

*Research Article*

## **Financial Performance and Capital Structure on Firm Value with Commodity Prices as a Moderating Variable**

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### **Abstract**

This study aims to examine the impact of liquidity, profitability, and capital structure on firm value, with commodity prices as a moderating variable. Causal research was employed, and 23 firms were selected as samples using purposive sampling at the IDX. Secondary data from these firms were used for analysis, and panel data analysis with e-views was applied. The findings reveal that liquidity and profitability do not significantly influence firm value, while capital structure significantly affects firm value. Commodity prices moderate the relationship between profitability and firm value but not for liquidity and capital structure. The study's implications suggest that coal mining firms need to carefully consider decisions that affect their value, particularly regarding investment funding through the management of capital structure, profitability, and liquidity. Investors must make informed decisions based on firm value and performance, considering financial reports and stock price developments at IDX.

**Keywords:** Liquidity, Profitability, Capital Structure, Coal Price Reference, Firm Value

**JEL Classification:** G30, G31, G32

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## **1. Introduction**

The development of the capital market in Indonesia shows quite rapid competition. It is indicated by the growth in the number of public firms listed on the Indonesia Stock Exchange (IDX) until April 2021, reaching 803 firms. This competition is a challenge for registered firms to provide financial reports as fair and reliable information for all users of these financial statements, especially in firms engaged in the mining sector. (Turahma & Tanjung, 2022).

The mining sector is one of the businesses providing energy resources to support the economic development of a country. It is one of the drivers of the capital market on the Exchange. Mining sub-sector firms are included in the Mineral and Coal sub-sector.

One of the current problems for the industry and mining firms is a government policy contained in the Minister of Energy and Mineral Resources Decree Number 139.K/HK.02/MEM.B/2021 regarding Domestic Market Obligation (DMO) obligations. Under this regulation, mining firms that do not comply with the 25% DMO from production plans or domestic sales contracts will be subject to a ban on coal exports, fines, or compensation funds. In fact, of the 634 coal firms that have obligations to supply coal domestically, only 15% of firms fulfill the DMO of 100% (Press Release, Ministry of Energy and Mineral Resources, 2021).

This study focused on the mining sector as the research subject due to the significant presence of coal firms in Indonesia that have entered the capital market to attract investments and bolster their financial standing. In addition, according to [Aggraini \(2022\)](#), the mining sector is a sector that can increase investor interest because of its long-term nature. In the energy sector index (IDX energy), coal mining stocks have strengthened by 26.58% since the beginning of the year.

Supply and demand factors, including the covid pandemic, tensions between countries, and Ukraine vs. Russia war, caused the fluctuations in coal prices in recent years from 2016 - 2021. The decline in coal firm revenues was due to the weakening of coal prices, especially those with high calorific value, which decreased the average selling price.

The primary objective of a firm is to maximize profits and increase its value, ultimately benefiting the investors. Investors consider the firm value a crucial aspect in their investment decisions, as it represents the selling price of the operating firm and serves as a benchmark for achieving firm goals ([Anggraini, 2022](#)). One way to proxy firm value is by using the price-to-book value (PBV) ratio, which reflects how the market values the firm's shares compared to their book value. Several financial ratios, including Liquidity, Profitability, and Capital Structure, can influence the firm's value, as indicated by the market ratio.

Liquidity pertains to a firm's capacity to settle its short-term debts by converting non-cash assets into cash. This ability can be evaluated using the current ratio, which is determined by dividing current assets by current liabilities. A greater current ratio signifies that the firm has more funds accessible to cover dividends, operational expenses, and investments. As a result, investors perceive the firm's performance positively and are more likely to choose it, increasing the firm's overall value. Previous studies by [Daeli and Endri \(2018\)](#) and [Ningsih \(2019\)](#) have also demonstrated that liquidity significantly influences firm value.

Profitability is another factor that can impact the firm's value. It reflects the firm's effectiveness in generating profits and influences investors' perception of its future prospects with efficient asset management. Return on equity is commonly used to measure profitability, representing the return on investment made by the firm using all its assets. Investors consider the firm's high profitability when evaluating its stock price, thereby enhancing its overall value. Findings from research by [Ningsih \(2019\)](#) and [Anggraini \(2022\)](#) confirm that profitability significantly influences the firm's value.

