Effects of Energy Price Fluctuations on Stock Return of Energy Companies in Indonesia: The Effect of Macroeconomic Variables and Subsidy Policy

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ABSTRACT	ARTICLE INFO
This study aims to analyze the effect of global energy price fluctuations, inflation, interest rates, exchange rates, and subsidy policies on stock returns of energy companies listed on the Indonesia Stock Exchange. The method used is panel data regression with the Fixed Effects Model (FEM) approach to capture unique characteristics between companies and simultaneous time variations. The results show that energy prices have a positive influence on stock returns, while inflation, interest rates, and exchange rates tend to have a negative impact. Energy subsidy policies also show a relevant relationship to the stock performance of energy companies. The findings provide insights for investors and policy makers in considering energy price dynamics and macroeconomic factors in investment strategies and energy sector policies in Indonesia.	 To cite this article (APA Style): Adhani, F., and Nurazi, R. (2025). Effects of Energy Price Fluctuations on Stock Return of Energy Companies in Indonesia: The Effect of Macroeconomic Variables and Subsidy Policy. *JASa : Jurnal Akuntansi, Audit dan Sistem Informasi Akuntansi*. Vol 9 (2), p.436-447. https://doi.org/10.36555/jasa.v9i2.2904

INTRODUCTION

One of the major concerns in the global economy in recent years has been the fluctuation of energy prices, and Indonesia is no exception. Volatile crude oil and coal prices create major challenges for companies in the energy sector. Changes in energy policy, including the removal or reduction of energy subsidies, further amplify the impact on the national economy as well as the capital markets. According to (Handayani et al., 2020), the energy subsidy reduction policy in Indonesia affects the economic balance, which can directly affect the stock prices of energy sector companies (Handayani et al., 2020). Therefore, in-depth research on the relationship between energy price fluctuations and stock performance is becoming increasingly relevant.

While many studies have explored the relationship between energy prices and economic growth, there is still a gap in understanding the combined effect of oil and coal price fluctuations with macroeconomic factors such as inflation, interest rates, and energy policy on the Indonesian energy sector stock market. Several studies highlight the need for a more comprehensive understanding of the impact of energy prices on the performance of energy companies, both in terms of earnings and market value (Robiyanto et al., 2019). This study aims to answer the following questions: How do fluctuations in oil and coal prices, coupled with changes in macroeconomic variables and energy subsidy policies, affect the stock performance of energy companies in Indonesia? This question is important

in the context of the need to formulate a sustainable investment strategy and energy policy in Indonesia.

Furthermore, this study aims to fill the gap of previous research by highlighting the need for a thorough analysis of the combined effects of various external factors on the energy sector. In previous literature, the effect of oil and coal price fluctuations on stock performance has been studied partially, without considering the simultaneous impact of macroeconomic variables and energy subsidy policies (Zahari & McLellan, 2023). Through a more comprehensive approach, this study is expected to provide new insights that are relevant to policy makers and investors. Energy price fluctuations are an important issue that affects the Indonesian economy at large. The energy sector has a strategic role in supporting economic growth, given its high dependence on fossil energy such as crude oil and coal. Erratic changes in energy prices can have significant impacts, both for businesses in the energy sector and for the national economy. Therefore, research on the impact of energy price fluctuations is crucial, especially in understanding how these changes affect the stock performance of energy companies.

The Indonesian government has made various changes to energy subsidies that directly impact domestic energy price stability, from 2019 to 2024. One important policy is the gradual removal of electricity subsidies for well-off household customers in 2020, as well as fuel oil (BBM) price adjustments that are influenced by fluctuations in world oil prices (Kementerian ESDM, 2020). This policy reflects the government's efforts to improve the efficiency of state budget allocations and encourage the use of more environmentally friendly energy. However, the policy also raises new challenges for energy sector companies that must adapt to an increasingly dynamic business environment (Handayani et al., 2020). For example, in 2022, the government raised the price of subsidized fuel in response to a surge in global oil prices due to international geopolitical instability (KESDM, 2022). This move directly affects the cost structure of energy companies, which in turn has the potential to affect their net profit as well as their stock market valuation. These fluctuations become even more complex when considered alongside macroeconomic variables such as inflation and interest rates that have also changed over the same period.

