taken from this population based on a

nonprobability approach using purposive sampling method with the following sampling criteria: (1) Companies that have conducted an Initial Public Offering (IPO) on the Indonesia Stock Exchange before 2021. (2) Companies that report annual financial reports consistently from 2021 - 2023. (3) Companies that have complete data on bid-ask prices, closing prices, volume of shares traded and number of shares outstanding in 2021-2023. Based on these criteria, a sample of 45 companies that met the criteria was selected from a total population of 87 companies.

Table 1. Table of Sampling

No.	Criteria	Total
	Energy companies listed on the Indonesia Stock Exchange	87
1	Companies that did not conduct an Initial Public Offering (IPO) before 2021	(21)
2	Energy companies that do not publish annual financial reports consistently and completely from 2021 - 2023	(10)
3	Companies that do not have complete data on bid-ask prices, closing prices, volume of shares traded and number of shares outstanding in 2021-2023	(11)
	Companies selected as samples	45

Source: Secondary Data Processed (2024)

The data used in this study is secondary data, which is the publication of the company's financial statements and annual stock prices. Data sources were obtained from the Indonesia Stock Exchange website, the company website, and Yahoo Finance. The data in this study were processed using the SPSS version 26 program with data analysis techniques using multiple linear regression analysis that has passed the classical assumption test. The research variables used in this study are leverage, company size, stock price and stock trading volume as independent variables and information asymmetry as the dependent variable.

Information Asymmetry

Information asymmetry is an imbalance of information between the market and management who do not have the same information about the company. In this study, information asymmetry is measured using the Relative Bid-Ask Spread. The bid-ask spread formula is in accordance with [25] as follows:

$$Spread_{it} = \left[\frac{Ask_{it} - Bid_{it}}{(Ask_{it} + Bid_{it})/2} \right] \times 100\% \quad (1)$$

Description :

Spread_{it} = Bid-Ask Spread of stock i on t

Ask_{it} = Ask price spread of stock i on t

Bid_{it} = Bid price of stock i on t

Leverage

Leverage is the company's ability to use funds that have a fixed burden or debt effectively, so as to obtain an optimal level of business income. The leverage variable can be calculated with the following formula [26]:

$$Leverage = \frac{Total Liability}{Total Assets} \quad (2)$$

Company Size

Company size is the size or size of the company which can be measured by the value of total assets, net sales, or equity value. The company size variable can be calculated using the following formula [27]:

$$Company Size = Ln (Total Assets) \quad (3)$$

Stock Price

Stock price is the price set for a stock when the stock market is in progress, taking into account the demand and supply of the stock [27]. In accordance with research [18] the stock price variable can be calculated using the natural logarithm value of the stock price and the closing price of each stock is used.

Stock Trading Volume

Stock trading volume shows the ratio between the number of company shares traded in the capital market at a certain time and the number of shares outstanding. In accordance with research [13] the stock trading volume variable can be calculated using the following formula:

$$\text{Stock Trading Volume} = \frac{\Sigma \text{Stocks Traded}}{\Sigma \text{Outstanding Shares}} \quad (4)$$

The analytical tool used in this research is multiple linear analysis techniques. The multiple regression equation in this study uses the following model:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Y	= Information Asymmetry
α	= Constant value
$\beta_1, \beta_2, \beta_3, \beta_4$	= Koefisien regresi variabel independen
X_1	= Leverage
X_2	= Company Size
X_3	= Stock Price
X_4	= Stock Trading Volume
ε	= Standard error

III. RESULT AND DISCUSSION

Descriptive Analysis

Table 2. Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
X1	135	-3.65	.88	-.9926	.79700
X2	135	3.09	3.49	3.3749	.06688
X3	135	1.36	2.42	1.8781	.23526
X4	135	-17.49	4.90	-4.4241	3.31449
Y	135	-1.06	3.24	1.2086	.72849
Valid N (listwise)	135				

Source: Data Processed by SPSS (2024)

