

The Effect of Risk, PBV, Fed Rate, and Oil Prices on Stock Prices Moderated by Firm Size in Mining Companies Listed on the Indonesia Stock Exchange

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ARTICLE HISTORY

Received: 22 September 26

Final Revision: 06 October 26

Accepted: 15 October 26

Online Publication: 31 December 26

KEYWORDS

Risk, Price Book Value, Fed Rate, Oil Prices, Stock Prices

ABSTRACT

This study aims to analyze the effect of risk, Price Book Value (PBV), Fed Rate, and oil prices on stock prices, with firm size as a moderating variable, and inflation, liquidity, and solvency as control variables. This study uses a panel data regression approach with the help of EViews 12 software. Research data were obtained from 30 mining sector companies listed on the Indonesia Stock Exchange during the period 2014–2022. The novelty of this study lies in the use of inflation, liquidity, and solvency as control variables in examining the determinants of stock prices. The results show that risk, PBV, Fed Rate, and oil prices influence stock prices, considering the moderating role of firm size. This study confirms that stock price movements are influenced by internal and external factors of the company. The findings provide empirical evidence regarding the importance of financial indicators and macroeconomic conditions in explaining stock price fluctuations. This research contributes to financial literature by providing additional evidence about the relationship between company characteristics, economic conditions, and stock performance in the mining sector. Therefore, investors and researchers can consider various financial and economic factors when analyzing stock market performance and investment decisions. In addition, this study highlights the importance of considering both company-specific characteristics and macroeconomic conditions when evaluating stock price movements in emerging markets. The findings may serve as a reference for future studies examining the interaction between financial indicators, external economic factors, and firm characteristics in determining stock market performance.

KATA KUNCI

Risiko, *Price Book Value*, *Fed Rate*, Harga Minyak, Harga Saham

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DOI

10.37034/jems.v9i1.576

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh risiko, *Price Book Value* (PBV), suku bunga *The Fed* (*Fed Rate*), dan harga minyak terhadap harga saham, dengan ukuran perusahaan sebagai variabel moderasi, serta inflasi, likuiditas, dan solvabilitas sebagai variabel kontrol. Penelitian ini menggunakan pendekatan regresi data panel dengan bantuan perangkat lunak EViews 12. Data penelitian diperoleh dari 30 perusahaan sektor pertambangan yang terdaftar di Bursa Efek Indonesia selama periode 2014–2022. Kebaruan penelitian ini terletak pada penggunaan inflasi, likuiditas, dan solvabilitas sebagai variabel kontrol dalam mengkaji faktor-faktor penentu harga saham. Hasil penelitian menunjukkan bahwa risiko, PBV, *Fed Rate*, dan harga minyak memengaruhi harga saham, dengan mempertimbangkan peran moderasi ukuran perusahaan. Penelitian ini mengonfirmasi bahwa pergerakan harga saham dipengaruhi oleh faktor internal dan eksternal perusahaan. Temuan ini memberikan bukti empiris mengenai pentingnya indikator keuangan dan kondisi makroekonomi dalam menjelaskan fluktuasi harga saham. Penelitian ini berkontribusi pada literatur keuangan dengan menyajikan bukti tambahan mengenai hubungan antara karakteristik perusahaan, kondisi ekonomi, dan kinerja saham di sektor pertambangan. Oleh karena itu, investor dan peneliti dapat mempertimbangkan berbagai faktor keuangan dan ekonomi saat menganalisis kinerja pasar saham dan keputusan investasi. Selain itu, studi ini menyoroti pentingnya mempertimbangkan karakteristik spesifik perusahaan maupun kondisi makroekonomi dalam mengevaluasi pergerakan harga saham di pasar negara berkembang. Temuan ini dapat menjadi referensi bagi penelitian selanjutnya yang mengkaji interaksi antara indikator keuangan, faktor ekonomi eksternal, dan karakteristik perusahaan dalam menentukan kinerja pasar saham.

1. Introduction

Stock price serves as an indicator of successful corporate management; a consistently rising stock price leads investors and prospective investors to perceive the company as successful in managing its operations. Investor confidence is highly beneficial for the issuing company, as greater public confidence strengthens the willingness of investors to commit capital to the firm. Stock prices are influenced by both external and internal factors. External factors lie beyond the company's control—such as a country's political, economic, and social conditions—whereas internal factors relate to managerial objectives regarding decision-making aimed at maximizing the stock price, thereby maximizing shareholder wealth [1].

Stock prices can be evaluated or analyzed using two approaches: technical and fundamental [2]. It is stated that fundamental analysis evaluates a stock by analyzing a company's financial statements [3]. Financial statement analysis provides much of the data

needed to forecast earnings, dividends, and selling prices. Based on the foregoing, stock fundamental analysis can be conducted by examining a company's financial statements; this analysis focuses on the financial statements as they relate to the company's financial performance.

Throughout 2019, the mining sector—a component of the Jakarta Composite Index (JCI)—contracted by 12.83%, and the performance of state-owned mining enterprises (BUMN) declined in the first quarter of 2020. Among the listed companies that have released their financial reports are PT Timah Tbk (TINS) and PT Bukit Asam Tbk (PTBA). PT Bukit Asam Tbk (PTBA) also faced headwinds in the first quarter of 2020, with the company recording a decline in both revenue and net profit compared to the same period the previous year. Meanwhile, TINS reported a net loss of Rp 412.86 billion, contrasting with the same period the prior year, when it had posted a net profit of Rp 301.27 billion.

