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Determinants Of Mining Company Value Level In Indonesia Stock Exchange

Eko Budi Satoto*
Department of Management, Faculty of Business Economics, Universitas Muhammadiyah Jember

Email Address:
*ekobudisatoto@unmuhjember.ac.id**
**Corresponding Author*

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Abstract: The supply chain of mining businesses listed on the Indonesia Stock Exchange (IDX) has declined due to the significant impact brought about by the uncertainty of an increasingly complex world economic climate. This study aims to determine the relationship between interest rates, inflation, currency exchange rates, stock returns, and firm value. Structural Equation Modeling (SEM) analysis was conducted to decipher the data in this study. The research findings show that the mining industry in Indonesia is highly influenced by macroeconomic factors, especially interest rates, inflation, and exchange rates. The negative relationship between interest rates and inflation negatively affects stock returns and firm value. Meanwhile, it increased the rupiah's value positively and significantly influenced stock returns and business value. Higher stock returns can increase the value of mining companies listed on the Indonesia Stock Exchange (IDX).
Keywords: Interest rates; Inflation; exchange rates; Stock Returns; Firm Value.

Abstrak: Rantai pasokan bisnis pertambangan yang terdaftar di Bursa Efek Indonesia (BEI) telah menurun sebagai akibat dari dampak signifikan yang ditimbulkan oleh ketidakpastian iklim ekonomi dunia yang semakin kompleks. Tujuan dari penelitian ini adalah untuk mengetahui hubungan antara tingkat suku bunga, inflasi, dan nilai tukar mata uang, serta return saham dan nilai perusahaan. Dalam penelitian ini, analisis Structural Equationn Modeling (SEM) dilakukan untuk menguraikan data. Temuan penelitian menunjukkan bahwa industri pertambangan di Indonesia sangat dipengaruhi oleh faktor makroekonomi, terutama suku bunga, inflasi, dan nilai tukar. Hubungan negatif antara suku bunga dan inflasi mempengaruhi return saham dan nilai perusahaan secara negatif. Di sisi lain, pengaruh positif dan signifikan terhadap return saham dan nilai bisnis terjadi karena adanya peningkatan nilai rupiah. Return saham yang lebih tinggi dapat meningkatkan nilai perusahaan pertambangan yang terdaftar di Bursa Efek Indonesia (BEI).
Kata Kunci: Suku Bunga; Inflasi; Kurs; Return Saham; Nilai Perusahaan.

INTRODUCTION

The Federal Reserve, the primary depository institution for the United States of America, declared a 0.750 per cent rise in interest rates to 1.750 per cent to reduce the escalating prices of commodities. The increase in the benchmark interest rate was the highest made by the US central bank—known as the Fed—in the last 30 years. Higher bank interest rates have fueled increased demand for dollars and seen the US dollar appreciate 10 per cent since the start of the year. As a result, the value of other currencies weakened, including the rupiah. In addition, in Indonesia, there was an impact of the rise in fuel prices, which is the rising prices of staple commodities. These commodities provide a sizable multiplier effect to the economy. If fuel prices rise, prices in other sectors will likely increase as well, which can lead to inflation. BPS noted that the increase in fuel prices contributed around 19 to 20 per cent to inflation in general. The increase in fuel

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prices drove an increase in Indonesian inflation, which began in September 2022, reaching 5.950 per cent. Indonesia's inflation projection throughout 2022 will be above 5 per cent, and in 2023, it will not be impossible to reach beyond 6.200 per cent (Panin Asset Management, 2022).

In determining an effective investment portfolio, investors usually choose an inevitable, expected return, reduce risk or determine the level of risk and then increase the expected return; investors may choose this successful investment portfolio because it increases the two defined by one of the dimensions. To construct a successful investment portfolio, it is essential to consider the potential risk and uncertainty involved, identify the expected return, assess the security's return, and determine the stock's level of risk. Investors should evaluate the most appropriate balance between return and risk. Both the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT) are viable options for valuing assets and determining prices to evaluate the investment potential of stocks (Adnyana et al., 2017; Andyani & Mustanda, 2018; Choirunnisak, 2019; Kusumaningtyas et al., 2021).

The CAPM Model (*Capital Asset Pricing Model*) contains macro elements that reflect the perception of the market portfolio, enabling it to determine the balance between the odds and the payoff. The primary purpose of utilizing the CAPM is to provide risk and return on related assets; it is expected that property prices will be determined, and the CAPM will be used as the basis for the definition of groups, which may be selected as investment locations (Kasmir, 2021; Kharisma et al., 2019; Mustofa et al., 2020; Wardita et al., 2021).

The CAPM model is a new revolution in the financial economy that can explain and determine what risk is in a capital market, what risk is valued (assessed), or what extra return an investor will receive with the risk he faces. Another opinion emerged after the introduction of CAPM. Many empirical studies have tested whether the model adequately describes the behaviour of market stock prices in practice (Okechukwu et al., 2019; Setiyorini & Kartika, 2018).

The Arbitrage Pricing Theory (APT), created by Stephen Ross in the mid-1970s, was the first theory to gain traction as an alternative to the Capital Asset Pricing Model (CAPM). Since APT begins its discussion by establishing a capital market scenario in which the securities traded are frictionless, it is widely held that it is systematically and intuitively more difficult than CAPM. Unlike the CAPM, which uses a single-factor model, the APT states that several factors determine assets. These factors reflect the systematic risk that cannot be diversified: Interest Rates, Inflation, and Exchange Rates (Djidu et al., 2021; Melyani & Esra, 2021; Purnasari et al., 2020).

Several studies by researchers such as (Cao et al., 2019); (Hwang et al., 2021); (Pandaya et al., 2020); (Jefry & Djazuli, 2020); (Suharyanto & Zaki 2021); (Safitri et al., 2021); and (Vikaliana, 2017) have found evidence that the rates of interest, inflation, and the rates of exchange make an impression on the value of firms. However, there is a research gap in the literature, as some studies by (Dura, 2021); (Oware & Mallikarjunappa, 2022) (Thottoli & Thomas, 2021) have produced conflicting results, suggesting that these factors may not affect firm value.

