The Influence of Macroeconomic Factors on The Stock Returns of Energy Sector in Indonesia Stock Exchange

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Abstract. This research aims to analyze the influence of macroeconomic variables, which include inflation rates, interest rates, changes in exchange rates, and changes in commodity prices such as crude oil prices, coal prices, and gold prices, on energy sector stock returns as measured using the percentage change in stock prices. The analysis technique used is panel data regression with a random effect model. Partial research results show that the inflation rate and changes in commodity prices have a positive effect on stock returns in the energy sector. Meanwhile, interest rates and changes in exchange rates have a negative effect. In this study, dummy data was added because, throughout the research period, there was an economic slowdown due to the COVID-19 pandemic, which affected the decline in stock returns in the energy sector. Empirically, these findings confirm that macroeconomic conditions influence the stock market, and practically, these findings imply that investors must be more careful in managing their portfolios, and the government must always take strategic measures to maintain economic stability.

Keywords: *Inflation, interest rate, exchange rate, oil price, coal price, gold price, and stock returns of energy sectors*.

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1 INTRODUCTION

The capital market has an important role as a benchmark for a country's economic progress. Macroeconomics is one of the indicators that needs to be considered when investing in the capital market. Investors need to understand the macroeconomic conditions of a country as a consideration in making investment decisions, especially in the stock market [1].

Based on the Indonesian Bank report (2022), the increasing risks involving the global economy in 2022 are due to the conflict between Russia and Ukraine, which poses challenges to the national economy; in general, there are five new problems: (1) Global economic growth is diminishing in parallel with rising political fragmentation, while the likelihood of a recession in the United States and Europe is also increasing; (2) Inflation has increased very strongly in developed countries due to disruptions in the supply of energy and food commodities; (3) The benchmark interest rate for global monetary policy has increased sharply and is predicted to occur over a long period in response to the sharp increase in inflation, such as what happened in the Fed Funds Rate (FFR); (4) The US dollar / reserve currency strengthened sharply in line with the increase in FFR and global financial market uncertainty, thereby putting pressure on many national currencies, including the Indonesian Rupiah (IDR); and (5) The cash is The King phenomenon also occurs in line with global investors' high-risk perception, causing investors to withdraw their funds from developing countries, including Indonesia, to investment instruments that are seen as safer, more liquid, and closer to cash.

It is important to be aware of the impact of global economic conditions and to respond quickly and appropriately, because if they continue, there will be a risk of triggering stagflation or even a recession, resulting in pressure on the national economy.

The condition of the Indonesian economy in 2022, when viewed from the perspective of economic growth, has increased compared to 2021, namely 5.31%. The export sector of goods and services components at 16.28% and the transportation sector at 19.87% both had an impact on this. Due to disruptions in the food supply, fuel adjustment laws, and rising public demand amid improving COVID-19 pandemic conditions, the inflation rate increased to 5.51% at the end of 2022 compared to the end of 2021. To control the rate of inflation and the weakening trend in the global economy, Bank Indonesia raised the interest rate (BI rate) five times in the second semester of 2022 to 5.50% in order to maintain core inflation at around 3.0+1%. The

IDR exchange rate stability policy is also the focus of the government to manage the inflation of imported goods and overcome the impact of the strengthening of the USD on global market uncertainty. At the end of 2022, the IDR exchange rate weakened by 9.30% to Rp. 15,810. As a result of the global economic turmoil, the Indonesian banking monetary authority is concerned that the "Cash is the King" phenomenon will occur because of the public's perception that cash has greater value than other finance.

According to the Financial Services Authority, at the end of 2022 the Composite Stock Price Index (IHSG) increased by 4.09% yoy to IDR 6,850.62; this achievement was lower than in 2021, which was 10.08% yoy. The decline in the JCI at the end of 2022 was influenced by the weakening of several sectors, such as the technology sector by -42.61% and the infrastructure sector by -9.45%. On the other hand, the JCI benefited from the energy sector's significant strengthening, which was 100.5% compared to other sectoral indices.