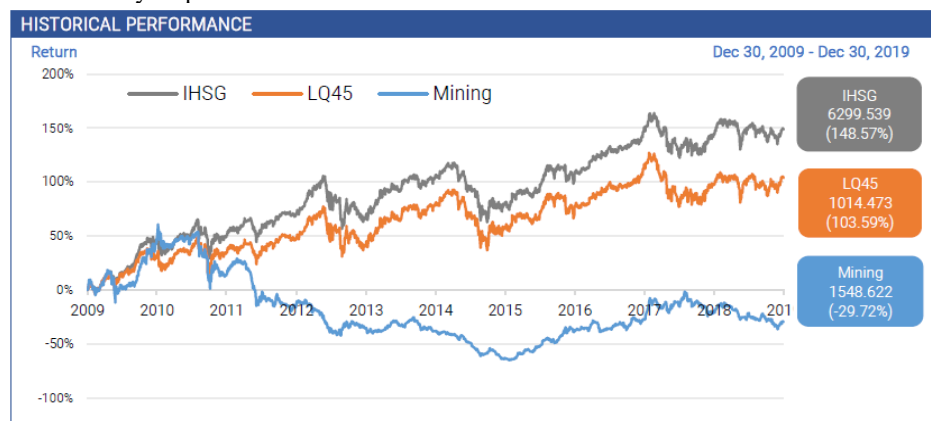


Figure 1. Performance of the Mining Industry Stock Price Index, the JCI, and the LQ-45 Index

Based on Figure 1, the mining sector stock index experienced a different movement compared with the Jakarta Composite Index (JCI) and the LQ-45 Index during the observed period. The decline in mining sector performance indicates that several internal and external factors may influence stock price movements. Therefore, further analysis is required to identify the factors affecting mining stock prices, including financial conditions and macroeconomic variables. Consequently, it is necessary to examine the factors contributing to the decline in mining stock performance. One factor influencing stock prices is risk—defined as uncertainty arising in various contexts, including investment. Investment-related risks can materialize at any time; generally, the pursuit of high returns entails high risk, whereas lower returns are associated with lower risk.

Maximizing corporate value means maximizing market value through the share price, which reflects the impact of all financial decisions made by the company. Corporate value represents investors' perception of the

company's success, instilling confidence in the market and investors regarding its prospects [1]. One factor influencing stock prices is firm value. Investors often assess firm value by evaluating the company's standing via the Price-to-Book Value (PBV) ratio; this ratio reflects the relationship between the stock's market price and its book value per share, and is also known as the market-to-book ratio [1]. Furthermore, financial statements provide information regarding a company's status that can serve as a basis for decision-making. These statements require analysis to evaluate the performance achieved by company management in the past and to inform the formulation of future corporate plans [4], [5].

Another factor influencing stock prices is liquidity; a company's liquidity status affects its financial position, which in turn impacts its profitability. Consequently, investors are more attracted to companies with sound financial health or those that are liquid [6]. One frequently used liquidity ratio is the Current Ratio; a higher Current Ratio is considered better, as it indicates

a greater ability on the part of the company to meet its obligations promptly.

Firm size is also a significant factor in investment considerations, as companies with substantial assets are deemed to have reached a stage of maturity; such large firms generally offer greater business stability, thereby allowing for more accurate predictions regarding future earnings. A study notes that firm size is typically proxied by total assets; given that the value of total assets is usually very large, this approach aims to reduce the likelihood of heteroscedasticity [7]. A study also states that one of the benchmarks indicating the size of a company is the magnitude of its assets [8].

Research notes that large companies are assumed to have reached the maturity phase; consequently, they are expected to exhibit stable operational activities, generate higher profits, and remain resilient against bankruptcy [9]. Argue that when faced with a choice between two equally profitable stocks, analysts consider additional factors before issuing a recommendation [10]. It is precisely these other factors that lead researchers to hypothesize that aspects beyond earnings can influence stock returns. One such factor is firm size; firm size influences an analyst's decision when comparing two stocks with comparable profitability.

2. Research Method

The research design aims to explain the influence of financial performance and external corporate factors on PBV and their subsequent impact on stock prices, with firm size serving as a moderating variable. This study is classified as descriptive-explanatory research; it seeks not only to provide an overview of how financial performance and external factors affect PBV and stock prices—as moderated by firm size—but also to examine the relationships or influences between variables, specifically cause-and-effect connections, through hypothesis testing.

The data used in this study are secondary panel data. Secondary data are obtained from existing sources, including annual reports, financial statements, and published databases. Panel data combine cross-sectional data and time-series data, allowing researchers to analyze observations across companies and periods simultaneously [11], [12]. The data in this study were obtained from mining sector companies listed on the Indonesia Stock Exchange during the period 2014–2022.

3. Result and Discussion

3.1. Test Result

Based on the partial hypothesis testing results (t-test) using the random effects model following the moderation analysis, the researcher formulated the panel data regression equation on Equation (1).

$$HS = 3.476815 + 0.129333Risk + 0.095230PBV - 42.84654FR - 0.012948OP + 0.145559FS + 0.376588CR - 0.113189DER - 4.495213INF + (Risk \times 6.73E-12FS) + (PBV \times -4.35E-10FS) + (FR \times 2.85E-08FS) + (OP \times -3.39E-11FS) + \varepsilon \quad (1)$$

The moderating variables are classified into four types: pure moderation, quasi-moderation, homologizer moderation (potential moderation), and predictor moderation (moderation as a predictor). Briefly, these four classifications of moderating variables are presented in the following Table 1.

Table 1. Classification of Moderating Variables

No	Moderation Type	Coefficient
1	<i>Pure Moderasi</i>	b2 non-significant b3 significant
2	<i>Quasi Moderator</i>	b2 significant b3 significant
3	<i>Homologiser Moderasi</i>	b2 non-significant b3 non-significant
4	<i>Predictor Moderasi</i>	b2 significant b3 non-significant

Based on the hypothesis test results for the post-moderation model described above—with the unit of analysis being publicly traded mining companies listed on the Indonesia Stock Exchange (IDX) that meet the research variable criteria—the following conclusions can be drawn:

- Risk has a positive and significant effect on stock price—measured by the closing price—with a probability of 0.0008 ($< \alpha$ 0.05) and a coefficient value of 0.129333.
- The Price-to-Book Value (PBV) has a positive and significant effect on the stock price—measured by the closing price—with a probability of 0.0001 (less than α = 0.05) and a coefficient value of 0.095230.
- The Fed rate has a significant negative effect on stock prices—measured by closing prices—with a probability of 0.0001 (less than α = 0.05) and a coefficient value of -42.84654.
- Oil prices have a significant negative effect on stock prices—measured by closing prices—with a probability of 0.0000 (less than α = 0.05) and a coefficient value of -0.012948.
- Firm size has a positive and significant effect on stock price (measured by closing price), with a probability of 0.0000 $< \alpha$ 0.05 and a coefficient value of 0.145559.
- Liquidity (measured by the Current Ratio) has a positive and significant effect on stock price (measured by closing price), with a probability of 0.0000 $< \alpha$ 0.05 and a coefficient value of 0.376588.
- Solvency (measured by the Debt-to-Equity Ratio) has a negative and significant effect on stock price

