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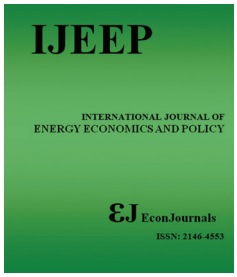

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Coal Price and Profitability: Evidence of Coal Mining Companies in Indonesia

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ABSTRACT

The study examines the influence of certain industrial factors, namely the reference price for Indonesian coal (HBA), and internal factors, namely; debt to equity ratio (DER), growth, current asset (CR), and company size (size) to profitability (ROA) of coal companies Indonesia during 2015-2019. The study population was all coal companies listed on the IDX before 2015. By using a purposive sampling technique, 13 companies were obtained. The research variable data was estimated using the Panel data method. The results show that DER adversely affects ROA, and company growth is in line with the increase in ROA. HBA and CR variables do not affect ROA. The implication of the research results is to increase profitability, the company to increase sales through business diversification other than coal products, and reduce the total debt held so that it does not become a heavy payment burden.

Keywords: Coal Price, Profitability, Coal Mining Companies, Indonesia
JEL Classifications: G11, G30, G32, Q31

1. INTRODUCTION

The drop in coal prices in recent years has caused the net profit of coal mining companies in Indonesia to decline so that the profitability performance is not as expected by shareholders. The benchmark price for Indonesian coal (HBA) during the 2006-2012 period has reached the highest price of US $ 125 per metric ton. After that, world coal prices fell until now where the HBA fell to around the US $ 50 per metric. An interesting phenomenon in the last few years, the price of coal has experienced a drastic price decline and has an impact on the decline in net profit of coal mining companies in Indonesia so that the profitability performance is not as expected by shareholders. The highest reference price for Indonesian coal (HBA) reached more than the US $ 125 per metric ton during the period 2006-2012. After that, the world coal price decreased until 2020 where the HBA fell to around the US $ 50 per metric. The Covid-19 pandemic also suppressed the market and coal prices, where the realization of Indonesian coal production fell 11% in 2020 to 510 million tons. The price of coal is also determined by the shocks that occur between supply and demand in the oil market (Zamani, 2016). However, shocks from the supply side with excess capacity are the driving factors for the decline in coal prices (Wang et al., 2020). In addition, the availability of a new alternative energy source (Shale Gas) has shifted the position of coal. This condition not only affects economic growth, but also the survival of the coal mining company by decreasing profits that are not as expected.

The downward trend in HBAs also has an impact on company performance and in turn, has implications for the achievement of corporate profits. Financial performance is reflected in financial ratios that include; liquidity, leverage, and activity. The downward trend in

HBA causes the company's performance to decline and subsequently results in the achievement of company profits that are not as expected. Financial performance is reflected in financial ratios which include; liquidity, leverage, and activity. The development of liquidity as reflected in the current ratio (CR) for the last 5 years has decreased by about 1.93 times, which means that the company's short-term liabilities are a heavy burden in its payments. In the next few years, coal mining company cash needs are large enough to pay maturing company debts (Endri et al., 2020a). Total debt as measured by the debt to equity ratio (DER) shows an increasing trend and is higher than the other sub-sectors in mining companies and the implication is that the company's leverage is increasing. The activity ratio of coal mining companies is less efficient in using its total assets so that it has not been able to generate an optimal operating profit. This study aims to examine the factors that determine the profitability which is divided into two groups of factors, namely; (1) financial fundamental factors, namely; liquidity, level of debt, company size, and sales growth (2) certain industry factors, namely the price of coal.

2. LITERATURE REVIEW

Profitability is one of the company's performance assessments which is the main concern of shareholders so that the goal of maximizing wealth can be realized. Profitability is a measure to assess the effectiveness of managers in generating company profits (Endri et al., 2020b). This study uses Return on Assets (ROA) as an indicator of profitability. The amount of company ROA is influenced by certain factors and industries. Factor l is specifically related to financial fundamental factors, namely; debt to equity (DER), sales growth (growth), current ratio (CR), and company size (size). The external determining factor is the Indonesian reference coal price (HBA).