This study attempts to address this gap by examining the influence of inflation, rates of interest, and exchange rates on mining companies listed on the Indonesian Stock Exchange (IDX) to assist stakeholders in making informed decisions regarding share

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transactions. The volatile buy and sell activity of shares of companies involved in mining that are traded on the Indonesian Stock Exchange (IDX) was a consequence of the unstable global economy. Given that Russia is one of the world's largest oil producers, the Russian-Ukraine war significantly affected global oil prices, increasing.

This conflict also affected the performance of shares of Indonesian Stock Exchange (IDX) listed mining companies. Incorporating stock returns as an intervening variable represents the most recent breakthrough in this line of investigation. This is because stock returns represent one of the standards that can be used to measure a company's capacity to generate profits from investment activities. In addition, the relationship between stock returns and firm value is positive, per the signal theory. This implies that the firm value will also increase if stock returns increase.

This research presents a novel contribution to the field by addressing a critical research gap in the literature. While previous studies have examined the impact of interest rates, inflation, and exchange rates on firm values, a notable need exists for more consensus on the findings. Some studies suggest a significant influence of these macroeconomic variables, while others indicate limited or conflicting effects. The unique aspect of this study lies in its comprehensive investigation of these variables within the specific context of mining companies listed on the Indonesian Stock Exchange (IDX).

This approach is timely and crucial, given the recent upheavals in global oil prices due to geopolitical events, which have pronounced impacts on Indonesian mining stocks. Furthermore, incorporating stock returns as an intervening variable adds depth to the analysis, as it aligns with the signal theory, indicating a potential positive relationship between stock returns and firm value. By delving into these dimensions and offering empirical insights, this research aims to provide valuable guidance to stakeholders, investors, and policymakers in navigating the complexities of the Indonesian stock market amidst changing macroeconomic conditions.

THEORETICAL REVIEW

The motivation for companies to release financial data to the public can be explained by "signalling theory." So that there is no imbalance of information between the company and outsiders, it actively encourages information sharing. The company feels it can better predict its future than its outsiders (investors and creditors), and thus is sending this message. If prospective external investors encounter limited information regarding the company, their willingness to offer a substantial financial valuation will diminish. Businesses can increase their value by signalling to outsiders in order to reduce information asymmetry (Auliya et al., 2020; Harjoto et al., 2017; Harjoto et al., 2019; Mohammadi & Saeidi, 2022; Shirasu & Kawakita, 2021; Yang & Susanto, 2021).

As soon as the announcement is made and the market receives the information, it will be evaluated to determine if it is a good or bad signal. The release of accounting information indicates that the company has promising prospects (good news), thereby generating investor interest in trading equities. The presence of a signal will cause the market to react, which will be reflected in volume fluctuations of the stock (Bae et al., 2020; Utz, 2018; Yulinartati et al., 2019; Zolotoy et al., 2019).

The rate at which an investment generates a profit is one of the driving forces behind their decision to put money into the stock market. The willingness of investors to take on

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the inherent risks of their investments is rewarded with a return on their investments. Investors anticipate receiving compensation for lost opportunity costs and protection against the danger of diminishing their purchasing power due to inflation. When discussing the management of investments, the rate of return on investment is referred to as the stock return rate. When it comes to investment management, two types of stock returns may be distinguished: expected stock returns and returns that materialize (also known as realized returns) (Q. N. Alam, 2020; Li et al., 2021; Septiana et al., 2021; Vo, 2019; Wei et al., 2020).

Interest is a payment for capital borrowed from third parties (Heimbach et al., 2023). The interest rate is the amount of interest represented as a percentage of capital. To put it another way, the interest rate is the percentage of repayment of capital borrowed from third parties, such as outsiders, the profit rate gained by bank savers, or the amount of charges suffered by investors who invest their funds in stocks. According to (Kasmir, 2021), bank interest is a recompense banks offer to consumers who buy or sell their products based on conventional standards. Interest can also be defined as the difference between the price that must be paid to customers (those who have deposits) and the price that must be paid to banks (those who get loans) (Adnyana et al., 2017; Andyani & Mustanda, 2018; Choirunnisak, 2019; Kusumaningtyas et al., 2021).

Inflation is a continuous and widespread increase in the cost of products (Purnasari et al., 2020). An increase in the cost of only one or two individual products can only be considered inflation if it extends to (or causes price increases in) additional goods. The problems and causes of inflation in the economy are highly complex. Inflation is caused not only by an excessive money supply but also by other variables such as wage increases, instability on the political front, inflationary pressures from abroad, and a falling value of the currency (Kasmir, 2021; Kharisma et al., 2019; Mustofa et al., 2020; Wardita et al., 2021).

The value of one currency expressed in terms of another currency is referred to as the exchange rate. It is typically employed in transactions between two or more nations. Exchange rates refer to the cost of purchasing one nation's currency with another's currency relative to the currencies of other nations (Adhawiyah et al., 2018). The exchange rate plays a significant role in purchasing decisions because it allows us to translate prices from different countries into a single language. If all other factors remain constant, a depreciation (increase in the price of foreign exchange for that country) causes exports to become less expensive but imports to become more prohibitively costly. When the value of a country's currency rises (appreciation), imports become more significant in cost, while exports become more economical (Okechukwu et al., 2019; Setiyorini & Kartika, 2018).

The price at which potential buyers (investors) are willing to purchase a company is the price at which that company's value can be determined. The maximization of shareholder wealth is the primary focus of the company's efforts. Maximizing the prosperity of shareholders can be accomplished through the process of maximizing the value of the company. Use Tobin's Q analysis to determine the value of the company. Tobin's Q analysis also goes by the name Tobin's Q ratio. Both of these names refer to the same thing. This ratio is critical because it reveals the financial market's current estimate of each dollar's prospective return on investment. The ratio of the market value of a company's stock and debt to the market value of the company's total assets is what is used

to calculate Tobin's Q (Djidu et al., 2021; Melyani & Esra, 2021; Purnasari et al., 2020; Zulfikar et al., 2020).