- (measured by closing price), with a probability of $0.0068 < \alpha 0.05$ and a coefficient value of -0.113189 .
- h. Inflation has no effect on stock price (measured by closing price), with a probability of $0.0901 > \alpha 0.05$ and a coefficient value of -4.495213 .
 - i. Risk has no effect on stock price when moderated by firm size, with a probability of $0.9778 > \alpha 0.05$. The firm size moderating variable is classified as a predictor moderator variable.
 - j. Price-to-Book Value (PBV) has a negative and significant effect on stock price when moderated by firm size, with a probability of $0.0010 < \alpha 0.05$ and a coefficient value of $-4.35E-$. The firm size moderating variable is classified as a pure moderator variable.
 - k. The Fed rate has no effect on stock price when moderated by firm size, with a probability of $0.3221 > \alpha 0.05$. The firm size moderating variable is classified as a predictor moderator variable.
 - l. Oil price has no effect on stock price when moderated by firm size, with a probability of $0.3182 > \alpha 0.05$. Firm size is classified as a moderating predictor variable.

The test results indicate that the inclusion of firm size as a moderator weakens the influence of financial risk, PBV, the Fed rate, and oil prices on stock prices. This suggests that the model assessing the influence of financial risk, PBV, the Fed rate, and oil prices prior to the introduction of the moderator is suitable for use.

3.2. The Impact of Risk on Stock Prices

The research results indicate that financial risk has a positive and significant effect on the stock prices of mining companies listed on the Indonesia Stock Exchange. This aligns with the single-index model theory, which posits that stock beta and stock price move in the same direction; specifically, a higher stock beta corresponds to a higher stock price for the investor. This finding can serve as a benchmark for investors seeking optimal returns, acknowledging that the associated risk is directly proportional.

The results support the research hypothesis stating that risk influences stock prices. Furthermore, these findings are consistent with previous studies indicating that systematic risk influences stock prices because investors consider the relationship between risk and expected return in investment decisions [9], [13]. These findings are inconsistent with previous research, which found that systematic risk has a negative effect on stock prices [10].

Low-priced stocks carry higher risk than high-priced stocks. If low stock prices entail risk for which investors do not receive appropriate compensation,

then the market efficiency hypothesis must be rejected. However, this study demonstrates that the price of bearing systematic risk is unrelated to stock price classification. In the long run, the average compensation is the same for both mutually exclusive price groups. This finding is supported by research showing that systematic risk has a negative but insignificant effect on stock prices [13].

These findings are inconsistent with previous research, which found that systematic risk has a negative effect on stock prices [10]. In contrast, previous studies reported that beta has no effect on stock prices [14], [15]. This occurs because systematic risk is an inherent risk that cannot be eliminated through diversification; therefore, fluctuations in systematic risk do not necessarily influence stock price movements. This study indicates that higher systematic risk leads investors to demand higher returns; the prospect of high returns attracts investors, thereby driving up stock prices. This aligns with the view that capital markets reflect macroeconomic conditions, as investment value is determined by expected cash flows and the return required by investors—both of which are influenced by changes in the macroeconomic environment. Thus, when estimating cash flows, interest rates, or risk premiums to determine the value of a security, one must incorporate macroeconomic analysis, including the assessment of systematic risk [16].

Systematic risk can drive changes in stock prices because it stems from macroeconomic factors [17]. Previous studies indicate that investors consider Return on Assets (ROA) because profit serves as an indicator of financial performance [18]. However, systematic risk is not always considered in investor decision-making because it does not originate from company fundamentals.

3.3. The Influence of Price Book Value on Stock Prices

The research findings indicate that PBV has a positive and significant effect on the stock prices of mining companies listed on the Indonesia Stock Exchange, where an increase in PBV leads to an increase in stock price. This demonstrates that PBV positively influences stock prices. These results align with the research hypothesis stating that PBV affects stock prices. Furthermore, the findings are consistent with previous studies showing that higher PBV values are associated with higher stock prices [13], [14]. This suggests that investors, both value-oriented and growth-oriented, can utilize price-to-book and price-to-sales multiples to evaluate stocks and assess the potential for future price appreciation. A high PBV value reflects management's success in effectively managing the company. A higher PBV value also increases investors' expectations regarding the potential for higher returns.

Price-to-Book Value (PBV) reflects a company's financial and operational performance; when investors

value a company for delivering satisfactory returns on their investments, the share price rises, and vice versa. Market value serves as an indicator of how the public values a company, influencing their willingness to purchase shares at higher prices—a demand that, in turn, drives up the share price itself—thereby demonstrating that market value can influence share prices [15].

Research on the Nigerian Stock Exchange demonstrated that price-to-book value and price-to-sales multiples are positively and significantly associated with the share prices of listed Nigerian companies [13]. Beyond their collective explanatory power regarding share prices, both the P/B and P/S multiples individually serve as predictors of share prices. The implication of these findings is that various classes of investors—specifically value and growth investors—can utilize price-to-book and price-to-sales ratios to value stocks and assess the potential for future price appreciation.

Research on consumer goods companies listed on the Indonesia Stock Exchange found a positive and significant influence of the Price-to-Book Value (PBV) ratio on stock prices [14]. The PBV ratio reflects management's success in managing the company; naturally, a higher PBV ratio raises investor expectations of achieving greater returns. In a study of telecommunications companies on the Indonesia Stock Exchange, reported that partial hypothesis testing confirmed a significant influence of PBV on stock prices [15]. This finding is supported by a study which stated that PBV movements have a significant positive impact on stock prices [19], [20].

The Price-to-Book Value ratio serves as a metric to determine whether a stock is undervalued or overvalued. The ratio of a stock's market price to its book value indicates investor sentiment toward the company, reflecting the value the financial market assigns to the management and the organization as a growing entity. A higher Price-to-Book Value ratio suggests stronger company growth, signaling to investors that the company is a profitable investment opportunity; ultimately, this drives up the company's stock price. Market appreciation of the stock's book value signifies a high level of market confidence in the company's future [21].