2.1. Current Ratio and ROA

Liquidity measures the company's ability, especially the availability of cash in paying obligations that are due. If it is unable to fulfill its obligations, the company will face financial difficulties. This condition can affect business operations and company profitability. The liquidity ratio that is widely used for liquidity management is the current ratio. A low current ratio usually indicates that there is a problem regarding a company's liquidity, while if the value of the CR is too high, it indicates that there are many unused funds, which in turn can decrease the ROA of the company. The impact of the CR on profitability, in the empirical literature review, still provides conflicting findings. The research conducted includes; Endri et al. (2020c), Pattitoni et al. (2014), and Asimakopoulos et al. (2009) which state that the CR has a negative effect on ROA. Different research results were suggested by Tailab (2014), Isik (2017), and Nanda and Panda (2018) which states that the higher the CR, the greater the ROA. Therefore, the research hypothesis proposed:

H_1: Current Ratio has an impact on profitability (ROA)

2.2. Leverage and Profitability

Companies have a choice between liabilities and equity to finance investment in company assets. Companies with large sources of debt financing certainly cause large fixed costs to pay for them and can have a negative impact on ROA. Many empirical studies use DER as a proxy for the level of company debt, which is the ratio between total debt and total equity. According to the Pecking Order Theory (POT), which states that companies with high ROA generally tend not to borrow, not because they have a low debt ratio target, but because they do not need external funds. On the other hand, companies with low ROA tend to have high levels of debt, due to limited internal funding and rely more on external funding. According to Pattitoni et al. (2014), companies with large debt have less return on equity. Several studies have proven empirically the negative effect of debt on ROA, including Endri et al. (2020c), Qayyum and Noreen (2019). Dalci (2018), Revathy et al. (2016), Isik (2017), Asimakopoulos et al. (2009), Nanda and Panda (2018), Rudin et al. (2016). Different findings are suggested by research by Kartikasari and Merianti (2016) who found that DER increased ROA, while the findings of Al-Jafari and Al Samman (2015) and Tailab (2014) state that DER does not affect ROA. Therefore, the research hypothesis proposed:

H_2: Leverage affects profitability

2.3. Sales Growth and Profitability

Sales growth is the change in sales from one period of time to the next, which is a source of increasing company revenue and profit. Therefore, it can be assumed that a high company growth rate can increase ROA. However, empirical studies prove inconsistent results of the impact of firm growth on ROA. Sales growth has a strategic influence on the company because it can expand market share resulting in increased sales and increased company ROA (Pagano and Schivardi, 2003). Many previous studies have proven that an increase in sales growth can increase ROA; Endri et al. (2020b), Fareed et al. (2016), and Khan et al. (2018). Different results revealed by Jang and Park (2011) using the lag model found that the increasing growth rate of this year and the previous year can reduce the ROA of the current year. This result implies that profit creates growth but growth hinders ROA. Tailab (2014) also proves that an increase in sales growth causes ROA to decrease. Therefore, the research hypothesis proposed:

H_3: Sales growth affects profitability (ROA)

2.4. Firm Size and ROA

Firm size is the total assets owned reflecting the company's capability in producing products according to customer needs. Firm size is a determining factor for firm profitability due to a concept known as economies of scale which is in line with traditional neo-classical views (Shaheen and Malik, 2012). This view implies that companies with large assets can produce at a low cost so that they can sell more products and generate greater profits. By this concept, firm size is expected to positively affect profitability. Some studies have tested this relationship but still provide conflicting empirical evidence. Research by Al-Jafari and Al Samman (2015), Tailab (2014), Pratheepan (2014), and Fareed et al., (2016), which states that the bigger the size causes the ROA to increase. However, it is a contradiction found by Kartikasari and Merianti (2016) which states that an increase in size causes the ROA to decrease. Therefore, the research hypothesis proposed:

H_4: Company size affects profitability (ROA)

2.5. Coal Price and Profitability

Reference Coal Prices (HBA) are obtained from an average of 4 commonly used coal price indices, namely: Indonesia New

Castle Global Coal Index, New Castle Export Index, Coal Index, and Platts Index. HBA is important for coal mining companies because it determines the amount of supply to the market that is a source of revenue and profit. The decline in coal prices has a negative impact on the decline in ROA. Azis et al. (2020) proved that coal prices can increase the profitability performance of coal mining companies. The increase in coal prices can increase the total profit which will have an impact on the increase in the equity market value of mining companies (Koerner et al., 1995). The profitability of a coal mining company is very elastic, the HBA has been regulated by the government based on world coal demand, this has an impact on the company's ability to manage its assets. Research by Sihotang and Munir (2021) found that reference coal prices have a negative but insignificant effect on ROA. Therefore, the research hypothesis proposed:

H_5: Coal price can determine profitability (ROA)

3. RESEARCH METHOD

3.1. Population and Sample

This research is causality research, which is research that is aimed to evaluate the hypothesis and find out the relationship and effect between two or more variables towards another variable. This research is aimed to evaluate the influence of independent variables which are Current Ratio, DER, Growth, Size, and coal price towards the dependent variable of ROA. The population in this research is coal mining companies are registered in IDX before 2015. The sample is taken by the purposive sampling method. In this method, every population data doesn't have the same opportunity to become a sample in the research, but only data that is fulfilling the requirement or specific criteria set by the researcher can take part in the research. The criteria sample that is set are; (1) Coal mining companies that are registered in Indonesia Stock Exchange before 2015 and isn't delisting until 2019; (2) The company has published financial reports for 5 years (2015-2089) and has data that is needed consequently from 2015-2019. 30 Doesn't have outlier data. If the company has outlier data, it will cause bias in the research. Based on the sample criteria above, 13 coal mining companies are obtained (list is attached) from 22 coal mining companies that are registered in IDX 2019.

3.2. Operational Definition and Variable Measurement

Table 1 shows the definitions and measurements of the research variables tested.

3.3. Panel Data Regression Model

The panel data regression model consisting of three models, namely: Fixed Effects Model (FEM), Random Effects Model (REM), and Common Effects Model (CEM) was applied to test the effect of CR, DER, growth, size, and coal price on profitability. To determine the model chosen for further analysis using paired testing, namely; the Hausman test, Chow test, and L-M test. The estimated panel data regression models are:

$$ROA_{it} = \alpha + \beta_1 CR_{it} + \beta_2 DER_{it} + \beta_3 Growth_{it} + \beta_4 Size_{it} + \beta_5 HBH_{it} + \varepsilon_{it}$$

Where:
ROA = Return on asset
HBH = Coal price
CR = Current ratio
DER = Debt to equity ratio
Growth = Sales growth
Size = Total assets

4. RESULTS AND DISCUSSION

4.1. Results

Table 2 is a descriptive statistic that describes the data characteristics of the estimated variables. The biggest standard deviation is experienced by the growth variable, which is at 27.24, meaning that the growth variable has a higher risk compared to other variables. Meanwhile, the price variable has the lowest risk, at 0.41. The dependent variable of ROA shows the mean of coal mining companies at 8.36 with a standard deviation of 9.11.

Table 3 shows the calculation results for each panel data regression model.

Chow-test is used to choose between CEM or FEM. This evaluation is done using the F-test statistic or Chi-squared test.

Table 1: Operational definition and variable measurement

Variable	Operational definition	Measurement
Profitability (ROA)	The ability of a company to obtain profit about the total asset, sales, or their capital	$ROA = \frac{\text{Profit after Tax}}{\text{Total Asset}}$
Current ratio (CR)	The ability of a company to pay their short term liabilities or debts which are due when invoiced in general	$\text{Current Ratio} = \frac{\text{Current Asset}}{\text{Current Debt}}$
DER	The percentage of provision of funds by shareholders to loaners	$DER = \frac{\text{Total Debt}}{\text{Equity}}$
Growth	The company's ability to increase its sales over time	$Growth = \frac{sales(t) - sales(t-1)}{sales(t-1)}$
Size	Amount of asset owned by a company (total assets)	LnSIZE=Ln Total Asset
HBA	The reference price of coal set by the ESDM Ministry	$HBH = \frac{price(t) - price(t-1)}{price(t-1)}$

Table 2: Data statistic description of research variable

Measurement	ROA	CR	DER	Size	Growth	Price
Mean	8.360156	2.053281	1.166406	19.54797	9.382969	0.092744
Median	6.2	1.83	0.75	19.745	6.24	−0.075229
Maximum	36.47	4.47	8.85	21.94	97.6	0.900392
Minimum	−10.15	0.8	0.04	15.6	−40.56	−0.194994
Std. Dev.	9.110231	0.835019	1.673346	1.489761	27.23614	0.416104
Skewness	0.756262	1.066048	3.546714	−1.058419	0.931134	1.386183
Kurtosis	3.73644	3.707362	15.52065	4.148527	4.185745	3.060571
Jarque-Bera	7.546863	13.45652	552.2225	15.46699	12.99743	20.50581
Probability	0.022973	0.001197	0	0.000438	0.001505	0.000035
Sum	535.05	131.41	74.65	1251.07	600.51	5.935629
Sum Sq. Dev.	5228.767	43.92721	176.4055	139.8214	46733.87	10.90797
Observations	64	64	64	64	64	64