The Relationship of Interest Rates to Firm Value. According to classical economic theory, the size of an investment depends on the interest rate level (Dorfleitner et al., 2018). If interest rates are high, investments tend to be smaller, and vice versa. High-interest rates incentivize individuals to deposit their funds in banks rather than invest in the production or industrial sector, where the risks are typically higher than investing in banks, especially in the form of deposits. The BI interest rate is the benchmark interest rate set by the Bank of Indonesia (BI) for loans and deposits offered by banks and financial institutions across Indonesia. Interest rates are a crucial factor that can influence stock prices.

When interest rates rise, there is typically a decrease in share demand because investors tend to opt to keep their funds in banks rather than invest in stocks. Consequently, this situation leads to decreased stock prices and a decline in the overall company value. Higher interest rates automatically prompt people to favour keeping their funds in banks as they anticipate more profitable returns. In such a scenario, people's demand for holding cash decreases because they are more inclined to allocate their funds to various banking options such as deposits and savings. Recent studies conducted by (Bagaswara & Wati, 2020) (Novriyani, 2021) (Nurulhuda & Kosasih, 2019) (Rasudu, 2021) (Wijaya & MN, 2022) have found that interest rates have a significant impact on firm value. Therefore, it can be concluded that interest rates play an important role in investment decisions and can affect the value of firms:

H1: Interest rates affect Firm Value.

Relationship of Inflation to Firm Value. According to (Hendayana & Riyanti, 2019), inflation is defined as a continuous and general increase in the prices of goods. Rising inflation can significantly affect a company's financial performance by reducing its sales value and ultimately decreasing profits. The decline in profitability experienced by a company can deter many investors from investing in it. Consequently, the decreased demand for shares leads to decreased share prices, ultimately reducing the company's overall value. Inflation refers to the continuous increase in general prices, which is highly likely to impact a company's production costs. High production costs can increase the selling price of goods, reducing sales volume and ultimately harming the company's performance, as reflected by a decline in its stock return.

Uncontrolled inflation can also have several other negative consequences, such as a decline in real income for the public, a decrease in domestic savings (a source of investment funds for people in developing countries), a reduction in entrepreneurs' enthusiasm for investing, and a decline in the value of money. Several studies conducted by (Muhadi, 2019); (Nugraha & Nursito, 2021); (Nugroho & Hermuningsih, 2020); (Nurulhuda & Kosasih, 2019); (Ratnasari et al., 2021) have found that inflation has a significant impact on Firm value so that it can be concluded:

H2: Inflation affects Value Company.

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The Relationship of Exchange Rates to Firm Value. For investors who invest in various countries with various currencies, changes in currency exchange rates will be a factor causing actual returns to be lower than the expected returns. Changes in exchange rates can be caused by changes in demand for the country's currency in international trade and currency as a commodity that is traded. For export-oriented companies, the depreciation of currency values positively impacts the business. This is because the ability to compete at the introductory price in the international market has increased. Interest rates can serve as a guiding factor for investors when making investment decisions in the capital market.

The capital market offers returns at various risk levels as an investment alternative. High-interest rates can influence investment choices in stocks, bonds, and deposits. Elevated interest rates can create a mismatch between return expectations and reality, causing investors to prefer placing their funds in deposits rather than purchasing shares. Conversely, low-interest rates result in reduced borrowing costs, stimulating increased investment and economic activity, ultimately leading to higher stock prices. Interest rates represent the cost of using money for a specified period or the price of utilizing funds at present with repayment due in the future (Hasan et al., 2022).

An increase in interest rates will raise production costs, leading to higher prices for goods and a decrease in consumer interest, directly impacting sales and profits. Investors will also bear rising interest costs, primarily in increased company interest expenses. Elevated interest rates can discourage individuals from investing in stocks, as the high costs pose a risk many would rather avoid, resulting in a stagnant investment environment. This situation can lead companies to face challenges in maintaining their operations, resulting in declining performance. As a consequence, declining company performance can lead to a decrease in stock prices, which, in turn, diminishes the company's overall value. The result of a previous study (Estuti & Fauziyanti, 2018; Ihsan et al., 2018) shows that the Exchange Rate affects Firm Value. Therefore, it can be concluded:

H3: Exchange Rates Affect Firm Value.

The Relationship of Interest Rates to Firm Value through Stock Returns as an Intervening Variable. According to the theory known as the International Fisher Effect (IFE), the difference in interest rates between two countries will cause the exchange rate of two currencies to move in a fluctuating pattern. According to the IFE, the value of a currency is more likely to appreciate in comparison to another currency when it has a lower interest rate than when it has a higher interest rate.

To illustrate, a currency with a high-interest rate tends to depreciate, whereas a currency with a low-interest rate tends to appreciate; this demonstrates a positive relationship between the two variables. Because of this, an increase in interest rates may increase the exchange rate, as the value of the rupiah will decrease compared to that of the dollar.

When a country's central bank raises interest rates, its currency becomes more attractive to foreign investors, as they can earn higher returns on their investments. This increased demand for the domestic currency strengthens its value relative to other currencies, including the dollar. In the context of the rupiah, if Indonesia's central bank raises interest rates, it will likely result in an exchange rate appreciation, causing the rupiah

to strengthen against the dollar. However, it is essential to remember that various economic and policy factors can influence the relationship between interest rates and exchange rates, making the actual outcome potentially more complex. According to the research conducted by (Basarda et al., 2018) (Dara & Windayanti, 2019) (Suriyani & Sudiartha, 2018) and (Tandelilin, 2017), interest rates affect Firm value by way of stock returns as an intervening variable. As a result, the following can be deduced from these findings:

H4: Interest rates affect Firm value through Share Return as an Intervening variable.