Energy commodity prices in 2022 will experience a significant downward trend due to a decreasing supply of energy commodities due to the impact of the war between Russia and Ukraine, which resulted in an embargo. The world crude oil price reached

$80.47/Bbl, experiencing a significant increase of 66% since Q4 2020, while the price of coal as an alternative to replace the shortage of crude oil experienced a very significant increase of 402% since 2020, namely $404.25/MT.

In the world of investment, investors often use gold as an instrument of choice as a hedging tool to protect their wealth when they are worried about economic uncertainty. The gold commodity has a correlation with risky investment instruments such as the money market, according to [2]. If we look at the price of gold in 2020, it reached its highest point, namely $1,896/T.oz due to instability in the world economy due to the COVID-19 pandemic, and at the end of 2022, it showed an increase, namely 1,927/T.oz.

Before deciding to invest in the stock market, investors need to consider macroeconomic factors as indicators because they have a gradual and long-term impact on company performance. On the other hand, changes in macroeconomic conditions have an immediate impact on share value due to the rapid response of investors, who immediately make decisions to buy, sell, or hold the relevant shares. Therefore, share prices adjust more quickly to changes in macroeconomic variables compared to the performance of the company concerned, according to [3].

According to [4] in the long term, inflation has a negative impact on stock prices in the U.S., while in the short term, inflation has no effect except for the consumption sector index. Meanwhile, according to [5] the inflation rate has no influence on the IHSG. Meanwhile, the exchange rate has a negative effect on the IHSG.

According to [6], the exchange rate has a positive influence on stock prices, except for interest. Meanwhile, according to [7] exchange rates and interest rates have a significant negative impact on the stock market on the Karachi stock exchange in the long term, while in the short term, interest rates have no effect except for the exchange rate, which has a negative impact. Meanwhile, according to [8] exchange rate fluctuations have a significant impact on the Swedish stock market, but changes in interest rates do not have a significant impact.

According to [9] before including global commodity price variables, the RMB exchange rate does not show any impact on stock prices in China. However, after the global commodity price variable is included, the RMB exchange rate shows a negative influence on stock prices in China. Apart from that, fluctuations in global commodity prices also have a negative impact on the value of shares in China. Meanwhile, according to [10] crude oil and coal prices have a positive impact on stock returns, whereas the exchange rate shows a negative impact. This opinion is not in line with the claim of 'Bai et al., (2021) that crude oil prices do not have a direct impact on the stock market but impact U.S. stocks through indirect transmission means.

According to [12] the price of gold has a major influence on the bond market and stock market, especially when negative fluctuations in the stock market result in an increase in the price of gold. Meanwhile, according to [13] the relationship between gold prices and the stock market on the Frankfurt Stock Exchange varies throughout different time periods. Before the financial crisis, there was a positive correlation; however, during the financial crisis, the correlation became negative.

Considering that there are still differences of opinion from several previous studies, the author aims to conduct research by quantifying the impact of macroeconomic variables such as inflation rates, interest rates, exchange rates, and changes in commodity prices such as crude oil, coal, and gold prices on stock returns. Private companies in the energy sector listed on the Indonesia Stock Exchange, measured based on the percentage of fluctuations in their share prices during the research period from 2018 to 2022, were chosen as objects of observation because the energy sector index showed very significant strengthening compared to other sectoral indices amidst current global economic conditions. The energy sector is experiencing a slowdown in the rate of economic growth, which indicates a correlation with rising commodity prices.

2 LITERATURE REVIEW

2.1 The Influence of Macroeconomic Factors on Stock Returns

The results of several previous studies, such as [4] argue that inflation in the long term has a negative effect on stock prices in the U.S., and inflation in the short term has no effect on stock prices. This is because in the long term there is high inflation. As a result of economic uncertainty, which has had an impact on the economic crisis, investors are more careful in making investment decisions. Meanwhile, in the short term, inflation generally does not influence stock prices, except for the consumption sector index. This is because inflation reduces consumer spending power, leading to a decline in sales and earnings for companies in the consumption sector.