In the mining sector, which involves quarrying activities, substantial capital is necessary to attain firm objectives. Consequently, managing capital utilization, both long-term and short-term debt, becomes crucial. Capital structure is assessed using the Debt to Asset Ratio (DAR), which quantifies the total assets financed by creditors compared to firm owners. This ratio determines how much the firm's assets are utilized as collateral for liabilities. The ideal DAR calculation is 100% that total liabilities cannot be greater than the firm's assets ([Kasmir, 2017](#)). [Hirdinis research results \(2019\)](#), [Alamsyah & Muchlas \(2018\)](#), and [Aggraini \(2022\)](#) concluded that capital structure affects firm value.

The novelty of this research lies in including a moderating variable called coal reference price (HBA). Moderating variables can enhance or weaken the impact of the independent variable on the dependent variable. In addition, the observation period carried out was 2016-2021; the researcher wanted to prove whether the results of previous research were situational, considering the year of the researcher's observation period where there was a Covid-19 phenomenon that did not occur in previous studies.

## 2. Literature Review and Hypothesis

### Signaling Theory

According to [Brigham & Houston \(2013\)](#), the signal theory is an effort or action that a firm decides to provide information as a guide for investors regarding the firm's performance and prospects. Information provided by the firm as a guide for external parties (creditors, investors, and other parties) is generally a financial report. The financial statements presented by the firm are expected to be a signal and able to reduce information asymmetry to external parties. Because financial reports can provide credible, relevant, accurate, timely information and information related to the prospects for the firm's future sustainability ([Bergh et al., 2014](#)).

### Agency Theory

When analyzing an issuer, investors use agency theory, which is also related to overall economic conditions. This theory relates to the party that gives authority to investors. There are several problems with this agency theory, namely the investors' control over managers that usually acfirms agency and management relationships. This problem is because agents and principals act in the firm's best interest, so the problem is theoretical. Agency relationship theory can motivate investors to have harmonious relationships and maintain normal interests. This relationship can be characterized as a good relationship in achieving a goal and the interests of each party ([Brigham & Houston, 2013](#)).

### firm value

firm value is an impression of financial support about the level of progress of firm management in overseeing firm assets that are distributed to firms, often at firm expense ([Indrarini, 2019](#)). firm value is important for measuring prospects that can manage financially healthy firms and firm growth ([Santosa et al., 2020](#)). The main reason for the firm, as shown by the firm hypothesis, is to expand the abundance or value of the firm ([Wiyono & Kusuma, 2017](#)). The primary objective of increasing the firm's value is to foster investor growth, which serves as a crucial benchmark for the firm. A higher firm value attracts more attention from investors and instills confidence among financial backers, making them more inclined to manage investor funds.

### Hypothesis

#### Liquidity

Liquidity assesses a firm's capacity to settle short-term and long-term liabilities upon maturity. A higher level of liquidity indicates the firm's capability to pay off short-term obligations during favorable conditions, which contributes positively to the proportion of debt. In this situation, when a firm's liquidity is high, financial management will receive a positive signal to increase the firm's value ([Santosa, 2020](#); [Dewi & Sujana, 2019](#)). This opinion follows research conducted by; [Farooq & Masood \(2016\)](#), which states that liquidity affects the firm's value.

**H1: There is an effect of liquidity on firm value.**

#### Profitability

Profitability is a capability that can be used to measure a firm's ability to generate profits in a certain period. According to an investor's perspective, profitability is a useful indicator for measuring the possibility of a firm in the future, and this is important to see to find out how much profit investors get from their investment. Signal theory suggests that a high level of profitability with the possibility of a large firm triggers financial backers to put resources into the firm. The increased interest for stock investors leads to the development of expanded profitability over time is seen as a positive sign by financial supporters associated with better firm execution. good and guaranteed business

operational possibilities from now on.

**H2: There is a profitability effect on firm value.**

### **Capital Structure**

Increasing liabilities to a certain level can enhance the firm's performance presentation, especially when accompanied by capital expansion and higher profits. This condition attracts investor interest, increasing the firm's stock price, thereby indicating a rise in the firm's value. Previous research by [Hirdinis \(2019\)](#) and [Albart et al. \(2020\)](#) examined the relationship between capital structure and firm value, demonstrating that capital structure influences firm value. In addition, [Alamsyah & Muchlas's \(2018\)](#) research also has a positive effect that capital structure affects firm value.