Relationship of Inflation to Firm Value through Stock Returns as an Intervening variable. When prices increase, consumers pay more for the goods and services they buy, while producers earn more revenue for the goods and services they sell (Spurr, 2019). As most people earn their income by selling their services, price inflation is linked to income inflation. When the prices of goods and services experience a significant increase, consumer spending tends to rise, particularly among those who rely on income from their jobs or businesses. However, to cope with these rising prices, employers and workers often aim to increase their rates or salaries, thereby adding additional pressure to the rate of income inflation. In situations characterized by significant inflation, individuals may explore ways to protect their income, such as seeking additional employment or pursuing more profitable investments. The findings of several studies conducted by (A. Alam et al., 2020; Assagaf et al., 2019; Nurulhuda & Kosasih, 2019) indicate that inflation affects the value of a firm through the intervening variable of stock returns. Therefore, it can be concluded that:

H5: Inflation affects Firm value through Stock Returns as an Intervening variable.

Exchange Rate Relationship to Firm Value through Share Returns as an Intervening Variable. Based on the purchasing power parity theory, a given currency unit should have the same purchasing power in all countries (Spurr, 2019). Put another way, the relative prices in two countries should be reflected in the nominal exchange rate between their currencies.

Currency depreciation is consequently more likely in countries with high inflation, while currency appreciation is possible in countries with low inflation. Inflation erodes the purchasing power of a currency, causing its value to decline over time. When inflation is high, individuals and businesses lose confidence in the currency's stability, reducing demand for it in the international market. Consequently, the currency's exchange rate decreases, and its value depreciates relative to stronger currencies. Conversely, currency appreciation is a common outcome in countries where inflation remains low and stable. Low inflation preserves the currency's value, making it an attractive choice for investors and traders.

The stability of prices and the retained purchasing power of the currency instil confidence in its long-term value, thereby increasing its demand. This heightened demand can drive the currency's exchange rate higher, resulting in appreciation compared to other currencies. Exchange rates impact Firm value via stock returns as an intervening variable, as shown by research from several authors, including (Elfiswandi et al., 2020); (Ihsan et

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al., 2018). Exchange rates have an effect on firm value via the stock market's returns, so it follows that:

H6: Exchange Rates affect Firm Value through Stock Returns as an Intervening variable.

METHODS

The mining companies trading on the IDX in 2022 constitute the sample population. The Saturated Sample method/Census Method is used to determine the sample size, whereby the entire population is randomly selected as the sample (Ghozali, 2019). This strategy was adopted because the IDX features 62 mining companies trading on its market.

Changes in Interest Rates. Interest rate changes are used to ctolcalculatematic risk in the APT model. The formula used is as follows:

Intereset rate = Intereset rate $_{ratet}$ – Intereset rate $_{ratet-1}$ ..... (1)

Changes in the Inflation Rate. The inflation rate is used as a systematic risk calculation of inflation in the APT model. The formula used is as follows:

Inflation rate = $Inflation_t - Inflation_{t-1}$ .....(2)

Exchange Rate Changes. Changes in the Rupiah Exchange Rate against the Dollar are systematically used to calculate currency exchange rate risk in the APT model. The formula used is as follows:

Exchange Rate = Exchange Rate $_t$ – Exchange Rate $_{t-1}$ ..... (3)

Stock Return. Referring to (M. Harjoto et al., 2017), the formula for calculating stock returns is as follows:

$$R_{it} = \frac{P_{i_i} - P_{i_{-1}}}{P_{i_{-1}}} \quad \text{..... (4)}$$

The realized return is calculated by comparing the difference between the value of the company's shares in period t (P_it) with the value of shares in the previous period, precisely period t-1 (P_(it-1)). The result is then divided by the value of shares in period t-1 (P_(it-1)). In other words, this formula quantifies the change in stock value from the previous period relative to the stock value in period t-1, providing insight into the performance of the company's stock during that period.

The value of the company. The worth of a business is equal to the price at which its shares can be bought and sold on the stock market. The formula for calculating company value is as follows:

$$\text{Tobin's Q} = \frac{(M \quad +B \quad) - B}{B} \quad \text{..... (5)}$$

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Tobin's Q formula is calculated by taking the difference between the market value of all equity (MVE) and the book value of total assets (BVA) and then dividing the result by the book value of equity (BVE). In this formula, MVE represents the market value reflected in the company's stock price, while BVA is the value of total assets recorded in the financial statements. On the other hand, BVE represents the value of equity recorded in the company's books.

Structural Equation Modeling (SEM) analysis was performed to decipher the data in this research. Intelligent PLS software will be used to manage the data in this investigation. The limitations of the regression technique can be bypassed by using structural equation modelling (SEM) (Hair et al., 2021).

The choice of Structural Equation Modeling (SEM) for data analysis in the context of secondary data, despite the availability of software like EViews or Stata, is based on several scientific considerations:

Complex Relationships: SEM is ideal for studying complex relationships among multiple variables simultaneously, making it suitable for secondary data involving intricate structural connections (Sandoval & Ramos-Diaz, 2018).

Model Specification: SEM allows researchers to specify and test comprehensive theoretical models with observed and latent variables, accommodating complex structural relationships.

Measurement Error Handling: SEM can explicitly account for measurement error, a common issue in secondary data, leading to more accurate parameter estimates.

Confirmatory Analysis: SEM is well-suited for confirmatory analysis, where researchers aim to test and validate existing theories or models, a common objective when working with secondary data.

Multivariate Analysis: SEM enables the simultaneous analysis of relationships among multiple variables, which is valuable for studying complex phenomena in secondary data.

Model Fit Assessment: SEM provides robust tools for assessing how well the model fits the data, ensuring it accurately represents underlying relationships.

Handling Missing Data: SEM offers methods for effectively handling missing data, a common challenge in secondary datasets (El-Sheikh et al., 2017).

While EViews and Stata are powerful statistical software packages, their primary focus is on traditional econometric analysis and regression modelling. On the other hand, SEM is specifically designed to address the complexities of structural relationships and latent constructs in a way that aligns with theoretical models, making it a suitable choice for specific research questions.