According to [14] the stock market in Pakistan saw a negative impact from inflation between January 2005 and December 2010. As inflation rose, the money supply expanded, leading to a decline in the purchasing power of money. Investors feel that if the value of their investment decreases, they tend to look for investments that can protect the value of their assets, such as gold or fixed-income financial instruments that provide high returns at that time compared to the stock market.

Some contend that interest rates exert a negative impact on the Dow Jones and S&P500 indices in the American stock market [14]. This assertion was substantiated during the time frame spanning from Q4 2010 to Q1 2011. In response to the rise in interest rates, investors opted for more conservative investments, driven by their assessment of the broader economic climate. Conversely, from Q3 2011 to Q2 2013, the economic conditions in the U.S. were deemed favorable. The stock market has increased while interest rates have decreased because investors prefer investment instruments that can provide high returns.

Long-term interest rates exert a negative impact on the Karachi Stock Exchange [7]. This is due to the consistent decrease in interest rates observed in 2016, which prompted investors to allocate their surplus capital to the equity market, deemed more lucrative than earning interest from a bank.

According to [8] the volatility of the Swedish stock market is adversely affected by exchange rates, as currency devaluation in Sweden has a unidirectional influence on the stock prices of companies engaged in international trade.

[7] states that fluctuations in currency rates have a pronounced negative impact on the stock market, both in the short and long run. This is primarily because most of the companies listed on the Karachi Stock currency are closely tied to international commerce, this corresponds with the opinion of [16] whereby fluctuations in exchange rates have a negative effect on the LQ45 stock price index in Indonesia. This is because the depreciation or appreciation of the IDR exchange rate directly affects the stock prices of companies involved in exporting and importing. Consequently, the strength or weakness of the currency can significantly influence the stock prices of the LQ45 index, to ensure currency stability, it is imperative for Bank Indonesia to implement appropriate policies.

According to [9] the stock market in China is not affected by the RMB exchange rate before adding the global commodity price variable, but after adding the global commodity price variable, the RMB exchange rate appears to have a negative impact on the China stock market, because the market commodities in China still prioritize foreign trade.

2.2 The Influence of Commodity Price Changes on Stock Returns

The results of several previous studies such as [17] contend that fluctuations in the price of individual commodities exert a positive impact on the stock market in Thailand because the commodity market depends on the extent to which the country is an exporter or importer of commodities and how important the role of commodities is on investor portfolios and the economy in that country.

[9] argued that global commodity prices have a negative effect on stock prices in China because China is an import country, especially for the energy commodity market, where Chinese enterprises face significant manufacturing expenses due to a surge in energy commodity prices resulting in a sharp decline in company profits and an impact on its stock price.

[8] discovered that the rise in oil prices had a favorable impact on the volatility of the Swedish stock market. This was due to a surge in exports, leading to enhanced profitability and anticipated cash flows for corporations. Consequently, this influenced an upward trajectory in their stock prices. Crude oil prices might be considered a determinant of stock prices. If a country is a producer or consumer of crude oil, an increase in crude oil prices will negatively affect the stock prices of companies in an importing country, while positively impacting the stock prices of companies in an exporting country.

This is in accordance with the opinion of [17] who believes that changes in crude oil prices have a positive impact on the Thailand stock market because the influence of the commodity market in Thailand is oriented towards export trade, so the role of the commodity market in Thailand has an impact on investor portfolios and the country's economy.

Meanwhile, according to [11] crude oil prices indirectly affect the U.S. stock market, but crude oil prices can influence corporate earnings and interest rates by influencing the Consumer Price Index (CPI) and Industrial Production Index (IPI), thereby providing an indirect relationship between crude oil prices and the performance of the U.S. stock market.

According to [18] it can be asserted with a 95% confidence level that there is a positive correlation between coal prices and coal stock prices. This is because a high demand for coal indicates strong performance in the coal business, which in turn leads to an increase in stock prices for companies in the sector.