Previous research shows that energy price fluctuations can be one of the main determinants in the stock price movements of energy companies (Robiyanto et al., 2019). However, studies that integrate the combined impact of energy subsidy policies and macroeconomic factors on the energy sector are still rare in Indonesia. Therefore, this study has a high urgency to broaden the insights related to the mechanism of the influence of energy price fluctuations on the stock performance of energy sector companies. In this study, a panel data regression method is used that allows simultaneous analysis of data across time and between companies. This approach was chosen because it is able to capture the complexity of the relationship between variables and significant temporal variations. The data used includes energy price information, financial data of energy sector companies listed on the Indonesia Stock Exchange (IDX), as well as macroeconomic variables over a certain period. While several previous studies have shown significant effects of macroeconomic variables and energy subsidies, this study also aims to re-evaluate the strength of the relationship in the context of Indonesia's energy sector by considering global market fluctuations and national policy dynamics in the 2019–2024 period. Therefore, this study aims to empirically analyze the effect of energy price fluctuations, macroeconomic variables, and energy subsidy policies on the stock returns of energy companies listed on the IDX during the 2019–2024 period.

Arbitrage Pricing Theory (APT) introduced by Stephen Ross in 1976 is an asset valuation model that states that security returns can be explained by various systematic risk factors (Ross, 1976). Unlike the Capital Asset Pricing Model (CAPM) which only considers market risk, APT incorporates various economic variables, such as inflation, interest rates, and energy prices, as relevant risk factors. APT is particularly relevant in analyzing the relationship between energy price fluctuations and stock performance of

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energy companies in Indonesia, given that the sector is heavily influenced by macroeconomic variables as well as government policies, including energy subsidies. Previous research shows that the APT model is able to provide more accurate predictions for sectors that are highly affected by external risks, including energy commodity price fluctuations (Darsono et al., 2024). In the context of this study, APT can be applied to explain the effect of energy price fluctuations (oil and coal) on the stock performance of energy companies listed on the Indonesia Stock Exchange (IDX). Changes in energy prices as a significant external risk factor have a direct impact on energy companies' revenue, operating cost structure, and competitiveness in the market. Fluctuations in energy prices can also reflect global economic uncertainty, which in turn affects investor sentiment. n addition, Indonesia's energy subsidy policy, which has undergone significant changes over the 2019-2024 period, can also be included as an important variable in the APT framework. The government's subsidy policy adjustments, such as the phasing out of electricity subsidies in 2020 and fuel price adjustments in 2022 (KESDM, 2022), create energy price fluctuations that affect the domestic energy market balance.

Fluctuations in energy prices, especially crude oil, have a significant influence on stock returns in the energy sector. (Robiyanto et al., 2019) showed that rising oil prices due to energy subsidy adjustments increased the volatility of the Indonesian stock market. The findings also show how the stock market responds asymmetrically to changes in energy prices. Energy price increases tend to be responded more negatively due to concerns about inflation, increased operating costs, and potential interest rate hikes, which in turn suppresses the performance of stocks in non-energy sectors. Conversely, energy sectors, such as oil and gas exploration and production companies, may experience a surge in returns as their earnings increase with rising commodity prices. The impact of these fluctuations is not only determined by domestic factors but also influenced by global dynamics, such as OPEC policies and geopolitical tensions in oil-producing regions, which makes energy prices one of the important risk factors in equity investments.

Research shows that inflation has a complex influence on stock returns. (Putra et al., 2024) in their research found that inflation can increase investment risk which makes investors more cautious in their investment decisions, thus having an impact on the volatility of stock returns of companies listed on the Indonesia Stock Exchange. Meanwhile, another study by (Rahman & Mursalini, 2024) on the food and beverage sector showed that changes in inflation do not always have a significant effect on stock returns, which indicates that certain sectors may be more resistant to price fluctuations. Interest rates are often considered as one of the main macroeconomic indicators that affect stock returns. (Wahyu Umaryadi et al., 2021) found that rising interest rates have a negative impact on digital media stock returns in Indonesia, as higher interest rates increase the company's cost of capital. In contrast, research (Sari et al., 2024) shows that in some cases, the infrastructure sector is not significantly affected by changes in interest rates. Currency exchange rates have an important role in determining the competitiveness of companies involved in international trade. (Fahda Aulia & Angelica, 2024) found that fluctuations in the Rupiah exchange rate against foreign currencies have a significant impact on stock returns of non-oil and gas-based companies in Indonesia. This is confirmed in research conducted by (Haida et al., 2024) which shows that exchange rate appreciation can increase export competitiveness and stock returns in certain sectors. Energy subsidy policies can affect the cost structure of energy companies and ultimately their stock returns. Research by (Anwar et al., 2023) shows that the removal of fuel subsidies can trigger a decline in the profitability of energy companies in Indonesia, which in turn lowers their stock returns. This is reinforced by the findings of a study by (Agustina Putri et al., 2024) which states that the policy of reducing energy subsidies increases stock price volatility in the energy sector.