The Price-to-Book Value (PBV) ratio is a method for assessing whether a stock is undervalued or overvalued [19]. This ratio reflects whether a stock is considered relatively inexpensive or expensive. This ratio reflects whether a stock is considered costly or cheap. PBV serves as a parameter for measuring corporate performance; strong performance garners favorable market recognition, thereby instilling investor confidence to invest capital in the company. Naturally, companies with strong performance secure greater market recognition than those with poor performance.

A stock is considered expensive—or overvalued—if its PBV exceeds one, whereas a stock is considered cheap—or undervalued—if its PBV is below one.

In a study regarding the Indonesia Islamic Stock Index (ISSI), found that the Price-to-Book Value (PBV) ratio has a significant effect on stock prices [15]. Similarly, other study found a positive and significant relationship between PBV and stock prices on the Indonesia Stock Exchange (IDX) [14]. The PBV ratio reflects the level of management success in running the company; naturally, a higher PBV ratio raises investor expectations of achieving greater returns. In contrast, found in their research that the Price-to-Book Value (PBV) variable did not significantly affect stock prices [16].

3.4. The Impact of the Fed Rate on Stock Prices

The research results indicate that the Fed rate has a significant negative impact on stock prices; specifically, a high Fed rate leads to a decline in stock prices. This finding contradicts the research hypothesis, which posited a positive relationship between the Fed rate and stock prices. Notably, stock prices exhibit significant fluctuations in response to shocks in the Federal Funds Rate (FFR) [22]. This occurs because, when the Fed lowers interest rates, investors tend to allocate their funds to capital market transactions rather than purchasing Fed securities, thereby boosting capital market activity. This finding aligns with previous research, which identified a significant negative impact of the Fed rate on stock prices [23]. Furthermore, this study is consistent with previous research demonstrating that unexpected monetary policy actions affect stock prices by influencing expected future excess returns or expected future dividends, which subsequently affect stock valuations and equity risk premiums [24]. When the Fed raises interest rates, significant capital is absorbed within the U.S. economy, prompting investors to shift their preferences from stock market investments to savings instruments.

Previous studies found that changes in interest rates influence stock market movements because monetary policy affects investor expectations and asset valuation [25]. This finding contradicts previous research stating that Federal Reserve interest rates do not affect changes in the JCI (Jakarta Composite Index) [26]. Conversely, another study found no relationship between the stock market and interest rates, and vice versa [27].

Previous research indicates that announcements by the Fed, particularly those concerning interest rates, constitute significant information for the market [28]. The Fed's interest rate refers to the rate applied by the United States central bank when lending funds to commercial banks within the country. When the US central bank raises interest rates, the banking sector tends to increase its own rates, including savings and

time deposit rates. This condition encourages investors to shift funds from the capital market to banking instruments because they offer relatively higher returns with lower risk compared to stock market investments [29]. This reallocation of funds may contribute to a decline in stock prices, as reflected in stock indices such as the Jakarta Composite Index (JCI).

3.5. The Influence of World Oil Prices on Stock Prices

The research results indicate that oil prices have a significant negative impact on stock prices. Rising oil prices influence investor decisions, prompting them to shift funds from stocks to oil commodities. Reduced demand for stocks leads to a decline in stock prices. This demonstrates a negative relationship between oil prices and stock prices, consistent with previous studies showing that oil prices negatively affect stock prices [30]. These findings support previous studies indicating that global oil price fluctuations influence stock market performance through changes in economic conditions and investor expectations [31]. Similar results were observed in a previous study, which found a significant negative relationship between global oil prices and stock markets in Malaysia and Turkey [32].

Previous studies indicate that fluctuations in crude oil prices affect the stock prices of airlines, particularly those in China and South Korea, as well as Chinese oil companies [33], [34]. International crude oil price fluctuations are primarily driven by market supply and demand, the US dollar exchange rate, and speculative behavior. A rise in global oil prices tends to reduce corporate stock prices because it can increase operating costs, particularly for transportation companies. Conversely, investors seeking stable stock returns may sell their shares when global oil prices are expected to rise. When global oil prices decline, demand for company stocks tends to increase, which can drive stock prices upward. However, when a decline in global oil prices is predicted, investors may sell their holdings. Consequently, rising global oil prices can increase stock supply while reducing demand, causing stock prices to decline.

3.6. The Influence of Firm Size on Share Prices

Research findings indicate that firm size has a positive and significant effect on stock prices. Firm size represents a value that reflects the total assets owned by a company. Investors tend to focus on large companies, as the stability associated with such firms attracts them to invest in their shares. Stock prices in the capital market rise when there is high demand for a company's shares. Firm size can also be defined based on the scale of the company—assessed through equity value, firm value, or total assets. Larger companies can more easily access capital markets to secure substantial funding, thereby enabling them to maintain higher dividend payout ratios compared to smaller companies.

The results of this study align with previous research indicating that high total assets reflect a positive corporate image, accompanied by rising stock prices [35], [36].

Firm size, measured by total sales, provides greater information availability regarding the company throughout the year; consequently, firm size influences stock prices. Firm size represents a value that illustrates the extent of a company's assets. Investors tend to focus on large companies because their stability attracts investors to own their shares. Stock prices in the capital market increase when demand for a company's shares rises. Firm size can also be defined by the magnitude of a company based on equity value, firm value, or total assets. Larger companies can access capital markets more easily to obtain substantial funding, enabling them to maintain higher dividend payout ratios compared with smaller companies.

Research on the Pakistan Stock Exchange also demonstrated a significant positive relationship between firm size, dividend payments, and stock prices in the long term [37]. Causality test results revealed a bidirectional relationship between firm size, dividend payments, and stock prices among Pakistani non-financial companies. This indicates that firm size and dividend payments contribute positively to stock prices and serve as important determinants of stock prices in this sector. Previous research found that firm size significantly affects stock prices and moderates the relationship between earnings per share and stock prices [38]. These findings provide evidence that earnings and firm size offer important information for investors during decision-making.