RESULTS

General Description Of The Research Object. The Indonesia Stock Exchange (IDX) will have a total of 62 mining businesses listed on its exchange by the year 2022. During the index period that was utilized in this study, numerous different companies had to be removed from the sample since they were unable to meet the criteria that had been established. The final number of businesses that served as a part of the study's sample was sixty, all listed during the same time frame in 2022. It had provided the necessary data for

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the investigation. As a result, the samples for this study totalled sixty and were collected from sixty companies listed on the Indonesian Stock Exchange in sequential order.

Descriptive Statistics. After the 60 data sets have been analyzed, the next step is to process the descriptive statistical data of the research variables. **Table 1** displays the results of applying processing to the descriptive statistical data of the study variables.

Table 1. Descriptive Statistics Result

Description	Interest Rate	Inflation	Exchange Rate	Stock Return	Firm Value
Min	0.000	0.006	0.057	0.001	0.088
Max	0.842	0.643	0.873	0.424	0.374
Mean	0.085	0.288	0.455	0.059	0.182
Std.Dev	0.166	0.164	0.215	0.085	0.060

Source: Processed Data, PLS 4.0 (2022)

Table 1 shows that the interest rate variable has a minimum value of 0.000, a maximum value of 0.842, an average of 0.085, and a standard deviation of 0.166. The inflation variable, on the other hand, exhibits a minimum value of 0.006, a maximum value of 0.643, an average of 0.288, and a standard deviation of 0.164. Similarly, the exchange rate variable ranges from a minimum of 0.057 to a maximum of 0.873, with an average of 0.455 and a standard deviation of 0.215. The stock return variable has a minimum value of 0.001, a maximum value of 0.424, an average of 0.059, and a standard deviation of 0.085. Meanwhile, the firm value variable has a minimum value of 0.088, a maximum value of 0.374, an average of 0.182, and a standard deviation of 0.060.

Validity Test. In the test of discriminant validity, the cross-loading value is utilized. If the indicator has the highest cross-loading value on the variable, its discriminant validity is high. The value of each study variable's cross-loading is shown in **Table 2.**

Table 2. Discriminant Validity

Variable	Cross Loading Value	R_{table}	Description
Interest Rate	0.706	0.266	Valid
Inflation	0.646	0.266	Valid
Exchange Rate	0.788	0.266	Valid
Stock Return	0.749	0.266	Valid
Firm Value	0.848	0.266	Valid

Source: Processed Data, PLS 4.0 (2022)

Each indication in the research variable has a cross-loading value greater than the R table, as seen in **Table 2**. Based on the findings, conclusions about the discriminant validity of the variables utilized in this study's variable compilation can be drawn.

Reliability Test. If the Cronbach alpha value is more than 0.700, then the above reliability test utilizing the composite reliability can be considered reliable. Each study variable's Cronbach alpha is shown in **Table 3**.

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Table 3. Reliability Test Result

Variable	*Cronbach Alpha*
Interest Rate	1.000
Inflation	1.000
Exchange Rate	1.000
Stock Return	1.000
Firm Value	1.000

Source: Processed Data, PLS 4.0 (2022)

Cronbach's alpha values for all research variables are greater than 0.700, as shown in **Table 3**. These findings suggest that the Cronbach alpha value criteria have been met for all research variables, indicating that all variables are highly reliable.

Multicollinearity Test. The correlation between indicators was analyzed using a multicollinearity test. To use the VIF value to determine if multicollinearity exists between formative indicators. Values of the VIF between 5 and 10 indicate that multicollinearity is not present in the indicator. All of the study's variables were put through a multicollinearity test, and the findings are presented in **Table 4.**

Table 4. Variance Inflation Factors

Variable	VIF
Interest Rate	1.629
Inflation	1.679
Exchange Rate	1.591
Stock Return	1.002
Firm Value	1.114

Source: Processed Data, PLS 4.0 (2022)

As seen in **Table 4**, the VIF value for each variable is less than 10, indicating no multicollinearity.

***Partial Least Square* SmartPLS 4.0.** The processed data from this study may provide an answer to the research question. In this study, we tested our hypotheses by examining T-statistic and P-value values. The study hypothesis is accepted if the P-values are less than 0.050. The following are the findings from the study's hypothesis testing using the internal model:

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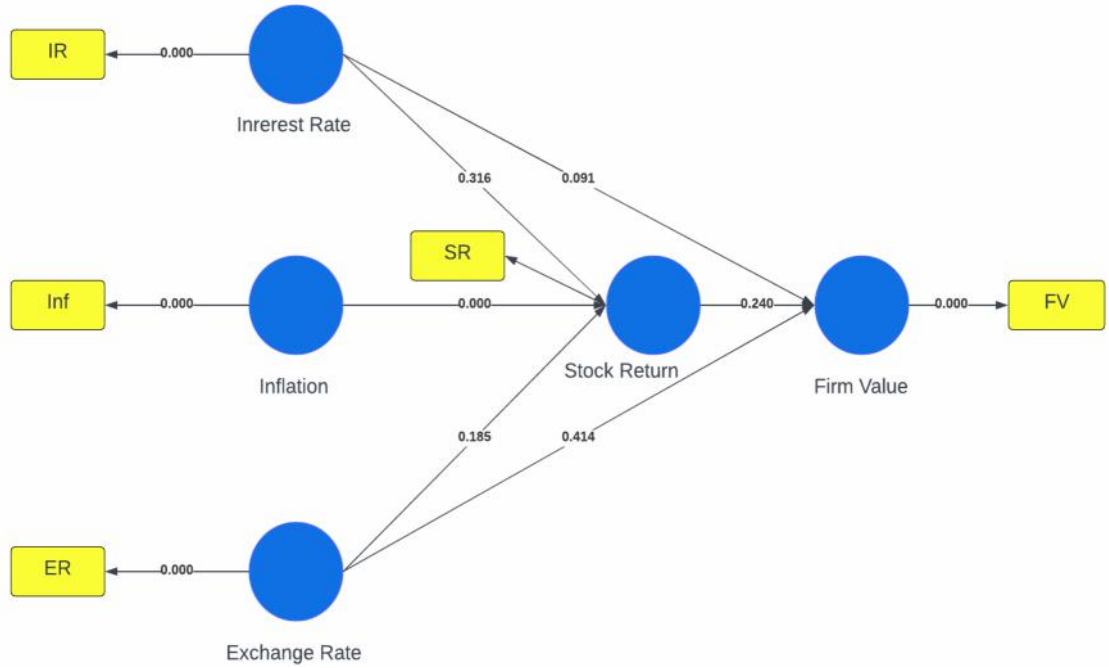

Figure 1. Result Test
Source: Processed Data, (2022)

As shown in **Figure 2**, the SmartPLS research hypothesis testing model results indicate that the relationship between the variables has direct and indirect impacts.