The hypotheses proposed are as follows:

H1: Energy prices have a positive effect on the returns of energy company stocks.

H2: Inflation has a negative effect on the stock returns of energy companies.

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H3: Interest rates have a negative effect on the stock returns of energy companies.
H4: Exchange rates have a significant effect on the stock returns of energy companies.
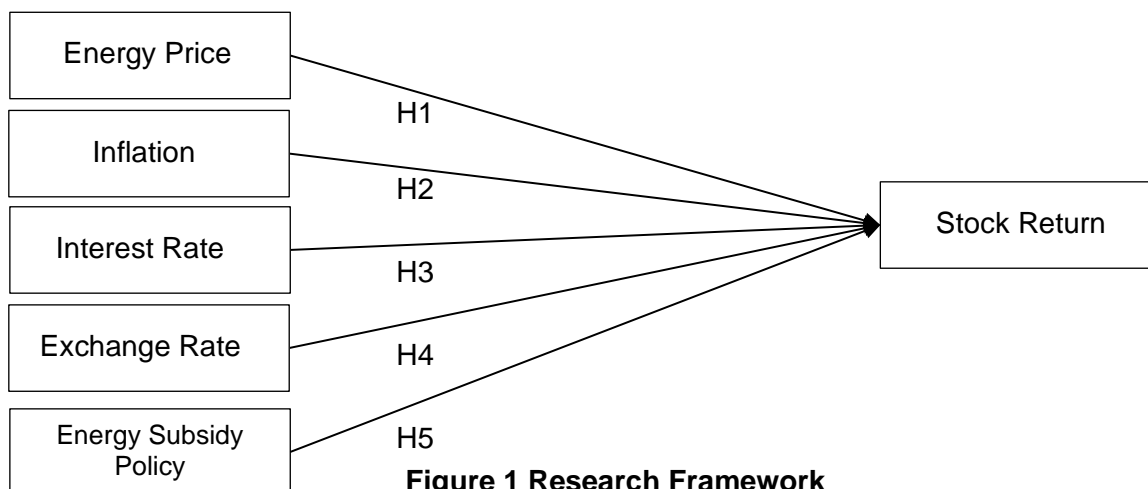H5: Energy subsidies have a negative impact on the stock returns of energy companies.

Figure 1 Research Framework
Source: Data processing by the author, (2025)

METHODS

This study uses a quantitative approach with a panel data regression analysis method, which allows testing the relationship between variables simultaneously both in terms of time (time series) and between entities (cross-sectional). The selection of the panel data method aims to accommodate the different characteristics of each company in the energy sector as well as the macroeconomic dynamics that take place during the period 2019 to 2024. In this context, the main model used is the Fixed Effects Model (FEM), as it is considered the most appropriate in capturing fixed heterogeneity between companies that cannot be observed directly. The FEM model also provides advantages in controlling for variables that are fixed and not explicitly measured, such as management structure, business strategy, or operational efficiency.

This study relies on secondary data obtained from various reliable sources. Financial data on energy companies is obtained from annual reports and financial statements published by the Indonesia Stock Exchange (IDX), while macroeconomic data such as inflation, interest rates, and exchange rates are sourced from Bank Indonesia and the Central Statistics Agency (Badan Pusat Statistik, 2019–2024). Information on global energy prices, such as crude oil and coal, was obtained from credible international institutions such as the Energy Information Administration (EIA). In addition, data on energy subsidies were obtained from policy documents published by the Ministry of Energy and Mineral Resources (MEMR) and reputable national economic media reports.