3.7. The Effect of Liquidity (Current Ratio) on Stock Prices

Research findings indicate that liquidity, as measured by the Current Ratio, has a positive and significant effect on stock prices. The Current Ratio reflects a company's ability to meet its short-term obligations using current assets; a higher ratio indicates better short-term financial performance. A high Current Ratio can be influenced by factors such as cash flow levels and the company's credibility with creditors. When stakeholders consider this ratio in their assessment of a company, it can influence firm value as reflected in stock prices. This finding is consistent with previous studies suggesting that when current assets exceed current liabilities, companies are expected to have sufficient cash or assets that can be converted into cash to meet their obligations. Therefore, investors often use the Current Ratio as an important reference in investment decisions, which can contribute to higher stock prices [39], [40].

The current ratio (CR) indicates the relationship between a company's cash and other current assets and its current liabilities. This ratio illustrates the extent to

which current liabilities are covered by assets expected to be converted into cash in the near future. Regression analysis in this study reveals that the CR has a significant negative impact on stock prices; specifically, an increase in the CR leads to a decline in stock prices, and vice versa. These results indicate that a high CR resulting from excess current assets tends to reduce company profitability.

A low current ratio signals high liquidity risk, whereas a high current ratio indicates an excess of current assets that may negatively affect profitability. An excessively high current ratio suggests inefficient management of liquidity resources. Excess current assets could otherwise be utilized to pay dividends, settle long-term debt, or fund investments that generate higher returns. A high CR reduces profits and dividends; consequently, it may decrease investor interest in the company and cause stock prices to decline.

3.8. The Effect of Solvency (DER) on Stock Prices

The research results indicate that solvency, as measured by the Debt-to-Equity Ratio (DER), has a negative and significant effect on stock prices. This analysis suggests that the level of solvency—whether high or low—in this study influences stock prices. Although an effect was observed, companies must still pay attention to solvency levels (proxied by DER), as higher debt levels entail greater risk. High solvency can compromise a company's future liquidity due to interest payment obligations; furthermore, it can hinder performance growth and negatively impact stock price appreciation. Such high solvency levels stem from the unique characteristics of individual companies, as high ratios may result from either short-term or long-term debt.

These findings are supported by various research [41], [42], [43]. Based on signalling theory, a high Debt-to-Equity Ratio (DER) can signal "bad news"; investors perceive high debt as an indicator of significant risk and consequently avoid purchasing shares in companies with high DERs. There is an inverse relationship: the higher the DER, the lower the stock price, and vice versa. Thus, a higher DER corresponds to a lower stock price. This dynamic influences investor response; a market reaction indicating increased interest and demand for the stock drives the price upward.

The study demonstrates that DER has a negative and significant impact on stock prices, meaning that an increase in DER leads to a decline in stock prices. This occurs because, in companies with high debt levels, the associated risk is borne by shareholders. Investors are generally risk-averse; therefore, lower perceived risk can increase stock prices [1]. Consequently, a lower DER is associated with higher stock prices, and vice versa.

3.9. The Impact of Inflation on Stock Prices

Research findings indicate that inflation does not affect the stock prices of mining companies listed on the Indonesia Stock Exchange. In financial theory, the inflation rate, as reflected by the Consumer Price Index (CPI), represents the aggregate movement in the prices of goods and services. Previous research suggests that inflation rates influence stock market volatility and risk [44]. Studies have found that inflation has a negative effect on stock prices [45]. Conversely, other studies provide different findings, indicating that inflation has a positive effect on stock prices on the Indonesia Stock Exchange [46]. This finding is also supported by previous research showing that inflation has a significant positive effect on the Jakarta Composite Index (JCI) both simultaneously and partially [47]. The negative impact of inflation on stock prices is also demonstrated by previous studies showing that higher inflation can lead to a decline in company stock prices [48]. As stock prices decline, the composite stock price index also depreciates.

This study aligns with previous findings indicating that inflation does not affect stock prices [36]. Rising inflation increases corporate costs, compelling companies to raise selling prices to maintain profitability. If this condition persists in the short and long term, customers may switch to competitors. As this information spreads, investors may perceive the company's current performance and future prospects negatively, leading them to sell their shares and causing a downward correction in stock prices. However, not all investors respond in the same manner; investors focusing on long-term gains and the prospects of the mining sector may purchase undervalued shares, resulting in a positive price correction. Consequently, inflation does not have a significant impact on stock prices in this sector.

The results differ from previous findings indicating that inflation has a negative effect on stock prices, meaning that an increase in inflation is associated with a decline in stock prices, and vice versa [49], [50], [51]. Inflation has a complex impact on individual assets. Initially, it may lead to an increase in the nominal value of stocks.

3.10. The Effect of Risk on Stock Price Moderated by Firm Size

The research results indicate that firm size does not moderate the effect of financial risk on stock prices. An increase in risk leads to higher stock prices, and firm size strengthens the positive relationship between risk and stock prices. This finding is consistent with previous studies showing that systematic risk and firm characteristics influence stock price movements [52], [53], [54]. Moreover, the significant wealth often possessed by large companies influences investor valuation and increases confidence in the company's ability to maintain financial stability, ultimately

contributing to higher stock prices. Consequently, this condition assists investors and management in making strategic decisions, including stock pricing decisions.

3.11. The Effect of PBV on Stock Price Moderated by Firm Size

Research findings indicate that firm size does not moderate the effect of PBV on stock prices. Large firm size provides a positive signal to investors, leading to an increase in firm value. A large firm size reflects the potential for better future earnings [55]. Large firms generally exhibit strong operational performance and are considered well-established; therefore, increased corporate reliability is interpreted by investors as a positive signal regarding future prospects. Higher investor confidence and interest can drive stock prices upward, ultimately increasing firm value [6].

The larger a company's assets, the greater its capital; this can contribute to a higher Price-to-Book Value (PBV) ratio. Firm size serves as an indicator of strong performance, thereby exerting a positive influence on firm value [56]. Consequently, a higher PBV ratio signals better corporate growth, leading investors to view the company as a profitable investment opportunity [20]. Furthermore, previous research indicates that firm size moderates the relationship between PBV and stock price, suggesting that firm size can strengthen the effect of PBV on stock price [57].

3.12. The Effect of the Fed Rate on Stock Prices Moderated by Firm Size

This study indicates that firm size moderates the impact of the Fed rate on stock prices; specifically, firm size weakens this effect. An increase in the Fed rate tends to reduce stock prices, and firm size acts as a moderating factor in this relationship. This finding is consistent with previous studies suggesting that firm size influences the relationship between interest rate changes and stock price movements [58], [59], [60].