Table 3: Analysis and evaluation of data panel regression

Variable	Probability		
	CEM	FEM	REM
CR	0.0016	0.3193	0.1628
DER	0.0234	0.3018	0.1362
SIZE	0.2938	0.0191	0.228
GROWTH	0.0169	0.0003	0
HBH	0.4214	0.89	0.8492
Chow test			
F test probability (0.000)		<5%	Fixed effect
Chi-square (0.000)		<5%	
Lagrange multiplier (LM)			
LM-test Breusch-Pagan (0.000)		<5%	Random effect
Hausman			
Cross-section probability (0.048)		<5%	Fixed effect

The conclusion of the test results in Table 3 shows that the chow-test results show that the F test probability value is smaller than $\alpha = 5\%$, therefore FEM is better used in estimating panel data regression compared to CEM. L-M test is used to determine which model is used in estimating the data panel regression model, which is between CEM or FEM. This evaluation is done using the F-test statistic or Chi-squared test. The results of the calculation of the LM-test BP show that the probability value of the B-P LM-test is 0.0000 smaller than $\alpha = 0.05$, which means that REM is more appropriately chosen to estimate the determinant of ROA. The Hausman test is used to choose between CEM or FEM. This evaluation is performed using the F-test statistic or the Chi-square test. The results of the calculation of the Hausman test obtained a probability value of 0.0480 random cross-section which is smaller than $\alpha = 0.05$, therefore FEM was chosen over REM in estimating the determinants of coal mining companies. Based on the paired evaluation using Chow test, LM Breusch-Pagan (BP) test, and Hausmant test towards the three methods of data panel regression above and compiled in Table 3, it can be concluded that FEM will be used in estimating and analyzing the effect of the internal factors of a company towards the debt level of mining companies in the coal sub-sector registered in the IDX during 2015-2019.

Based on the paired evaluation of the data panel regression model, FEM is the right model to estimate the profitability determinant of mining companies in the coal subsector registered in IDX during 2015-2019. The FEM applied in this research is the data panel regression model using white-heteroskedasticity, meanwhile, the autocorrelation problem isn't required in FEM, therefore the evaluation on autocorrelation can be disregarded. The estimated data panel regression using FEM with white-heteroskedasticity is shown in Table 4.

The result of evaluating the coefficient determinant showed that the coefficient determinant value (adjusted R2) is at 0.938007 meaning that 93.80% ROA is influenced by CR, DER, SIZE, GROWTH, and HBA.

4.2. Discussion

4.2.1. Effect of liquidity on profitability

Empirical findings conclude that liquidity (CR) does not affect profitability, meaning that changes in current assets and current debt are not related to profitability. This result support Azis et al. (2020), Harahap et al., (2020), Pratheepan (2014), and Khan et al. (2018) which states that the CR has a positive but insignificant effect on ROA. Research by Mayliza et al. (2020), and Fathony et al., (2020) proves that the higher the CR value will cause the ROA to increase. However, it is a contradiction with research done by Shahnia et al. (2020), and Asimakopoulos et al. (2009) which states that the CR has a negative effect on ROA.

4.2.2. Effect of leverage on profitability

The results found that DER had an inverse effect on ROA. With the increasing total debt of the company accompanied by a greater burden of liabilities, the consequence is a decrease in the company's ROA. These results are consistent with Asche et al. (2018), Al-Jafari and Al Samman (2015), Tailab (2014), Işık (2017), Asimakopoulos et al. (2009), and Nanda and Panda (2018) which states that the DER has an inverse effect towards ROA. However, it is contradictory with the research results of Kartikasari and Merianti (2016) which states that DER has a positive effect on ROA. Endri et al. (2021), Razak et al. (2020), and Mayliza et al. (2020) proved that DER does not affect ROA. The findings of Dalci (2018) provide two conclusions about the effect of leverage on ROA in the form of an inverted U, This means that an increase in financial leverage increases ROA which can be related to tax protection, while the opposite effect can be caused by bankruptcy costs, financial difficulties, information asymmetry, and agency problems.