The sample selection was carried out purposively, taking into account the completeness of the data and the consistency of the company's financial statements during the study period. Of the entire population of energy companies listed on the IDX, only fifteen companies met the criteria for data eligibility and the availability of complete stock price information from 2019 to 2024. These companies are ADRO, MEDC, PGEO, ITMG, PTBA, ELSA, ENRG, DSSA, BUMI, HRUM, INDY, UNTR, TPIA, RAJA, and BRPT. The selection is based on the consideration that these companies are actively operating in the main energy subsectors and have high exposure to changes in energy prices and subsidy policies. The FEM panel regression model is formulated with the dependent variable being the stock return of energy companies, while the independent variables consist of global

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energy prices, inflation, benchmark interest rate (BI Rate), Rupiah exchange rate against the US Dollar, and total energy subsidies. The data is processed using EViews software to estimate the model and test the significance of the influence of each variable.

Stock Returns of Energy Companies

Stock return data is calculated from the percentage change in stock prices of energy companies listed on the Indonesia Stock Exchange (IDX, 2019–2024) and for year 2024 several from Yahoo Finance (Yahoo Finance, 2024), including companies such as PT Pertamina Geothermal Energy, PT Adaro Energy Tbk, and PT Medco Energi Internasional Tbk. The stock return calculation formula is:

$$Stock\ Price_{it} = \frac{Stock\ Price_{it} - Stock\ Price_{it-1}}{Stock\ Price_{it-1}} \times 100\%$$

Where is:
- i = specific company
- t = current year
- t−1 = Previous year
- $Stock\ Price_{it}$ = Stock Price at the end of t
  $Stock\ Price_{it-1}$ = Stock Price at the end of t-1

Global Energy Price Fluctuations

Energy price data in this study is not only limited to world crude oil prices, but also includes coal and natural gas prices, as they are the main commodities in the energy sector in Indonesia. Oil price data uses Brent Crude and West Texas Intermediate (WTI) obtained from the Energy Information Administration (EIA, 2019–2024) report and Organization of the Petroleum Exporting Countries (OPEC, 2019–2024) official website. Meanwhile, coal price data refers to the Reference Coal Price (HBA) published by Index Mundi the Commodity prices: Coal, natural gas, crude oil (Index Mundi, 2019–2024) and World Bank Commodity Markets (World Bank, 2024) report, and gas price data is obtained from official government publications and international energy market reports (Trading Economics, 2019–2024). These three types of energy reflect the condition of global energy price fluctuations that have a significant impact on the performance of energy companies in Indonesia. Changes in energy commodity prices not only reflect global supply and demand dynamics, but are also influenced by national energy policies, geopolitics, and the global energy transition towards renewable energy.

Inflation

Annual inflation data in Indonesia is taken from the official reports of the Central Bureau of Statistics (Badan Pusat Statistik, 2019–2024) as well as economic publications of Bank Indonesia and Association of Indonesian National Private Banks (Perbanas, 2020–2024). This variable is measured in percentage changes in the Consumer Price Index (CPI). Inflation is used in this study as an indicator of domestic macroeconomic conditions that can affect investor behavior and stock returns. A high inflation rate generally reflects increased price pressures that have the potential to reduce consumer purchasing power and increase the operating costs of companies, including energy sector companies. Conversely, controlled inflation indicates economic stability and creates a more conducive investment climate. Therefore, inflation is considered an important variable in analyzing the influence of macroeconomic factors on the performance of energy sector stocks.

Interest Rate

Interest rate data in this study uses the BI 7-Day Reverse Repo Rate, which is the main reference for Central Bank of Indonesia (Bank Indonesia, 2019–2024) monetary policy. This rate reflects the interest rate set by the central bank to commercial banks for

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short-term fund placement transactions, and is the main instrument in controlling liquidity and inflation in the economy.

Exchange Rate

Data on the exchange rate of the Rupiah against the United States Dollar (USD) in this study was obtained from official publications of Bank Indonesia and international financial sites such as Trading Economics (Trading Economics, 2019–2024). The exchange rate is used as one of the key macroeconomic variables because it has a direct impact on energy companies that operate in the global market or are dependent on imported and exported commodities. Fluctuations in exchange rates can affect production costs, export revenues and profitability, especially for companies that conduct transactions in foreign currencies. When the Rupiah weakens against the US Dollar, the cost of importing energy components or heavy equipment tends to increase, which can reduce profit margins. Conversely, companies that export energy products, such as coal or natural gas, can potentially benefit more from Rupiah depreciation. Therefore, exchange rate variables are an important factor in analyzing stock returns of the energy sector, given its sensitivity to global economic dynamics and dependence on international trade.