[10] suggests that coal prices exert a significant and positive impact on the optimal portfolio returns, as seen by the rise in stock prices of companies in the mining sector. This occurs because of the high demand for coal from China, which needs additional supplies due to tightening domestic production; subsequently, this surge in demand results in a rise in coal prices, thereby affecting the stock price of companies operating within that industry.

According to [19], the impact of gold prices on the stock market in Pakistan is significant. When inflation occurs, investors diversify their investment portfolio in gold to protect the value of their money. After conditions stabilized, investors took profits on gold and shifted to the stock market in Pakistan.

[13] stated that the correlation between gold prices and the stock market on the Frankfurt Stock Exchange shows different results in each period. Before the financial crisis occurred, there was a positive correlation, because the increase in gold prices before the crisis occurred was considered by investors to be less attractive and the economic conditions were still relatively stable, so investors preferred to invest in instruments that could provide high returns. But when the crisis occurred, the correlation became negative because investors preferred to invest in risk-free instruments to protect their assets.

2.3 The Impact of Covid-19 Pandemic on Stock Returns

The results of several previous studies such as [20] show that the increase in confirmed cases of COVID-19 every day has had an impact on the decline and fall of financial markets in Europe, especially Italy, which is the country worst affected. COVID-19 has been proven to cause global economic disruption, which has resulted in an economic downturn with a detrimental impact on financial markets, including the stock market, so that investors are more careful in managing their portfolios.

According to [21] the daily rise in the number of confirmed cases and fatalities caused by the COVID-19 pandemic has a notable adverse impact on stock returns for all companies listed on the Chinese stock market, with the exception of those operating in the technology and pharmaceutical sectors. Investors are more careful about companies outside the technology and pharmaceutical sectors that show positive performance.

3 RESEARCH METHOD

This research is descriptive-quantitative, with the main aim being to explain the correlation between the independent variable and the dependent variable.

. 3 1 Data

In this research, data collection on each variable was obtained from official sites such as www.idx.co.id, www.bi.go.id, www.bps.go.id, www.investing.com, and www.finance.yahoo.com.

This research uses individual company analysis units to be used as research objects. The independent variables used are macroeconomic factors, which include the inflation rate, interest rate (BI rate), changes in exchange rates (USD/IDR), changes in crude oil prices, changes in coal prices, and changes in gold prices as indicators. Meanwhile, the dependent variable used is stock returns from 48 energy sector companies listed on the Indonesia Stock Exchange from 2018 to 2022, using an indicator of the percentage change in share prices.

3.2 Empirical Model

The empirical model in this research is as follows:

$$SR_{it} = a + b_1 Inf_{it} + b_2 IR_{it} + b_3 ER_{it} + b_4 CoP_{it} + b_5 CP_{it} + b_6 GP_{it} + E$$

Variable	Definition	Indicator
k Returns (SR)	Stock returns are the rate of return or profit received by an investor from shares traded on the capital market.	$P = \frac{(P1 - P0)}{P0}$.
Inflation (Inf)	Inflation refers to a continuous increase in the prices of goods and services over a certain period.	Inflation Rate in the t period
rest Rate (IR)	The interest rate is one of the monetary policies used by the central bank to stabilize or control the relatively high rate of inflation.	rest rate (BI rate) in the t period
hange Rate (ER)	The exchange rate is the reference value or price for exchange between two currencies, the movements of which are used as an indicator of macroeconomic conditions.	Changes of exchange rate (USD/IDR) in the t period

e Oil Price (CoP)	Crude oil prices are determined by transactions that are influenced by the level of demand and supply in the commodity market at a certain time.	Changes of crude oil price in the t period
Coal Price (CP)	Coal prices are determined by transactions that are influenced by the level of demand and supply in the commodity market at a certain time.	nges of coal price in the t period
Gold Price (GP)	Gold prices are determined by transactions that are influenced by the level of demand and supply in the commodity market at a certain time.	Changes of gold price in the t period