3.13. The Effect of Oil Prices on Stock Prices Which is Moderated by Firm Size

This study demonstrates that firm size does not moderate the impact of oil prices on stock prices; rather, firm size weakens this influence. These findings are consistent with previous research showing that small firms can maintain efficiency compared with larger firms [61]. The ability of small firms to maintain efficiency indicates that, when facing rising energy costs, they can substitute energy inputs with other production factors as effectively as large firms. Consequently, increases in oil prices may affect both small and large firms, thereby influencing stock price movements. Furthermore, previous research found that firm size influences the response of companies to energy price changes [62]. In absolute terms, the price elasticity of energy demand is lowest for small firms and highest for medium-sized firms. Medium-sized

firms occupy an intermediate position because they lack the production efficiency and financial strength of large firms while also lacking the flexibility of small firms. Oil price volatility affects investment decisions, which can influence stock price volatility [63]. Additionally, oil price shocks may interact with firm size characteristics in influencing financial conditions [64].

4. Conclusion

This study concludes that financial risk, Price-to-Book Value (PBV), Fed Rate, oil prices, firm size, liquidity, solvency, and inflation have different effects on stock prices of mining companies listed on the Indonesia Stock Exchange. Financial risk has a positive and significant effect on stock prices, indicating that investors may expect higher returns when facing greater risk. PBV has a positive and significant effect on stock prices, showing that higher company valuation is associated with stronger investor confidence. In contrast, the Fed Rate and oil prices have negative and significant effects on stock prices, indicating that external economic conditions influence investor behavior and market valuation. Firm size, liquidity, and solvency also affect stock prices, while inflation does not show a significant effect in this study. Furthermore, firm size moderates the relationship between PBV and stock prices by strengthening the influence, while it weakens the effects of risk, Fed Rate, and oil prices on stock prices. These findings provide empirical evidence that stock price movements are determined by both internal company characteristics and external macroeconomic conditions. The results contribute to financial literature by highlighting the importance of considering financial indicators, economic factors, and firm characteristics when analyzing stock market performance, particularly in the mining sector.

References

- [1] Brigham, E. F., & Houston, J. F. (2020). *Fundamentals of Financial Management*. Boston: Cengage Learning.
- [2] Manurung, A. H. (2008). *Strategi Memenangkan Transaksi Saham di Bursa*. Jakarta: Gramedia.
- [3] Shim, J. K., & Siegel, J. G. (2007). *Handbook of Financial Analysis, Forecasting, and Modeling*. CCH.
- [4] Venugopal, A., Krishnan, T. N., Upadhyayula, R. S., & Kumar, M. (2020). Finding the microfoundations of organizational ambidexterity: Demystifying the role of top management behavioural integration. *Journal of Business Research*, 106, 1–11. <https://doi.org/10.1016/j.jbusres.2019.08.049>
- [5] Zhang, J., Wang, G., & Yan, C. (2020). Can foreign equity funds outperform their benchmarks? New evidence from fund-holding data for China. *Economic Modelling*, 90, 11–20. <https://doi.org/10.1016/j.econmod.2020.04.025>
- [6] Chabachib, M., Hersugondo, H., Ardiana, E., & Pamungkas, I. D. (2020). Analysis of Company Characteristics of Firm Values: Profitability as Intervening Variables. *International Journal of Financial Research*, 11(1), 60. <https://doi.org/10.5430/ijfr.v11n1p60>