**H3: There is an influence of capital structure on firm value.**

### **New Price Reference coal**

A price is a unit of value given to a commodity as information provided by producers or owners to consumers ([Peranginangin & Wahyuni, 2019](#)). One of the commodities in question is the reference coal price, which is traded both nationally and internationally, so the price fixing will affect the value of a firm. Rising world coal prices bring advantages to coal-producing firms in terms of energy. Alongside increased firm profits, the share value of mining firms becomes an attractive target for investors. So that this will also provide a large share movement and capitalization value ([Amanda et al., 2018](#)). The results of previous research concluded that coal prices significantly influence firm value ([Peranginangin & Wahyuni, 2019](#); [Amanda et al., 2018](#)). Several other findings supporting this result ([Daddikar & Rajgopal, 2016](#)) also found that the reference coal price affects firm value.

**H4: There is an influence of Reference Coal Prices on firm value**

An increase or decrease in the reference coal price (HBA) will certainly impact the firm's finances, especially coal mining firms as producers. The amount of coal production that increases when prices decrease will determine the amount of demand and supply. When the reference coal price decreases, it will cause losses. Furthermore, vice versa, when the reference coal price increases, the firm will have a profit. So that the firm can fulfill obligations in the form of due or short-term debt, the firm's ability to make investors feel confident and trusted that the firm's value will also increase ([Peranginangin & Wahyuni, 2019](#)). Thus, it is indicated that the reference coal price can moderate the effect of liquidity on firm value. Previous studies concluded that coal prices significantly affect firm value ([Peranginangin & Wahyuni, 2019](#); [Amanda et al., 2018](#)). The other findings by [Dewi and Sujana \(2019\)](#); [Farooq and Masood \(2016\)](#) state that liquidity affects firm value.

**H5: Reference coal prices are moderating the effect of liquidity on firm value**

According to [Amanda et al. \(2018\)](#), an increase in coal prices will benefit the firm and increase firm profits. The reference coal price determines the profitability of a firm. When the reference coal price decreases, it will cause losses. Moreover, vice versa, when the reference coal price increases, the firm will have a profit or gain or be in a profit state. Profitability has increased, providing a positive signal (good news) to investors and increasing firm value ([Amanda et al., 2018](#)). is under the Signaling theory, and investors will trust and be interested in trading stocks when there is a positive signal. The research results of Germaine and Jan (2017) concluded that commodity prices have a relationship with profitability. Meanwhile, [Amanda et al. \(2018\)](#) found that profitability affects firm value.

**H6: Reference Coal Price is a moderating effect of profitability on firm value**

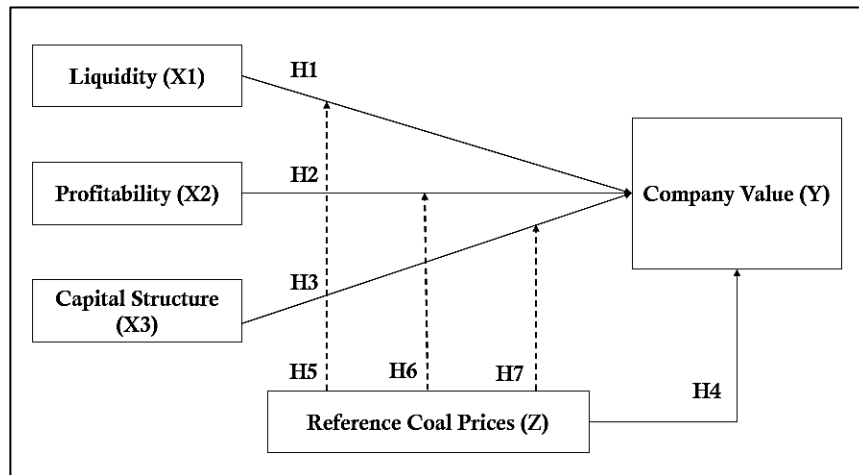
The mining sector is a quarrying business that requires large capital. So the management of capital structure becomes important. Because the amount of coal production increases when prices decrease will determine the amount of demand and supply ([Peranginangin & Wahyuni, 2019](#)). Bearing in mind that increases and decreases in commodity prices can determine profits and losses, the capital structure must be considered. According to the trade-off theory, additional debt remains acceptable as long as the advantages outweigh the disadvantages. Modigliani and Miller, as cited in [Jonathan & Militina \(2019\)](#), suggest that the higher the proportion of debt, the more valuable a