4 RESULT AND DISCUSSION

Based on the results of the descriptive test above, we can describe the distribution of data obtained from the period 2018 to 2022 as follows: The stock return variable shows a maximum value of 252% and a minimum value of -69%, with an average value of 2% and a standard deviation of 20%. The inflation rate variable shows a maximum value of 6% and a minimum value of 1%, with an average value of 3% and a standard deviation of 1%. The interest rate variable (BI rate) shows a maximum value of 6% and a minimum value of 3.5%, with an average value of 4.5% and a standard deviation of 0.9%. The exchange rate change variable (USD/IDR) shows a maximum value of 14% and a minimum value of -9%, with an average value of 0.2% and a standard deviation of 3%. The variable change in crude oil prices shows a maximum value of 88% and a minimum value of -54%, with an average value of 2% and a standard deviation of 17%. The coal price change variable has a maximum value of 31% and a minimum value of -32%, with an average value of 3% and a standard deviation of 12%. The gold price change variable shows a maximum value of 11% and a minimum value of -7%, with an average value of 0.6% and a standard deviation of 4%. Because from 2020 to 2022 there will be economic uncertainty due to the COVID-19 pandemic, the independent variable will be added to the COVID-19 dummy variable, which shows a maximum value of 100% and a minimum value of 0%, with an average value of 60% and a standard deviation of 49%, in Table 1.

Table 1. Descriptive Statistic Result

Variable	Observation	Mean	Maximum	Minimum	Std. Dev.
STOCK	2880	0.019260	2.517857	-0.690995	0.204543
INFLATION	2880	0.028057	0.059500	0.013200	0.011498
BI_RATE	2880	0.045000	0.060000	0.035000	0.009199
USD_IDR	2880	0.002660	0.136681	-0.090491	0.027294
OIL	2880	0.017914	0.883758	-0.542449	0.166024
COAL	2880	0.030452	0.313384	-0.319758	0.119874
GOLD	2880	0.006357	0.108959	-0.071634	0.038427
COVID*	2880	0.600000	1.000000	0.000000	0.489983

After testing the panel data regression model selection using the Chow test, Hausman test, and Lagrange multiplier (LM), the best model approach is to use the Random Effect Model (REM). Due to the large number of data samples, the normality test results demonstrate that the data is still normally distributed, while the multicollinearity test results indicate that there is no multicollinearity in the data.

Table 2. T Statistic Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.191519	0.037615	5.091567	0.0000
INFLATION	0.722128	0.366117	1.972396	0.0487
B_RATE	-4.023611	0.733683	-5.484128	0.0000
USD_IDR	-0.565177	0.155334	-3.638459	0.0003
OIL	0.066592	0.025303	2.631799	0.0085
COAL	0.087531	0.035661	2.454543	0.0142
GOLD	0.267469	0.107258	2.493694	0.0127
COVID*	-0.025855	0.012408	-2.083708	0.0373

Based on the results of hypothesis testing using the T-Statistics Test in accordance with Table 2 above, the following can be concluded:

The inflation rate shows a positive effect on stock returns of energy sector companies. When there is an increase in inflation, which results in a decrease in the value of money, investors expect to hedge by looking for higher returns in the stock market, especially the energy sector, which is showing positive performance rather than placing their money in banks or in financial instruments such as deposits or bonds that provide still relatively low returns. This opinion corresponds with that of [14]: as inflation rises, the quantity of money in circulation increases, leading to a decline in the purchasing power of money. Investors feel that if the value of their investment decreases, they tend to look for investments that can protect the value of their assets, such as gold or fixed income financial instruments that provide high returns at that time compared to the stock market.

The interest rates show a negative effect on stock returns of energy sector companies. When there is an increase in interest rates, investors prefer to invest in financial instruments such as deposits or bonds that promise higher returns with lower risk compared to energy sector shares that are showing weakness. As happened in 2019, when interest rates increased by 6%, the energy sector showed weakness. So, investors prefer to leave energy sector stocks and switch to financial instruments. This opinion agrees with [15]: when there is an increase in interest rates to maintain economic stability, investors switch to more defensive investments; on the other hand, when economic conditions are felt to be good, the U.S. stock market has increased while interest rates have decreased because investors prefer investment instruments that provide high returns.