Energy Subsidy Policy

The energy subsidy policy variable in this study is represented in the form of a dummy variable, but not in the simple sense of a binary number to indicate only the presence or absence of subsidies. Instead, it is constructed based on the actual government subsidy policy data applicable to each of the main energy commodities-i.e. oil, coal and natural gas-for each year of the observation period. Information on changes or fluctuations in the subsidy policy was collected from the official reports of the Ministry of Energy and Mineral Resources (Kementerian ESDM RI, 2019–2024), the Ministry of Finance, and supported by publications from reputable national economic media.

The dummy takes the value of 1 when there is a reduction in energy subsidies, such as when the government reduces the allocation of subsidies to fuel oil, electricity, or gas-which generally results in higher energy prices and changes in the downstream cost structure. Conversely, the dummy takes the value 0 when there is no reduction, or when the subsidy policy is relatively stable or increased. This coding process is based on observations of policy dynamics that directly affect the energy sector, rather than general fluctuations in the subsidy budget. With this approach, the subsidy policy dummy variable is able to reflect the government's fiscal pressure or support for the energy sector during the study period. Changes in subsidies have a significant influence on the operating costs of energy companies and, indirectly, on the stock returns generated. Therefore, this variable plays an important role in the framework of the model that examines the influence of macroeconomic factors and fiscal policy on the performance of energy sector stocks in Indonesia.

The Fixed Effects Model (FEM) panel data regression model used in this study is as follows:

$$Y_{it} = \alpha_i + \beta_1 Stock\ Price_{it} + \beta_2 Inflation_{it} + \beta_3 Interest\ Rate_{it} + \beta_4 Exchange\ Rate_{it} + \beta_5 Subsidy\ Policy_{it} + \varepsilon_{it}$$

Keterangan:
- Y_{it} *is the stock return of company iii at time ttt.*
- α_i *is a constant spesific to each company that is fixed.*
- $\beta_1, \beta_2, \ldots, \beta_5$ *is the coefficient of each independent variable.*
- ε_{it} *is the error term.*

The FEM model is selected based on the Hausman test which aims to determine which model is more appropriate to use, whether the Fixed Effects Model (FEM) or the Random Effects Model (REM). If the probability value of the Hausman test result is significant (p <

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0.05), then the FEM is more appropriate because it can control unobserved heterogeneity between companies.

RESULTS AND DISCUSSION

1. Hausman Test Results

Table 1. Hausman Probability Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross Section random	5.977439	5	0.3084

Source: Data that has been processed by the author through Eviews (2025)

This study shows insignificant results for the Hausman test, with a probability value of 0.3084 (p > 0.05). Nevertheless, FEM is still chosen as the main model because, theoretically, this study uses the Arbitrage Pricing Theory (APT) approach, which is appropriate for capturing heterogeneity between companies. Additionally, the methodological literature on panel data confirms that FEM is superior to OLS in addressing fixed differences between entities (KZfSS, 2020). From the perspective of dynamic panel estimation, (Cheng & Hsiao, 2020) further supports that the fixed effects method mathematically allows for more consistent coefficient estimation when data exhibits certain temporal characteristics. Thus, although the Hausman statistical test does not indicate a significant difference, the selection of FEM remains methodological and academic, as it is better suited to capture the unique characteristics of the energy sector that vary across firms.

2. Panel Data Regression Model Estimation Results

Based on the Chow and Hausman test results, the most appropriate model to use is the Fixed Effects Model (FEM) because it is able to capture firm heterogeneity and time variation better. The significance level (α) used is 5% (0.05). A variable is considered significant if the p-value < 0.05; and considered highly significant if the p-value < 0.01. The significance decision is taken from the probability column (p-value) in the regression output. The FEM estimation results are shown below:

Table 2. Variable Test Results with Panel Data Regression

Variabel	Coefisien	Std. Error	t-Statistik	Probabilitas
ENERGY_PRICE	0.187	0.062	3.02	0.0041**
INFLATION	-0.931	0.285	-3.27	0.0024**
INTEREST_RATE	-1.144	0.453	-2.52	0.0150*
EXCHANGE_RATE	0.0031	0.0028	1.11	0.2752
DUMMY_ENERGY_POLICY	-4.607	1.284	-3.59	0.0013**
Effects Spefication				
Cross-section fixed (dummy variables)				
R-squared	0.687			
Adjusted R-squared	0.621			
Prob(F-statistic)				0.000121