firm becomes. Amanda et al. (2018) state that a capital structure that will increase firm value is good. It Hirdinis (2019) states that capital structure affects firm value. Thus, it is indicated that the reference coal price can moderate the influence of the capital structure on firm value.

**H7: Reference coal prices are moderating the effect of capital structure on firm value**

### 3. Data and Method

This study employs a quantitative methodology. The population includes all coal mining firms listed on the Indonesia Stock Exchange, totaling 23 firms. Purposive sampling is used to retrieve data. The research utilizes secondary data available at [www.idx.co.id](http://www.idx.co.id), which comprises cross-sectional and time series data. The analysis is conducted using the e-views program with panel data.



**Figure 1. Research Model**

### 4. Results

#### Data Description

The research variables are described by their maximum value, minimum value, average value (mean), and standard deviation. These data are obtained from the annual reports of coal mining firms that served as samples for the research, covering the period from 2016 to 2021.

**Table 1. Descriptive statistics**

	CH	NWC	DAR	CFL	FS
Mean	1.621377	0.011667	3.174638	0.069928	0.222246
Maximum	13.28000	0.420000	118.2200	1.240000	1.710000
Minimum	-2.970000	-0.230000	0.180000	-5.730000	0.000000
Std.Dev	1.949949	0.213489	10.70772	0.589595	0.244558
Observations	138	138	138	138	138
Cross sections	23	23	23	23	23

Table 1 provides the characteristics of each variable used in this study. The dependent variable, firm value, represented by Price to Book Volume (PBV), has a min value of -2.970000, a max value of 13.28000, and a mean value of 1.621377, based on 138 observations. The moderating variable, Coal Reference Commodity Price (HBA), has a minimum value of -0.230000, a maximum value of 0.420000, and a mean value of 0.011667, also based on 138 observations.

#### Chow Test

Chow test is conducted to decide between using the fixed effect or common effect model for estimating panel data. This test aims to determine the better model among the two, i.e., fixed effect (FE) or common effect (CE).



**Table 2. Results of the Chow test**

Dependent	Independent	Chi-Square	Prob.	Decision
PBV	CR, ROE, and DAR	164.555103	0.0000	H1 Accepted

According to the outcomes of the Chow test presented in Table 2, the probability value for the research model is 0.0000. As the probability value is 0.0000, less than 0.05, the fixed effect model (FEM) is determined to be superior to the common effect (CE) model.

#### Hausman Test

The subsequent step is to conduct the Hausman test after selecting the fixed effect model as the better model based on the Chow test. This test reevaluates the best model between the fixed effect (FE) and the random effect (RE).

**Table 3. Results of the Hausman test**

Dependent	Independent	Chi-Square	Prob.	Decision
PBV	CR, ROE, and DAR	8.388872	0.0783	H1 Rejected

According to the outcomes of the Hausman test presented in Table 3, the probability value for the research model is 1.0000. Since the probability value is greater than 0.05, the Random Effect Model (REM) is the estimation model.

#### Hypothesis Test

##### Determination Coefficient Test ( $R^2$ )

The statistical values of the coefficient of determination in Table 4 are as follows:

**Table 4. Test Results for the Coefficient of Determination**

Dependent	Independent	$R^2$	Adjusted R2
PBV	CR, ROE, DAR, and HBA	0.473368	0.390319

Based on the data in the table, the R-squared value is 0.473368 or 47.33%. This indicates that 47.33% of the firm Value (PBV) can be explained by the variables Current Ratio (CR), Return on Equity (ROE), and Debt to Asset Ratio (DAR). The remaining 52.67% (100% - 47.33%) is influenced by other variables not considered in this study.

#### F test

The F test is employed to analyze the collective or simultaneous impact of liquidity (CR), profitability (ROE), and capital structure (DAR) on firm value (PBV), with the reference coal price (HBA) serving as the moderating variable. This test assesses the combined influence of the independent variables on the dependent variable.