The changes in exchange rates show a negative effect on stock returns of energy sector companies. When the IDR exchange rate weakens, it will have an impact on the cash flow and profits of companies in the energy sector that finance their operations using dollars. So, investors prefer to shift their investments to shares of other companies or other instruments to get higher returns. This opinion agrees with [7] whereby fluctuations in exchange rates, whether occurring over a long or short period of time, negatively impact the stock market. This is mostly since a significant number of companies engage in international commerce, influencing their business activities and ultimately harming their profitability.

The changes in crude oil prices show a positive effect on the stock returns of energy sector companies. When crude oil prices rise, this can be expected to have a positive impact on the income of crude oil exporting companies, so investors choose to allocate their funds to these companies to get high returns. This opinion corresponds with the view [8] that oil prices exert a positive impact on the Swedish stock market. Rising oil prices lead to more exports, hence impacting corporate profitability and contributing to an increase in stock prices.

The changes in coal prices show a positive effect on stock returns of energy sector companies. When there is an increase in coal prices, it is expected that this will have an impact on company revenues, especially coal exporting companies. So, investors expect that if the company's cash flow is positive, it will have an impact on the company's profits and influence the dividends that will be distributed. This opinion agrees with [18] whereby coal prices exert a favorable impact on the stock prices of companies operating in the coal sector. The strong demand for coal serves as an indicator of the robust performance of enterprises in this industry and contributes to the upward trajectory of their stock prices.

The changes in gold prices show a positive effect on stock returns of energy sector companies. When the price of gold rises, investors take profit on their investment portfolio in gold, and gain momentum by diversifying their investments in the energy sector stock market which is showing positive performance. This opinion agrees with [19], as the price of gold has a substantial impact on the stock market in Pakistan. When inflation occurs, investors diversify their investment portfolio in gold to protect the value of their money. After conditions stabilized, investors took profits on gold and shifted to the stock market in Pakistan.

The Covid-19 pandemic affected the decline in stock returns of energy sector companies. When the government implemented the Large-Scale Social Restrictions (PSBB) policy as an effort to overcome the surge in the Covid-19 pandemic, it had an impact on the operational performance of companies in all sectors, including energy sector companies, so that this was reflected in the performance of their shares. This opinion is in line with [20] that the increase in confirmed cases (Covid 19) has had an impact on decreasing the performance of financial markets and stock markets in Europe, especially Italy, as the country worst affected, which is a result of investors being more careful in managing their portfolios.

5 CONCLUSSION AND RECOMMENDATION

5.1 Conclusion

This study aims to analyze the stock market in the energy sector, specifically investigating the correlation between macroeconomic indicators and stock returns in this industry. Macroeconomic indicators encompass inflation rates, interest rates, currency rates, and fluctuations in commodity prices such as crude oil, coal, and gold. The stock return variable is determined by calculating the percentage change in the share prices of 48 energy sector companies that are listed on the Indonesian Stock Exchange.

The statistical test results show that all hypotheses show an influence on stock returns and inflation variables; oil prices, coal prices, and gold prices show a positive influence, while the interest rate, exchange rate, and dummy variables show a negative influence. So, it can be concluded that investors in investing also consider macroeconomic factors with the aim of seeking a high rate of return and considering a low level of risk. We can see that the performance of shares in energy sector companies shows a correlation with the increase in highly volatile energy commodity prices.

5.2 Recommendation

The results of the research recommend that capital market players need to consider the condition of macroeconomic factors before investing in the stock market, especially in the energy sector, because so far, energy sector stocks have shown to be closely related to macroeconomic factors such as inflation levels, interest rates, exchange rates, and especially price changes of commodities.

Furthermore, the results of the analysis provide theoretical implications, and empirically, these findings further strengthen the theory that changes in macroeconomic conditions can influence investors' perspectives on the stock market. So practically, these findings imply that the government must always adopt strategic policies to maintain economic stability.

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