Results of Testing the Effect of Inter-Variables. Table 5 displays the findings that can be seen as a result of using SmartPLS to test the direct effect of the relationship that exists between the variables:

Table 5. Influence Between Variables

Variable	Path Coefficients	P-value	Result
Interest Rate – Firm Value	-0.027	0.000	Significant
Interest Rate – Stock Return	-0.052	0.000	Significant
Inflation – Firm Value	-0.011	0.000	Significant
Inflation – Stock Return	-0.004	0.000	Significant
Exchange Rate – Firm Value	0.064	0.000	Significant
Exchange Rate – Stock Return	0.037	0.000	Significant
Stock Return – Firm Value	0.023	0.000	Significant

Source: Processed Data, PLS 4.0 (2022)

The analysis results in **Table 5** reveal that the Interest Rate has a path coefficient of -0.027 with a p-value of 0.000, signifying a significant adverse effect on Firm Value and Stock Return. This suggests that an increase in interest rates will adversely impact firm value and stock returns. Secondly, inflation demonstrates a path coefficient of -0.011 with a p-value of 0.000, indicating a significant adverse effect on firm value and stock return. This implies that an increase in the inflation rate will negatively influence firm value and stock returns. Thirdly, the Exchange Rate exhibits a positive path coefficient of 0.064 with

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a p-value of 0.000, indicating a significant positive effect on firm value and stock returns. This implies that the local currency's appreciation will positively affect firm value and stock returns. Lastly, Stock Return shows a positive path coefficient of 0.023 with a p-value of 0.000, signifying a significant favourable influence on firm value. This indicates that an increase in stock returns will positively impact firm value.

DISCUSSION

Interest Rate Against Firm Value. Smartpls testing with a significance level 0.000 indicates that interest rates impact firm value. This suggests that when interest rates increase, the value of a firm also increases. One potential reason for this relationship is that the interest rate set by Bank Indonesia (BI) may affect the interest rates charged by commercial banks in Indonesia, resulting in higher selling prices. To combat inflation, the government may increase the BI interest rate, a benchmark for interest rates on loans and deposits at banks and financial institutions in Indonesia. Higher interest rates can lead people to keep their money in the bank, leading to a lower demand for cash and a higher demand for banking products. Several studies, including (Adnyana et al., 2017); (Andyani & Mustanda, 2018); (Choirunnisak, 2019); (Kusumaningtyas et al., 2021) have demonstrated the relationship between interest rates and firm value.

Interest rates positively and significantly affect firm value. Interest rates measure the cost of capital that companies must bear when utilizing funds from capital owners, typically in the form of loans. An increase in interest rates burdens investors, leading to higher interest expenses for the company. Investors are generally averse to investing at higher costs, which can hinder the development of investments. Consequently, many companies need help to sustain their operations, resulting in a decline in their overall performance. This decline in company performance can lead to a reduction in stock prices.

The findings of this study align with the theory that an increase in interest rates has a detrimental impact on issuers. Such an increase raises credit interest expenses and diminishes net income. A decrease in net income, in turn, results in a reduction in earnings per share, discouraging issuers from purchasing the company's shares. Thus, interest rates significantly influence the company's value (MBV).

The results of this study need to align with the theory proposed by Tandelilin (Tandelilin, 2017b), which posits that excessively high-interest rates will adversely affect the present value of a company's cash flow, rendering existing investment opportunities unattractive. This is primarily because elevated interest rates increase the company's interest expenses. This surge in interest expenses subsequently leads to diminished profits for the company. The reduced profitability of the company, in turn, negatively impacts its cash flow. A decrease in the company's cash flow affects the cash flow received by investors and diminishes investor interest in making investments. Consequently, this decline in investor interest can trigger a decrease in stock prices, ultimately reducing the company's overall value.

Inflation Against Firm Value. The research hypothesis was tested using a significance level of 0.000, and the results suggest that inflation impacts firm value. This implies that as inflation rises, so does the firm's value. A persistent and broad-based increase in the price of goods and services characterizes inflation. It is an economic phenomenon that involves a general and continuous increase in prices, driven by the

market's mechanisms and caused by various factors, including a rise in public expenditure, excess liquidity in the market that encourages consumption or speculation, and the efficient distribution of goods. The categorization of the overall inflation rate is the most important macroeconomic variable in economic activities carried out by economic actors, including the government, due to its potential to harm the structure of production costs and the level of welfare. Should a company face inflation, its value could be affected. If investors set aside some of their assets to invest in shares in the company, it will affect the profits that will be obtained later. This is in line with (Fikri et al., 2020); (Kasmir, 2021); (and Wardita et al., 2021), who discovered that Interest Rates affect Firm Value.

In general, inflation refers to a continuous increase in the prices of goods and services, indicating growth in a country's economy. The impact of inflation can be positive or negative, depending on its severity. When inflation is mild, it can have a positive effect by stimulating a more robust economy, leading to increased national income, a heightened work ethic, more significant savings, and increased investment.

Positive outcomes suggest that an increase in inflation is received positively by investors or contributes to an increase in firm value. However, statistically, this effect is relatively weak and not significant. This is because macroeconomic variables and internal factors, such as the company's expansion policies, influence the firm's value.