Based on Table 2, the results of the descriptive statistics test of energy sector companies with 135 data show that the independent variable, namely leverage (X1) has a minimum value (-3,65), maximum (0,88), average (-0,9926) and standard deviation (0,79700). The independent variable, namely company size (X2), has a minimum value of (3,09), maximum (3,49), average (3,3749) and standard deviation (0,06688). The independent variable, namely stock price (X3), has a minimum value (1,36), maximum (2,42), average (1,8781) and standard deviation (0,23526). The independent variable, namely stock trading volume (X4), has a minimum value (-17,49), maximum (4,90), average (-4,424) and standard deviation (3,31449). The dependent variable, namely information asymmetry (Y), has a minimum value (-1,06), maximum (3,24), average (1,2086) and standard deviation (0,72849).

Multiple Linear Regression Analysis

Table 3. Multiple Linear Regression Analysis

Model	Coefficients ^a		Standardized Coefficients Beta	t	Sig.
	Unstandardized Coefficients B	Std. Error			
1	(Constant)	10.553	3.221	3.276	.001
	LN X1	.278	.082	3.387	.001
	LN X2	-2.141	.985	-2.175	.032
	LN X3	-.943	.325	-2.900	.004
	LN X4	.009	.021	.409	.683

Source: Data Processed by SPSS (2024)

The multiple regression equation based on the results of data processing using SPSS is as follows:

$$Y = 10,553 + 0,278X1 - 2,141X2 - 0,943X3 + 0,009X4$$

The regression equation results can be explained as follows: The constant value (α) of 10,553 indicates that if the independent variable has a zero value, the dependent variable will produce a value of 10,553. The regression coefficient value for the leverage variable (X1) is 0,278, which is positive. This shows that with every increase in leverage by one unit, the information asymmetry will increase by 0,278. The regression coefficient value for the firm size variable (X2) is -2,141, which is negative. This shows that with each increase in company size by one unit, the information asymmetry will decrease by 2,141. The regression coefficient value for the stock price variable (X3) is -0,943, which is negative. This shows that with every increase in stock price by one unit, the information asymmetry will decrease by 0,943. The regression coefficient value for the stock trading volume variable (X4) is 0,009, which is positive. This shows that with every increase in stock trading volume by one unit, the information asymmetry will increase by 0,009.

Test Coefficient of Determination (R2)

Table 4. Table Coefficient of Determination (R2)

Model	Model Summary			
	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.441 ^a	.195	.167	.66490

Source: Data Processed by SPSS (2024)

The test results of the coefficient of determination (R2) there is an Adjusted R Square value of 0,167. This means that the influence of the leverage variable, company size, stock price, and trading volume on the information asymmetry variable is 16,7%, while the remaining 83,3% is influenced by other variables not examined in this study the statistics required and discuss the findings.

F Test

Table 5. F Test

		ANOVA ^a				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.491	4	3.123	7.064	.000 ^b
	Residual	51.724	117	.442		
	Total	64.215	121			

Source: Data Processed by SPSS (2024)

The results of the F test in this study have a significant value $0,000 < 0,05$, so the hypothesis is accepted, which means that the leverage variable, company size, stock price, and trading volume simultaneously affect the information asymmetry variable.

T Test

Table 6. T Test

		Coefficients ^a				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.553	3.221		3.276	.001
	LN_X1	.278	.082	.296	3.387	.001
	LN_X2	-2.141	.985	-.198	-2.175	.032
	LN_X3	-.943	.325	-.255	-2.900	.004
	LN_X4	.009	.021	.034	.409	.683

Source: Data Processed by SPSS (2024)

The t-test results in Table 5 show that leverage has a significant effect on information asymmetry, as evidenced by the significance level of 0,001, below the 0,05 threshold. Company size also significantly affects information asymmetry, with a significance level of 0,032, again lower than 0,05. Similarly, stock price significantly affects information asymmetry, indicated by a significance level of 0,004, smaller than 0,05. In contrast, stock trading volume has no significant effect on information asymmetry. The significance level of 0,683 exceeds the criterion of 0,05, indicating no significant effect.