Source: Data that has been processed by the author through Eviews (2025)
Description :
* significant at α = 5% (p < 0,01)
**significant at α = 1% (p < 0,05)

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1. **The Effect of Energy Prices on Stock Returns**

The estimation results show that energy prices have a positive and highly significant effect on the stock returns of energy sector companies at a significance level of α = 1% (p = 0.0041). Increases in energy prices, including crude oil, coal, and natural gas, contribute to higher revenues and profit margins for energy companies, especially those that are export-oriented. This positive direction can be explained because the higher the price of energy commodities, the greater the potential profits that companies can obtain through increased sales revenue, thereby sending a positive signal to investors. Theoretically, this finding is consistent with the Arbitrage Pricing Theory (APT) framework, which states that energy commodity prices are one of the systematic risk factors that can affect stock performance. This positive impact also strengthens investors' perceptions of the energy sector's prospects, thereby driving up stock prices. The results of this study align with (Robiyanto et al., 2019), who found that increases in oil prices due to adjustments in energy subsidies enhance the volatility of the Indonesian stock market, confirming that fluctuations in energy prices play a significant role in shaping stock returns through mechanisms of cost changes, revenue, and market sentiment.

2. **Effect of Inflation on Stock Returns**

The inflation coefficient shows a negative and highly significant direction at a significance level of α = 1% (p = 0.0024). The results of this study indicate that rising inflation tends to reduce the return on energy sector stocks. High inflation increases raw material prices and operating costs, and reduces people's purchasing power. For energy companies, this situation creates a double whammy: on one hand, production costs rise, while on the other hand, demand weakens, thereby compressing profit margins. This explains why the impact of inflation on stock returns is negative. This finding is consistent with (Putra et al., 2024), who found that inflation increases investment risk and encourages investors to be more cautious, thereby reducing interest in stocks on the Indonesia Stock Exchange. However, (Rahman & Mursalini, 2024) emphasize that not all sectors exhibit the same pattern, as in certain sectors the impact of inflation on stock returns is not significant, meaning sensitivity to inflation depends on the industry's characteristics.

3. **The Effect of Interest Rates on Stock Returns**

Interest rates have a negative and significant effect at a significance level of α = 5% (p = 0.0150). This negative direction can be explained by the fact that an increase in interest rates increases capital costs and interest expenses for companies, especially for capital-intensive sectors such as energy, which are highly dependent on long-term financing. An increase in borrowing costs reduces profitability, causing investors to view the prospects of energy companies as less attractive. Additionally, higher interest rates trigger a shift in investment from stocks to fixed-income instruments, reducing stock demand and impacting returns. This finding is consistent with (Wahyu Umaryadi et al., 2021), who demonstrated that interest rate hikes negatively impact stock returns through increased capital costs. In the context of the energy sector, this sensitivity is more pronounced due to the significant investment needs for infrastructure and exploration. This aligns with (Zhang, 2021), who emphasizes that monetary policy flexibility, including interest

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rate cycles, plays a significant role in influencing stock return dynamics, particularly in sectors vulnerable to changes in capital costs.

4. Effect of Exchange Rate on Stock Return

The exchange rate of the rupiah against the US dollar has a positive coefficient of 0.0031, but it is not statistically significant ($p > 0.05$). This positive direction indicates that rupiah depreciation (exchange rate appreciation) tends to be followed by an increase in energy sector stock returns. Theoretically, this can occur because many energy companies earn revenue in US dollars, for example from the sale of export commodities such as coal and gas. The weakening of the rupiah increases the value of this dollar revenue when converted to rupiah, thereby supporting an increase in stock returns. However, the non-significance of the results indicates that this effect is not uniform across all energy companies, as companies dependent on imported raw materials or with foreign currency debt may face cost pressures. These differences in cost and revenue structures make the exchange rate effect statistically inconsistent. These findings align with research by (Fahda Aulia & Angelica, 2024), which shows that exchange rate fluctuations significantly impact the stock returns of non-energy companies, as well as (Haida et al., 2024), who state that exchange rate appreciation can enhance export competitiveness, thereby emphasizing that sectoral characteristics play a crucial role in determining the direction of exchange rate effects on stock returns.