The presence of inflation signifies economic growth. The impact of inflation can be positive or negative, depending on its severity. It can have a favourable effect during mild inflation by promoting a healthier economy characterized by increased national income, a stronger work ethic, enhanced savings, and increased investments. Conversely, in the case of severe, uncontrolled inflation (hyperinflation), the economy can descend into chaos, resulting in sluggish economic activity. Due to rapidly rising prices, people may become disinclined to work, save, invest, or produce.

According to monetary theory (Devia & Fadli, 2022), inflation arises because society often seeks to live beyond its economic means, resulting in what is known as an inflationary gap. When total demand surpasses the available goods, prices tend to increase. Consequently, an increase in the actual quantity of money reduces the real interest rate, which boosts investment and output through the interest rate channel.

An increasing inflation rate can positively impact firm value and vice versa. This is primarily attributed to the relatively mild average inflation rate observed during the study period, which stimulates growth within the business sector, encouraging expanded production. By signalling theory, business growth is a positive signal to investors, prompting them to invest their funds in the capital market. The relationship between inflation and stock prices is unidirectional, meaning that as inflation rises, the prices of goods and services increase, enhancing company profits and stock prices. Investor behaviour anticipates relatively high stock returns in times of high inflation (in the normal category), leading to an increase in stock demand and, consequently, an increase in stock prices as a reflection of the company's value. Conversely, investors expect relatively lower returns when inflation is too low.

Exchange Rate Against Firm Value. Based on the Smartpls test results at a significance level of 0.000, it can be concluded that there is a significant relationship between Exchange Rate and Firm Value. This means that any increase in Exchange Rate can positively impact the company's value. Furthermore, it is commonly believed that the profit or loss on currency exchange differences is an accounting information that could

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influence the company's value and is typically included in the financial statements. It is believed that the value of a company and its earnings per share, cash flow, and income are affected by differences in exchange rates and accounting information disclosed in financial statements. Investors typically think about these three things before putting their money into a company. The following studies agree with this finding (Ratnasari et al., 2021; Setiyorini & Kartika, 2018) that exchange rates affect firm value.

The exchange rate is a factor that significantly influences firm value. Fluctuations in a country's currency exchange rate can directly impact a company's value, primarily if the company engages in international business. An increase in the exchange rate of the domestic currency relative to foreign currencies can boost the value of companies earning income in foreign currencies, as their earnings will translate into a higher domestic currency value. Conversely, a decrease in the exchange rate can negatively affect companies with liabilities denominated in foreign currencies, as their debt becomes more costly in the domestic currency. Additionally, exchange rate fluctuations can impact a company's competitiveness in the global market, potentially affecting its growth and profitability. Therefore, effective currency risk management and continuous monitoring of exchange rates are crucial for companies to maintain corporate value stability and enhance shareholder value.

When the domestic currency strengthens against foreign currencies, domestic companies benefit, particularly those that rely on imported raw materials, as they can procure them at lower prices, leading to increased profitability. Companies generating high profits send a positive signal to investors, indicating the potential for future earnings, which can attract more investors to purchase the company's shares. As more investors buy shares, share prices rise, influencing the company's overall value. This is supported by the Ministry of Industry's statement, revealing that one of the few growing sectors amidst the pandemic, aside from pharmaceuticals, is the manufacturing sector (Irawan & Widayati, 2022), highlighting the positive impact of currency fluctuations on specific industries.

Interest Rates on Company Value through Stock Returns. The findings obtained from putting the research hypothesis to the test with SmartPls indicate that interest rates impact a company's value as measured by its stock returns. This was determined by utilizing a significance level of 0.000. This indicates that the possibility of the company's value increasing due to stock returns will be increased proportionately to the interest rate's level. When calculating the minimum required rate of return on investment paper, investors typically use the interest rate as a proxy. When interest rates rise, the minimum rate of return that investors demand also rises, which has a subsequent impact on stock prices. An increase in interest rates may become a factor for investors who sell their holdings in stocks and switch to other investments, such as savings or deposits, due to the potential for higher returns on these alternative investments. Further studies (Adnyana et al., 2019); (Andyani & Mustanda, 2018); (Choirunnisak, 2019); (Kusumaningtyas et al., 2021) shows that interest rates affect firm value through stock returns.

When interest rates rise, investors typically prefer to allocate their funds to safer financial instruments, such as bonds, rather than stocks. This shift in preference can result in reduced demand for stocks, leading to a decline in the company's share price. Consequently, in such a scenario, the company's market value decreases as its share price falls.

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Moreover, elevated interest rates can elevate a company's cost of capital. As interest rates increase, companies must pay higher interest on their existing loans, which can erode their net profits. This, in turn, diminishes the company's overall value, as a company's value is often assessed based on anticipated future cash flows, and the additional costs resulting from high-interest rates can reduce the available cash flows.

However, there are situations in which rising interest rates can positively impact firm value. An increase in interest rates may signal a robust economy, bolstering investor confidence in the company's prospects. This heightened confidence can increase the company's share price as investors become more willing to invest their capital in the stock. Companies that generate income from interest or their investments may also benefit from higher interest rates.

Inflation Against Firm Value through Stock Returns. Based on the 0.000 significance level, the results of the research hypothesis tested with Smartpls suggest that inflation impacts firm value through stock returns. This implies that the increase in interest rates through stock returns would increase the firm's value. However, inflation can negatively affect stock returns since it increases the company's expenses, which may lead to a decline in profitability, especially if the costs are more significant than the company's revenue. This profit decline may discourage investors from investing in the company, leading to decreased stock prices. Therefore, it can be concluded that inflation rates hurt stock returns, which is consistent with the research findings of (Fikri et al., 2020) ;(Kasmir, 2021); (Suharyanto & Zaki, 2021); (Wardita et al., 2021) which indicate that interest rates affect firm value through stock returns.