**Table 5. F-test Test Results (Simultaneous)**

Dependent	Independent	F-test	Prob
PBV	CR, ROE, DAR, and HBA	2.401803	0.005328

Based on the data in Table 5, the F statistic for firm value (PBV) is 2.401803, and its corresponding probability value is 0.005328, less than 0.05. It implies that the variables CR, ROE, DAR, and HBA, when considered together, can collectively explain or influence the variation in the firm's value.

**Statistical Test t (REM)**

The statistical test primarily indicates the extent to which an individual or specific independent variable can explain the variation in the dependent variable.

**Table 6. t-test results**

Variable	Coefficient	t-Statistic	Prob.	Decision
C	1.821375	5.431821	0.0000	
CR → PBV	0.000793	0.076677	0.9390	H1. rejected
ROE → PBV	0.354816	1.959717	0.0521	H2. rejected
DAR → PBV	-0.976194	-1.465114	0.0452	H3. accepted
HBA → PBV	-0.888943	-2.007443	0.0467	H4. accepted
MOD1 → PBV	0.091639	0.974653	0.3315	H5. rejected
MOD2 → PBV	-0.040427	-2.212665	0.0287	H6. accepted
MOD3 → PBV	0.297172	0.168945	0.8661	H7. rejected

Note: Mod1 (HBA\*CR); Mod2 (HBA\*ROE); Mod3 (HBA\*DAR)

**5. Discussion****The Effect of Liquidity on Firm Value**

Based on the findings from testing the first hypothesis, it is concluded that H1 is not supported, indicating no significant impact of the current ratio on firm value. This influence is absent because the firm experiences an imbalance between current assets and liabilities. The firm's current debt can be higher than the current ratio during the study period due to the Covid-19 pandemic. The firm is reduced, and the value of the firm decreases. The results of this research support the research results of [Anggraeni \(2019\)](#); [Lumentut & Mangantar \(2019\)](#); [Tandau & Suryadi \(2020\)](#); [Anggraini \(2022\)](#), concluded that the liquidity ratio proxied by the Current ratio does not affect firm value.

**Effect of Profitability on Firm Value**

Based on the outcomes of testing the second hypothesis, it is concluded that H2 is not supported, indicating no significant influence of Return on Equity on firm value. This influence is absent because the firm in the study period has experienced difficult conditions. During a pandemic, the firm's ability to obtain profits or profits will certainly decrease and even suffer losses; for example, some firms are still profitable, but these profits will be more focused on the firm's survival and resources ([Munawir, 2017](#)). This supports the signaling theory that when a firm cannot manage funds to earn profits, it will become bad news, reducing investor confidence and ultimately making it less valuable ([Santosa et al., 2020](#); [Turahma et al., 2022](#)). The results of this research support the results of [Lumentut & Mangantar's research \(2019\)](#), [Fitria & Kuntari \(2019\)](#), and [Tandanu & Suryadi \(2020\)](#), who concluded that ROE does not affect firm value.

**Effect of Capital Structure on Firm Value**

The results of the third hypothesis test indicate that H3 is supported, revealing a significant negative impact of Debt to Asset Ratio (DAR) on firm value. This effect is proportionally strong, indicating that as the DAR increases, the firm's value tends to decrease. This negative effect indicates that the level of debt to the coal mining firms that are the sample of this study is relatively high; this can cause investor sentiment toward firm value to fall because the risk is too great from an investor's point of view ([Hermansyah & Sihombing, 2022](#)). The results of this study present that capital structure affects firm value, in-line with the results of [Hirdinis \(2019\)](#), [Alamsyah \(2018\)](#), [Nur \(2018\)](#), and [Aggraini \(2022\)](#).

**The Effect of Reference Coal Prices on Firm Value**

The findings from testing the fourth hypothesis indicate that H4 was supported, revealing an influence of the Reference Coal Price (HBA) on firm value. An increase in world coal prices is advantageous for coal-producing firms in terms of energy. Additionally, higher profits from such

price increases make the mining firm's shares more attractive to investors. So that this will also provide a large share movement and capitalization value (Amanda et al., 2018). The results of previous research concluded that coal prices significantly influence firm value (Peranginangin & Wahyuni, 2019; Amanda et al., 2018). Several other findings supporting this result are that Daddikar & Rajgopal (2016) also found that the reference coal price affects firm value.