- [7] Ekananda, M. (2019). *Analisis Ekonometrika Untuk Keuangan*. Jakarta: Salemba Empat.
- [8] Lopez, J. A. (2004). The empirical relationship between average asset correlation, firm probability of default, and asset size. *Journal of Financial Intermediation*, 13(2), 265-283. [https://doi.org/10.1016/S1042-9573\(03\)00045-7](https://doi.org/10.1016/S1042-9573(03)00045-7)
- [9] Iqbal, M. J., & Shah, S. H. A. (2012). Determinants of Systematic Risk. *The Journal of Commerce*, 4(1), 47-56.
- [10] Astuty, P. (2017). The Influence of Fundamental Factors and Systematic Risk to Stock Prices on Companies Listed in the Indonesian Stock Exchange. *European Research Studies Journal*, 20(4A).
- [11] Gujarati, D. N., & Porter, D. C. (2009). *Basic Econometrics* (5th ed.). New York: McGraw-Hill.
- [12] Ghazali, I., & Ratmono, D. (2017). *Analisis Multivariat Dan Ekonometrika Teori Konsep dan Aplikasi dengan Eviews 10*. Semarang: Badan Penerbit Universitas Diponegoro.
- [13] Shittu, I., Ahmad, A. C., & Ishak, Z. (2016). Price to Book Value, Price to Sales Multiples and Stock Price: Evidence from Nigerian Listed Firms. *Journal of Advanced Research in Business and Management Studies*, 3(1), 85-93.
- [14] Salim, M. N., & Firdaus, Z. (2020). Determinants of Firm Value and Its Impact on Stock Prices (Study in Consumer Good Public Companies in IDX 2014-2018). *Dinasti International Journal of Education Management and Social Science*, 2(1), 41-54. <https://doi.org/10.31933/dijemss.v2i1.506>
- [15] Hanifah, A. (2019). The Effect of Earning Per Share (EPS), Price Earning Ratio (PER) and Price Book Value (PBV) Against the Stock Price of Telecommunications Sector Company Included in the Indonesian Islamic Stock Index (ISSI). *KnE Social Sciences*, 711-726. <https://doi.org/10.18502/kss.v3i26.5410>
- [16] Makdalena, M., Beliani, I., & Budiantara, M. (2015). Pengaruh Price Earning Ratio dan Price to Book Value terhadap Harga Saham Perusahaan Asuransi yang Terdaftar di Bursa Efek Indonesia Tahun 2009-2012. *JRAMB Jurnal Riset Akuntansi Mercu Buana*, 1(1). <https://doi.org/10.26486/jramb.v1i1.12>
- [17] Dyatmiko, R. (2019). Dampak fundamental dan risiko sistematis terhadap harga saham perbankan Indonesia. *Scientific Journal of Reflection: Economic, Accounting, Management and Business*, 2(4), 441-450.
- [18] Duhita, V. Z. N., & Laila, N. (2019). Pengaruh Faktor Fundamental dan Risiko Sistematis Terhadap Harga Saham Perusahaan di Pasar Modal Syariah (Studi Kasus di Jakarta Islamic Index Periode 2014-2017). *Jurnal Ekonomi Syariah Teori dan Terapan*, 6(10), 1984-1994.
- [19] Fathihani, F. (2020). Effect of NPM, EPS, ROE, and PBV on stock prices. *Dinasti International Journal of Management Science*, 1(6), 893-902.
- [20] Angela, N. K., & Masjud, Y. I. (2018). The Analysis of Stock Price in Tourism Industry Listed in Indonesia Stock Exchange 2012-2016. *JAAF (Journal of Applied Accounting and Finance)*, 2(2), 153-162. <https://doi.org/10.33021/jaaf.v2i2.552>
- [21] Paryanto, P., & Sumarsono, N. D. (2018). The effect of financial performance of companies on share return in manufacturing companies listed in Indonesia Stock Exchange year 2014-2016. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, 2(02). <https://doi.org/10.29040/ijebar.v2i02.273>
- [22] Kontonikas, A., Maio, P., & Zekaite, Z. (2017). Monetary policy and corporate bond returns.
- [23] Guo, H. (2004). Stock prices, firm size, and changes in the federal funds rate target. *The Quarterly Review of Economics and Finance*, 44(4), 487-507. <https://doi.org/10.1016/j.qref.2003.11.001>
- [24] Bernanke, B. S., & Kuttner, K. N. (2005). What explains the stock market's reaction to Federal Reserve policy?. *The Journal of finance*, 60(3), 1221-1257. <https://doi.org/10.1111/j.1540-6261.2005.00760.x>
- [25] Amarasinghe, A. A. M. D. (2015). Dynamic relationship between interest rate and stock price: Empirical evidence from Colombo stock exchange. *International Journal of Business and Social Science*, 6(4), 92-97.
- [26] Wijayaningsih, R., Rahayu, S. M., & Saifi, M. (2016). *Pengaruh bi rate, fed rate, dan kurs rupiah terhadap indeks harga saham gabungan (IHSG) (Studi pada Bursa Efek Indonesia periode 2008-2015)*. Brawijaya University.
- [27] Somasundaram, V. K., & Muthukumaran, T. (2014). Causality Relationship between Exchange Rate and Stock Returns in India-An Analytical Study. *HuSS: International Journal of Research in Humanities and Social Sciences*, 1(2), 111-116.
- [28] Figlewski, S. (2018). Risk-neutral densities: A review. *Annual Review of Financial Economics*, 10(1), 329-359. <https://doi.org/10.1146/annurev-financial-110217-022944>
- [29] Surbakti, E. H. (2016). *Pengaruh Variabel Makroekonomi Terhadap Volatilitas Return Indeks Saham Ihsg Periode Sebelum dan Sesudah Krisis Ekonomi Global (2002-2014)* (Doctoral Dissertation, Institut Pertanian Bogor).
- [30] Dhaoui, A., & Khraief, N. (2014). Sensitivity of trading intensity to optimistic and pessimistic beliefs: Evidence from the French stock market. *Arab Economic and Business Journal*, 9(2), 115-132. <https://doi.org/10.1016/j.aebj.2014.05.008>
- [31] Gumilang, R. C., Hidayat, R. R., & Np, M. G. W. E. (2014). Pengaruh variabel makro ekonomi, harga emas dan harga minyak dunia terhadap indeks harga saham gabungan (Studi pada Bursa Efek Indonesia Periode 2009-2013). *Jurnal Administrasi Bisnis*, 14(2).
- [32] Najaf, R. (2016). Impact of oil price fluctuations on returns of different sectors of Malaysian and Turkey stock exchange. *Indian Journal of Management Science*, 6(2), 21.
- [33] Yun, X., & Yoon, S. M. (2019). Impact of Oil Price Change on Airline's Stock Price and Volatility: Evidence from China and South Korea. *Energy Economics*, 78, 668-679. <https://doi.org/10.1016/j.eneco.2018.09.015>
- [34] Huang, Y., & Zhuo, Q. (2022). The Influence of International Crude Oil Price on the Stock Price of Chinese Oil Companies. *International Journal of Trade, Economics and Finance*, 13(3), 66-70. <https://doi.org/10.18178/ijtef.2022.13.3.726>
- [35] Ariesa, Y., Tommy, T., Utami, J., Maharidha, I., Siahaan, N. C., & Nainggolan, N. B. (2020). The Effect of Current Ratio (CR), Firm Size (FS), Return on Equity (ROE), and Earning Per Share (EPS) on the Stock Prices of Manufacturing Companies Listed in Indonesia Stock Exchange in the 2014-2018 Period. *BIRCI-Journal*, 3(4).
- [36] Soedarsa, H. G., & Arika, P. R. (2015, July). The influence of inflation, gdp growth, size, leverage, and profitability towards stock price on property and real estate companies listed in Indonesia stock exchange period 2005-2013. In *International Multidisciplinary Conference on Social Sciences (IMCoSS)* (Vol. 1, p. 50).
- [37] Raza, S. A., & Karim, M. Z. A. (2016). Do Liquidity and Financial Leverage Constrain the Impact of Firm Size and Dividend Payouts on Share Price in Emerging Economy. *Journal of Finance and Economics Research*, 1(2), 73-88. <https://doi.org/10.20547/jfer1601201>
- [38] Yuliza, A. (2018). The Effects of Earnings Per Share and Firm Size to Stock Price LQ45 Company Listed in Indonesian