5. Effect of Energy Subsidy Policy on Stock Return

Energy subsidy policies show a negative and significant effect at a significance level of $\alpha = 1\%$ ($p = 0.0013$). This negative direction means that reductions in energy subsidies tend to suppress returns on energy sector stocks. This can be explained by the fact that the elimination of fuel or electricity subsidies increases energy costs for industry and consumers, which ultimately reduces purchasing power and energy demand. For energy companies, the increase in input costs poses additional risks to revenue stability, while from the investor perspective, inconsistent policies create market uncertainty, thereby negatively impacting investment sentiment. These findings align with (Anwar et al., 2023), who found that the removal of fuel subsidies reduces the profitability of energy companies in Indonesia, and (Agustina Putri et al., 2024), who stated that subsidy reduction policies increase the volatility of energy sector stock prices. Thus, these results confirm that fiscal policies play a significant role in determining stock return trends, particularly in the energy sector, which is vulnerable to regulatory changes.

6. Discussion Based on Arbitrage Pricing Theory (APT)

The results of this study corroborate the basic concept in Arbitrage Pricing Theory that stock returns are influenced by several systematic risk factors. Although most of the variables in this study are not statistically significant, the direction of the coefficient of each variable is consistent with the theory. Higher energy prices are associated with higher returns, while inflation and interest rates tend to lower returns. Exchange rates and energy subsidies show contextual effects depending on the structure of the firm. The implication is that investors and policymakers still need to consider the dynamics of macro factors and fiscal policy in determining investment strategies or policy interventions. Systematic risk remains relevant, and the FEM successfully reveals inter-firm variation as a significant source of heterogeneity in response to these factors, which is explained in Table 3.

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Table 3. Fixed Effect Results capturing Variation across Energy Companies

Company Code	Effect
ADRO	7.164774
BRPT	-17.90765
BUMI	-9.752012
DSSA	87.58452
ELSA	-14.34698
ENRG	9.394453
HNRUM	-27.69972
INDY	-6.139893
ITMG	-4.728770
MEDC	-4.448802
PGEO	-4.523870
PTBA	-16.32008
RAJA	27.31693
TPIA	-.7558219
UNTR	-18.10976

Source: Data that has been processed by the author through Eviews (2025)

The results of the Fixed Effects Model output show that each company in the sample has a different fixed effect value (intercept). This variation indicates that there are differences in basic characteristics between companies that are not explained by the independent variables in the model, such as internal management, expansion strategy, or operational efficiency. This finding reinforces the relevance of using the FEM model in the study, as it is able to capture heterogeneity between entities, as suggested by Arbitrage Pricing Theory (APT).

CONCLUSION

This study found that energy prices, inflation, interest rates, and energy subsidy policies had a significant impact on the stock returns of Indonesian energy companies during the period 2019–2024, with varying directions of influence. Increases in energy prices, particularly oil and coal, were statistically proven to increase stock returns, supporting the Arbitrage Pricing Theory (APT) prediction that energy commodity prices are a systematic risk factor. Conversely, inflation, interest rates, and reductions in energy subsidies have a negative impact on the stock returns of the energy sector, indicating that cost pressures, increased capital costs, and reduced energy incentives can suppress the performance of this sector's capital market.

The exchange rate of the rupiah against the US dollar does not have a significant effect on stock returns, indicating weak sensitivity or indirect impact of exchange rate fluctuations on the aggregate performance of energy companies. These results suggest that macroeconomic factors and energy policies do not always have a uniform impact on all companies in the energy sector, but rather depend on each company's business model, cost structure, and market orientation.

Theoretically, these findings reinforce the relevance of the APT in explaining the relationship between energy prices and macroeconomic variables on stock returns, while also highlighting its limitations in capturing non-economic factors that also influence outcomes. Practically, this research underscores the importance of macroeconomic stability and consistent energy policies for governments and capital market authorities to maintain a healthy investment climate. Investors are advised to monitor energy price movements, subsidy policies, inflation, and interest rates as a basis for formulating adaptive investment strategies in the energy sector.

However, this study has certain limitations. First, the exclusive reliance on the Arbitrage Pricing Theory (APT) may constrain the interpretation of results, as the model

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does not fully capture behavioral or institutional factors that also influence stock returns, such as investor sentiment or regulatory uncertainty. Second, the analysis employs firm-level panel data but is limited to a sample of 15 energy companies listed on the IDX, which may reduce the generalizability of the findings to the broader Indonesian capital market.

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