#### **The Role of Reference Coal Prices in Moderating the Effect of Liquidity on Firm Value**

The test results indicate that H5 is unsupported, implying that the Reference Coal Price (HBA) does not moderate the relationship between the current ratio and firm value. This is attributed to the coal mining firms included in the sample of this study experiencing an imbalance between their current assets and current liabilities. This imbalance is not caused by an increase or decrease in the Reference Coal Price (HBA) but by other factors, such as; debt policy made by management in its capital structure. As a result, during the pandemic, firms felt that they had high levels of debt and could not convert non-cash assets into cash (Anggraini, 2022), reducing investor confidence in the firm and decreasing firm value. Thus, the results of this study are not able to prove the hypothesis proposed and do not support the research results Peranginangin & Wahyuni, 2019; Amanda et al., 2018 and Dewi & Sujana (2019); Farooq and Masood (2016).

#### **The Role of Benchmark Coal Prices in Influence Moderation Profitability to firm value**

The results of testing the sixth hypothesis stated that H6 was accepted, which means that the Reference Coal Price (HBA) proved to be moderating and weakened the effect of Return on Equity on firm value. According to Amanda et al. (2018), an increase in coal prices will benefit the firm and increase firm profits. The reference coal price determines the profitability of a firm. When the reference coal price decreases, it will cause losses. Moreover, vice versa, when the reference coal price increases, the firm will profit or gain or be in a profit state. Profitability has increased, providing investors with a positive signal (good news), thereby increasing firm value (Amanda et al., 2018). Consistent with the Signaling theory, investors tend to trust and show interest in trading stocks when they receive positive signals. The findings of this study suggest that the reference coal price acts as a moderating variable only for the profitability variable, specifically the Return on Equity (ROE) indicator, in influencing firm value.

#### **The Role of Reference Barbara Prices to Moderate the Effect of Capital Structure on Firm Value**

The findings from testing the sixth hypothesis indicate that H7 is rejected, indicating that the Reference Coal Price (HBA) does not significantly affect the relationship between Capital Structure (DAR) and firm value. This is because, remembering that increases and decreases in commodity prices can determine profits and losses, capital structure management must be considered (Peranginangin & Wahyuni, 2019). According to the trade-off theory, a firm can continue to take on additional debt if the advantages outweigh the costs. Modigliani and Miller, as cited in Jonathan & Militina (2019), suggest that the higher the debt proportion, the more valuable the firm becomes. However, when the level of debt to a firm is high, this can cause investor sentiment toward the firm's value to fall because the risk is too great from an investor's point of view (Hermansyah & Sihombing, 2022). Amanda et al. (2018) state that a capital structure that will increase firm value is good. Therefore, the findings of this research do not support the hypothesis that the reference coal price can moderate the impact of capital structure on firm value.

## **6. Conclusion**

Based on the research findings and discussions, the conclusions drawn from this study are as follows: Liquidity, represented by Current Assets, and Profitability, represented by Return on Equity, do not have a significant impact on firm value. However, the capital structure, represented by the Debt to Asset Ratio, and the Reference Coal Price (HBA), significantly affects firm value. The Reference Coal Price (HBA) acts as a moderator, influencing the relationship between profitability (Return on Equity) and firm value but not affecting the relationships between liquidity (Current Assets) and firm value, as well as capital structure (Debt to Asset Ratio) and firm value. These findings have implications for management, particularly in coal mining firms, when making decisions that can influence the firm's value. Investors are advised to exercise caution and consider



factors such as firm value and performance, as reflected in financial reports and stock price developments on IDX, before making investment decisions.

## Recommendations

This research is limited to coal mining firms listed on the IDX with a research period of 2016-2021. So that for further research it is expected to use a different sample of firms outside the mining sector, for example, from the manufacturing or service sectors, so that the effect on firms in the mining sector can be known differently. The factors that predict firm value are limited to liquidity, profitability, and capital structure. So that for further research, it is expected to be able to use or add other independent variables to make it more comprehensive.

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