- Securities. *International Journal of Engineering & Technology*, 7(4.9), 247. <https://doi.org/10.14419/ijet.v7i4.9.21089>
- [39] Handayani, H., Muharam, H., Mawardi, W., & Robiyanto, R. (2018). Determinants of the Stock Price Volatility in the Indonesian Manufacturing Sector. *International Research Journal of Business Studies*, 11(3), 179–193. <https://doi.org/10.21632/irjbs.11.3.179-193>
- [40] Kohansal, M. R., Dadrasmoghaddam, A., Karmozdi, K. M., & Mohseni, A. (2013). Relationship between Financial Ratios and Stock Prices for the Food Industry Firms in Stock Exchange of Iran. *World Applied Programming*, 3(10), 512–521.
- [41] Wulansari, T., Sulastri, S., Widiyanti, M., & Adam, M. (2023). The effect of financial ratio on stock price in telecommunications sector companies listed on the Indonesia stock exchange. *International Journal of Business, Economics and Management*, 6(1), 1-9.
- [42] Nugraha, K. C., & Artini, L. G. S. (2022). The Effect of Financial Performance on Stock Prices of Automotive and Component Sub Sector Companies in the Indonesia Stock Exchange. *European Journal of Business and Management Research*, 7(4), 327-331.
- [43] Ratnasari, I., & Ramadhani, I. (2022). The effect of return on assets (ROA) and debt to equity ratio (DER) on stock prices on insurance sub sector companies listed on the Indonesia stock exchange (IDX) period 2014-2018. *Management Research and Behavior Journal*, 2(1), 37-43. <https://doi.org/10.29103/mrbj.v2i1.7443>
- [44] Geetha, C. (2011). The relationship between inflation and stock market: Evidence from Malaysia, United States and China. *International Journal of Economics and Management Sciences*, 1(2), 1-16.
- [45] Menike, L. M. C. S. (2006). The effect of macroeconomic variables on stock prices in emerging Sri Lankan stock market. *Sabaragamuwa university journal*, 6(1), 50-67. <https://doi.org/10.4038/suslj.v6i1.1689>
- [46] Raharjo, S. (2010). Analisis Pengaruh Informasi Akuntansi Terhadap Harga Saham Pada Perusahaan Manufaktur Di Bursa Efek Indonesia.
- [47] Krisna, A. A. G. A., & Wirawati, N. G. P. (2013). Pengaruh inflasi, nilai tukar Rupiah, suku bunga sbi pada indeks harga saham gabungan di BEI. *E-Jurnal Akuntansi Universitas Udayana*, 3(2), 421-435.
- [48] Almilial, L. S. (2013). Internet financial reporting: studi komparasi perusahaan manufaktur yang terdaftar di Bursa efek Indonesia dan Bursa efek Malaysia. *Jurnal bisnis dan Ekonomi*, 20(2), 100-112.
- [49] Quayes, S., & Jamal, A. (2008). Does inflation affect stock prices?. *Applied Economics Letters*, 15(10), 767-769. <https://doi.org/10.1080/13504850600770871>
- [50] Kurotamunobaraomi, T., & Ebiware, A. E. (2017). Inflation and stock prices: The Nexus. *International Journal of Banking and Finance Research*, 3(1), 49-58.
- [51] Eldomiaty, T., Saeed, Y., Hammam, R., & AboulSoud, S. (2020). The associations between stock prices, inflation rates, interest rates are still persistent: Empirical evidence from stock duration model. *Journal of Economics, Finance and Administrative Science*, 25(49), 149-161. <https://doi.org/10.1108/JEFAS-10-2018-0105>
- [52] Abdulahi, I. B., Lawal, W. A., & Etudaiye-Muhtar, O. F. (2011). The Effects of Firm Size on Risk and Return in the Nigerian Stock Market: A Sectoral Analysis. *British Journal of Economics, Finance and Management Sciences*, 1(2).
- [53] Gengatharan, R., Al Harthi, E. S., & Al Malki, S. S. (2020). Effect of Firm Size on Risk and Return: Evidences from Sultanate of Oman. *European Journal of Business and Management*, 12(9), 62–71. <https://doi.org/10.7176/ejbm/12-9-08>
- [54] Akbari, P., Rostami, R., & Veismoradic, A. (2012). A Study of the Effects of Company Size on Systematic Risk Based on the Capital Asset Pricing Model Among Accepted Companies in Tehran Stock Market. *Management Science Letters*, 2, 1455–1464.
- [55] Setiadharna, S., & Machali, M. (2017). The Effect of Asset Structure and Firm Size on Firm Value with Capital Structure as Intervening Variable. *Journal of Business & Financial Affairs*, 6(4). <https://doi.org/10.4172/2167-0234.1000298>
- [56] Husna, A., & Satria, I. (2019). Effects of Return on Asset, Debt to Asset Ratio, Current Ratio, Firm Size, and Dividend Payout Ratio on Firm Value. *International Journal of Economics and Financial Issues*, 9(5), 50–54. <https://doi.org/10.32479/ijefi.8595>
- [57] Sihalo, J., & Rochyadi, A. P. (2021). The Influence of PER, EPS, PBV on Stock Price and Firm Size as Mediators in Food and Beverage Sub-Sector Manufacturing Companies Listed on The Indonesia Stock Exchange 2015–2020. *International Journal of Economics, Business and Accounting Research (IJEBAAR)*, 5(4), 432–446.
- [58] Cowling, M., & Sugden, R. (1995). Small Firm Lending Contracts: Do Banks Differentiate Between Firms? *Journal of Small Business Finance*, 4(1), 87–98.
- [59] Dietrich, A. (2012). Explaining Loan Rate Differentials Between Small and Large Companies: Evidence from Switzerland. *Small Business Economics*, 38(4), 481–494. <https://doi.org/10.1007/s11187-010-9273-8>
- [60] Sami, M., Eldomiaty, T. I., & Kamal, M. (2020). How Do Fund Rates Affect the U.S. Firms? A Threshold Estimation. *Central Bank Review*, 20(2), 75–84. <https://doi.org/10.1016/j.cbrev.2020.03.003>
- [61] Nguyen, S. V., & Lee, S. H. (2002). Returns to Scale in Small and Large U.S. Manufacturing Establishments: Further Evidence. *Small Business Economics*, 19(1), 41–50. <https://doi.org/10.1023/A:1015714305990>
- [62] Kleijweg, A., Huigen, R., van Leeuwen, G., & Zeelenberg, K. (1990). Firm Size and the Demand for Energy in Dutch Manufacturing, 1978–1986. *Small Business Economics*, 2(3), 171–181. <https://doi.org/10.1007/BF00389525>
- [63] Alaali, F. (2020). The Effect of Oil and Stock Price Volatility on Firm Level Investment.
- [64] Smoluk, B. (2018). Oil Price Shocks: Bank Size and Firm Size Effects. *Journal of Finance and Economics*, 10(1), 1–25. <https://doi.org/10.12735/jfe.v10n1p1>