Discussion of Research Results

The findings of this study indicate that leverage significantly affects information asymmetry, thus confirming the first hypothesis. This study's outcomes align with the findings of [5] and [6], both of which retrieved that leverage has a significant and positive impact on information asymmetry. This means that companies with high leverage tend to have higher information asymmetry. This condition is caused by companies with high leverage having more debt, thereby increasing the risk of company failure. However, the results of this study differ from the results of research conducted by [7] and [8], which show that leverage has a negative and significant effect on information asymmetry, but in contrast to the results of research [9], [10] and [11] which state that leverage does not affect information asymmetry.

The results of this study indicate that company size significantly affects information asymmetry, which leads to the acceptance of the second hypothesis. The findings of this study are consistent with previous research [13], [10] and [4], which shows that company size has a significant negative effect on information asymmetry. This means that large companies generally have a lower level of information asymmetry than small companies. Large companies generally have a more transparent financial reporting system and better governance. However, the findings of this study differ from the conclusions reached in the study [14], which demonstrate that firm size has a negative but statistically insignificant impact on information asymmetry, but in contrast to the results of research [15], which state that company size does not affect information asymmetry.

The stock price variable significantly affects information asymmetry, thus confirming the third hypothesis. The findings of this study are in line with previous research [18], [19], [20] and [21], which shows that stock prices have a significant negative effect on information asymmetry. This means that companies with high stock prices generally have a lower level of information asymmetry than companies with low stock prices. This is because investors tend to consider companies with high stock prices more transparent and credible. However, the results of this study differ from the results of research conducted by [16] and [17], which show that stock prices have a positive effect on information asymmetry, but in contrast to the results of research [22] and [23] which state that stock prices do not affect information asymmetry.

The stock trading volume variable has no significant effect on information asymmetry, so the fourth hypothesis is rejected. The results of this study are supported by research [24], [19] and [21], which shows that stock trading volume does not affect information asymmetry. This condition occurs because stock prices in the energy sector are volatile and closely related to commodity prices such as oil, gas, and coal. These price fluctuations can encourage high trading volume but do not necessarily reflect information asymmetry. However, the results of this study differ from the results of research conducted by [8] and [20], which show that stock trading volume has a significant positive effect on information asymmetry, but in contrast to the results of research [13] and [18] which states that stock trading volume has a significant negative effect on information asymmetry.

IV. CONCLUSION

Based on data analysis, leverage, company size, and stock price have a significant effect on information asymmetry in energy companies. This happens because firms with high leverage tend to hide negative information to avoid negative impacts on stock value and borrowing costs. However, large companies generally have a better and more transparent financial reporting system, thus reducing information asymmetry. The analysis of stock prices reinforces this finding; a sharp decline in stock prices can indicate hidden negative information, while an unexpected increase in stock prices indicates the presence of positive information that has not been published. This reflects investors' expectations of the company's future performance based on the information they have. On the contrary, the stock trading volume does not significantly affect information asymmetry because energy companies are often subject to strict regulations, which can limit the flexibility of companies in disclosing information. This can lead to fluctuations in stock trading volume that do not always accurately reflect information asymmetry.

In terms of theory, this study specifically focuses on energy companies with unique characteristics and risks compared to other industries. This study also uses a more complete empirical model by including leverage, firm size, stock price, and stock trading volume variables. This allows researchers to identify a more complex relationship between information asymmetry and its influencing factors. Furthermore, this research has important implications for sustainable business development in the Asia-Pacific region. Investors who are more confident in the information they receive about energy sector companies are more likely to invest in companies that implement sustainable business practices. Information asymmetry can be a barrier to sustainable business development. However, by increasing transparency and accountability, companies can build trust and open the gateway to sustainability. The trust built will attract capital and support for sustainable initiatives, such as investments in renewable energy, energy efficiency, and other green technologies. As such, this research reveals barriers and opens up new opportunities for companies and stakeholders to move towards a more sustainable future.

Future researchers are expected to extend the research period to collect more complete and accurate data so that the results of further research can be used in the long term. In addition, further research can be conducted in other sectors, such as banking, industry, or manufacturing. Research can also be continued in other countries in the Asia Pacific region to compare research results in Indonesia with existing conditions in other countries.

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