4.2.3. Effect of growth on profitability

Increasing sales growth makes profitability performance better. With high growth, the company's ability to generate profits is

Table 4: Estimation of factors that influence profitability (rOA) FEM white cross-sections method

Variable	Coeff.	SE	t-Stat.	Prob.
C	−174.98	57.5159	−3.042342	0.0039
CR	0.887182	0.536722	1.652965	0.1051
DER	−0.616067	0.171095	−3.600737	0.0008
Size	9.292161	2.91495	3.18776	0.0026
Growth	0.063226	0.005618	11.2549	0
HBH	0.043039	0.127636	0.337204	0.7375
Weighted statistics				
R^2	0.938007	Mean d.v		10.38328
Adj R^2	0.915096	S.D. d.v		9.481471
S.E. of reg	3.336025	SSR		511.9369
F-stat	40.94212	D-W stat		2.065329
Prob(F-stat)	0			

even greater. Sales growth is determined by environmental and industrial conditions; trade-offs between strategic growth and short-term gains; profits vary over the product life cycle; and, growth is needed to build resources and scale that produces profitability. These results are consistent with research of Al-Jafari and Al Samman (2015), Fareed et al. (2016), Lea et al. (2020), Asimakopoulos et al. (2009), and Khan et al. (2018) which proves that growth has a positive effect on ROA. However, this contradicts the research of Tailab (2014) which revealed that high growth can reduce ROA.

4.2.4. Effect of FIRM SIZE on ROA

Ownership of larger assets can increase the profitability of coal mining companies in Indonesia. Companies with large assets have the advantage of economies of scale, where they produce efficiently and generate higher sales and profits. The empirical findings are the same as Lea et al., (2020), Al-Jafari and Al Samman (2015), Tailab (2014), Pratheepan (2014), Fareed et al. (2016), Khan et al. (2018), and Nanda and Panda (2018) which states that size has a positive influence towards ROA. Different results were revealed by Asche et al. (2018), and Kartikasari and Merianti (2016) which states that size has a negative effect on ROA. Endri and Fathony (2020 proves that the size of the company does not determine profitability.

4.2.5. The effect of coal prices (HBA) on ROA

The empirical findings show that HBA is not a determinant of ROA, which means that with the decline in the HBA trend, coal mining companies are less dependent on HBAs for profit, but are looking for other alternatives by diversifying their business. Several research sample companies have diversified their business, for example; PT Bukit Asam Tbk. (PTBA) which started to transform into a provider of steam energy. Furthermore, PT Adaro Energy Tbk (ADRO), has also developed new and renewable power plants. Then PT Harum Energy Tbk (HRUM) formed a Joint Venture in the field of Engineering, Productivity, and Construction (EPC) to develop steam power. The results of the study support the study of Sihotang and Munir (2021), and Anisa and Darmawan (2018) that HBA does not determine the ROA. The results of this study are different from Azis et al. (2020), Nababan (2019), and Sundari (2015) who concluded that coal prices positively and significantly affect profitability.

5. CONCLUSION

The interesting findings of the study concluded that the price of coal (HBA) and liquidity (CR) had no impact on the profitability of Indonesian coal companies. With the downward trend in world coal prices and uncertainty, the company has diversified its business to still be able to generate profits for shareholders. Leverage (DER) has the opposite effect on company profitability so that it must be balanced with an increase in sales growth (Growth) so that the company's liability burden can be met. In addition, companies can increase the efficiency of using assets (Size) to achieve economies of scale in production activities so that they can generate greater profits. Research results have an impact on both investors and companies. For investors, it is better to observe the DER value, growth, and size of the company. This is because the level of DER, growth, and size of a company has a influence on its profitability. For companies, it is better to observe the Debt to Equity Ratio. A company shouldn't have debts in big amounts or exceeding the company's equity. A company can reduce the amount and use of debt by optimizing the use of its capital or retained earnings. A company that can manage its level of DER below the optimum limit, will influence the investor to invest as there is a relatively low risk. Companies must pay attention to, utilize, and process their assets and resources to increase the opportunities for investors to invest in the company so that they provide a positive impact on profitability.

For further research, a broader object can be used, not only coal companies, but also other companies in a different sub-sector, or also in a different industry, so that the result is better than this research and increases the liquidity variable other than the current ratio (CR) and working capital turnover variable that has a potential contribution towards profitability.

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