Inflation exerts a complex impact on stock returns. Low or moderate inflation rates create favourable conditions for the stock market, fostering economic stability, increasing investor confidence, and promoting corporate growth. Conversely, high inflation rates can introduce uncertainty and instability to the stock market. This is due to reduced consumer purchasing power and the potential for a decline in corporate profits. However, companies that adjust their product prices in line with inflation may exhibit greater resilience to this negative impact.

Moreover, the influence of inflation can vary among industries and sectors within the economy. It depends on whether a sector can leverage price increases during inflationary periods or is more susceptible to high-cost pressures. A company's ability to adapt pricing strategies, the monetary and interest rate policies implemented by central banks, the timing of investments, and portfolio diversification also play pivotal roles in comprehending the dynamic relationship between inflation and stock returns. Therefore, continuous monitoring and analysis of the economic situation are crucial for making informed investment decisions.

The persistent trend of rising prices erodes consumer purchasing power. Inflation occurs when the general price of goods consistently increases over time, even if these increases are not simultaneous across all sectors. High inflation reduces the actual income earned by investors from their investments. Conversely, decreasing a country's inflation rate signals positive news for investors, as it mitigates the risks associated with reduced purchasing power and real income.

Exchange Rate Against Firm Value through Stock Return. The Smartpls test results indicate that the Exchange Rate significantly affects Firm Value through Stock Returns at a significance level 0.000. This means that as the Exchange Rate increases, the

company's value, as measured by Stock Returns, also increases. A decline in the domestic currency's value relative to other currencies can lead to an increase in exports and, if demand in the international market is elastic, can increase the company's profitability and Stock Returns. This finding is consistent with previous research by (Ratnasari et al., 2021) (Setiyorini & Kartika, 2018), in line with this finding that Exchange Rates affect Firm Value through Stock Returns.

Exchange rates are a crucial factor that significantly impacts companies' financial performance, especially those in global markets. Their relationship with firm value can be elucidated through their influence on a company's stock returns. Fluctuating exchange rates can substantially influence firm value because alterations in exchange rates can affect the valuation of a company's assets, liabilities, and earnings. When the local currency weakens against foreign currencies, it can enhance the value of exports and revenues for companies engaged in international transactions, thereby bolstering the company's performance and the value of its shares. Conversely, when the local currency strengthens, exposure to foreign currencies can lead to a decline in the company's earnings and value.

Furthermore, the impact of exchange rates on stock returns is closely tied to firms' hedging strategies. Companies frequently employ hedging tactics to mitigate risks associated with fluctuations in exchange rates. Effective foreign currency risk management through hedging can reduce stock return volatility and maintain the stability of the firm's value. Conversely, when companies falter in managing foreign currency risk, fluctuations in exchange rates can result in significant losses, manifesting as reduced stock returns.

Hence, exchange rates play a multifaceted role in influencing firm value through stock returns. Their impact hinges on several factors, including the company's exposure to foreign currencies, its competence in managing foreign currency risk, and prevailing global market conditions. Consequently, firm management should understand the implications of exchange rates and implement appropriate risk management measures to minimize potential losses and enhance firm value by achieving more stable stock returns.

Managerial Implications. When interest rates increase, firm value also increases. This finding implies that managers should closely monitor interest rate movements, especially those set by regulatory bodies such as Bank Indonesia (BI), as they can impact the interest rates charged by commercial banks. Higher interest rates can lead to higher selling prices, positively affecting firm value. Therefore, managers should consider the potential impact of interest rate changes on pricing strategies and overall financial performance.

When inflation increases, firm value tends to increase. Managers should be aware of the potential consequences of inflation on the firm's expenses and profitability. They need to implement strategies to mitigate the negative impact of inflation, such as controlling costs and adjusting pricing strategies to maintain profitability. Additionally, managers should communicate these strategies to investors to maintain investor confidence in the face of inflationary pressures.

An increase in the exchange rate impacted firm value positively, mainly through stock returns. Managers should pay attention to currency exchange rate movements, which can affect the firm's profitability, especially in international markets. This suggests that firms involved in international trade should implement effective currency risk management strategies to capitalize on favourable exchange rate movements and protect against adverse exchange rate movements.

Furthermore, this study emphasizes the importance of accounting information related to currency exchange rate differences. Managers should ensure that this information is accurately reported in the financial statements, as it can potentially affect the firm's value. Investors typically consider factors such as earnings per share, cash flow, and revenue when making investment decisions, and exchange rate fluctuations can influence these metrics. Clear and transparent financial reporting practices can increase investor confidence and positively affect company valuation.

CONCLUSION

The study findings suggest that the mining industry in Indonesia is significantly affected by macroeconomic factors, particularly interest rates, inflation, and exchange rates. The uncertain global economic condition has impacted all mining companies listed on the Indonesia Stock Exchange (IDX), resulting in a decline in stock returns and business value. The negative relationship between interest rates and inflation has negatively affected stock returns and business value. On the other hand, a positive and significant effect on stock returns and business value is observed due to the increase in the rupiah value. The study concludes that higher stock returns can increase the value of mining companies listed on the Indonesia Stock Exchange (IDX). The researcher also assumes that market sentiment looks at company performance, with stock returns used as a proxy.

Expanding the sample criteria to include other manufacturing companies listed on the Indonesia Stock Exchange (IDX) is a good suggestion, as it can provide a more comprehensive understanding of how macroeconomic factors affect firm value with stock returns as an intervening variable. In addition, extending the research period to multiple years can also provide a better understanding of the long-term impact of macroeconomic factors on firm value.

Furthermore, future studies may consider examining other intervening variables besides stock returns, such as earnings per share or return on assets, to provide a more nuanced understanding of the relationship between macroeconomic factors and firm value. Additionally, the study could be expanded to include a comparison of mining companies in Indonesia with those in other countries to gain insights into how different macroeconomic factors impact firm value across different contexts.

Overall, this research provides a valuable contribution to the literature on the relationship between macroeconomic factors and firm value, and its practical implications can benefit investors, policymakers, and other stakeholders in the Indonesian mining industry.

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