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DO CARBON EMISSIONS AND DIVIDEND POLICY AFFECT STOCK PERFORMANCE? INSIGHT FROM INDONESIA'S ENERGY FIRM

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ABSTRACT
The purpose of this study is to determine how carbon emissions measured by Carbon Emissions Intensity (CEI) and dividend policy measured by Dividend Payout Ratio (DPR) affect the stock returns of energy companies listed on the Indonesia Stock Exchange (IDX) for the period 2020-2023. This study uses a quantitative and verificative research method with a causal research design. Eight companies that met the criteria were selected after conducting sample collection techniques using purposive sampling with a total of 32 analysis units. A panel data regression model was also used to test the hypotheses in this study. Based on the results of the panel data regression analysis using the Common Effect Model as the selected model, it was found that carbon emissions (CEI) did not affect stock returns, while dividend policy (DPR) had a positive effect on stock returns. Therefore, the results of this study are expected to be taken into consideration by energy sector companies in Indonesia to make the right decisions in optimizing company performance, particularly in relation to carbon emissions, dividend policy, and stock returns.

Key words: Carbon Emissions, Dividend Policy, Carbon Emissions Intensity, Dividend Payout Ratio, Stock Return.

INTRODUCTION

In recent years, the performance of energy sector stocks has experienced sharp fluctuations globally. Starting in 2020 with the COVID-19 pandemic, and continuing in the years that followed as countries began to recover their economies after the pandemic ended. This can be seen from the data released by Morgan Stanley Capital International (MSCI) in the MSCI World Energy Index report. Based on the report, the global energy sector recorded an annual index performance of negative 30.52 percent in 2020. The sector then rebounded sharply in 2021 and 2022, posting gains of 41.77 percent and 47.60 percent, respectively. However, in 2023, annual performance declined substantially to 3.53 percent. Although the sector still generated positive growth in that year, the sharp fluctuation across the four year period reflects considerable volatility in the global energy stock market. Data drawn from the annual reports of energy companies listed on the Indonesia Stock Exchange during 2020 to 2023 reveal a contrasting pattern at the firm level. In 2023, the average stock return reached negative 8.5 percent, reversing the positive and increasing trend observed in the preceding years. This shift indicates that, despite residual global growth, energy firms listed on the IDX experienced declining shareholder returns in 2023.

It is undeniable that energy sector companies are currently undergoing a transition from the use of fossil fuels to renewable energy in order to address climate change and improve energy security. Current environmental conditions have compelled countries to formulate policies and regulatory frameworks that address global climate change. In 2015, the United Nations adopted the Sustainable Development Goals as a comprehensive framework to guide sustainable development across nations. The SDGs comprise 17 interrelated goals that seek to balance social progress, economic growth, and environmental protection. Goal 13 explicitly calls for urgent action to combat climate change and mitigate its adverse impacts. Following the signing of the Paris Agreement in 2016 by 195 countries, governments intensified efforts to design national policies aimed at reducing emissions and strengthening climate resilience. Yet responsibility for addressing climate change does not rest solely with states. Non governmental actors, particularly institutional investors, have assumed a more active role in promoting corporate accountability. Initiatives such as Climate Action 100+ monitor greenhouse gas emissions and engage with major corporations to ensure that large emitters adopt credible strategies to address climate related risks and transition challenges.

There are several ways in which these carbon emissions can affect stock returns, making investors aware of this issue. According to Bolton & Kacperczyk (2020), one reason is that companies that depend on fossil fuels are vulnerable to the technological risks of renewable energy. This is not surprising, given that fossil fuels play a major role in increasing carbon emissions. Based on the Indonesia Country Climate and Development Report (CCDR) released by the World Bank in 2023, primary energy sources contribute around 40 percent of Indonesia's GHG emissions. Around 93 percent of energy comes from fossil fuels—namely coal (43%), oil (31%), and gas (19%). As a result, investors are particularly concerned about energy sector companies due to their significant impact on tackling climate change. According to Baker et al. (2022), ESG (Environmental, Social, and Governance) factor such as carbon emission reduction, minority empowerment, or gender diversity are factors that can affect stock returns related to sustainable investment. Carbon emissions represent an important proxy for assessing corporate environmental responsibility. High emission levels generate environmental and financial risks that may influence investor perceptions and market reactions. As a result, stakeholders increasingly demand transparent carbon disclosure as an indicator of environmental performance (Shafira, 2024). From a signaling theory perspective, firms communicate environmental performance to investors through carbon related information. Mariani et al. (2024) show that firms with lower carbon intensity often receive higher market valuations, as investors interpret emission reductions as a signal of long term sustainability. Conversely, high emissions may signal greater regulatory and transition risks, which can reduce investor interest. Empirical findings remain mixed. Chen et al. (2025), Salehi et al. (2022), and Cao et al. (2023) document a significant negative relationship between carbon emissions and stock returns. In contrast, Bolton and Kacperczyk (2020) and Reshetnikova et al. (2023) find a positive association, while Aswani et al. (2024) report no significant effect. These inconsistencies highlight the need for further investigation.

Another important factor that affects stock performance is dividend policy. When investing in businesses, investors logically anticipate receiving recompense for the risks they take. Dividend yield and capital gains are the two main ways they generate returns. According to Lou (2024), dividend payments give investors comparatively steady cash flows and are a clear indication of a company's core fundamentals. As a result, a company's dividend policy serves as both a payout method and an indicator of its financial health, performance consistency, and prospects for the future. According to Mirayani et al. (2024), increasing dividend payments can boost business value and investor demand..

Empirical evidence on the relationship between dividend policy and stock returns, however, remains inconclusive. According to Veronica and Coyanda (2024), dividend policy and stock returns are positively correlated, which is in line with the conclusions of Caesaro et al. (2023) and Putri and Kufepaksi (2023). Caroline (2020) finds no statistically significant effect, however Fahira and Haryadi (2022) report a negative link. These conflicting results point to theoretical and empirical uncertainty about the consequences of dividend distributions for signaling and pricing.

This inconsistency becomes more pronounced when scholars consider sustainability related variables, particularly carbon emissions. The developed markets of China, the US, and the EU are the main focus of previous research that looks at how carbon emissions affect stock returns (Cao et al., 2023; Chen et al., 2025; Bolton and Kacperczyk, 2020; Aswani et al., 2024). Environmental factors are rarely included in studies on dividend policy and stock returns, whereas financial performance metrics are frequently included. According to Baker et al. (2022), investors are increasingly taking sustainability factors—such as ESG factors—into account when choosing their portfolios. Despite this shift in investor preferences, limited empirical work simultaneously examines environmental performance and dividend policy as joint determinants of stock returns, particularly in emerging markets.

In light of this, this study adds to the body of literature by empirically examining the impact of dividend policy, as determined by the Dividend Payout Ratio (DPR), and carbon emissions, as determined by the Carbon Emission Intensity (CEI), on stock returns. The analysis focuses on energy sector firms listed on the Indonesia Stock Exchange during the 2020 to 2023 period. The study's contribution lies in its integration of an environmental performance indicator and a corporate payout policy variable within a single empirical framework to explain variations in stock returns. By addressing inconsistencies in prior findings and incorporating sustainability considerations into dividend signaling analysis, this research aims to provide a more comprehensive understanding of how carbon emissions and dividend policy jointly influence stock return performance in the Indonesian energy sector.

METHOD

This study combined a causal research strategy with a quantitative and verifying research methodology. Secondary data gathered from documents served as the study's data sources. Purposive sampling was used to acquire a total of 32 analysis units from eight organizations that satisfied the criteria. The following are the sampling criteria used:

Table 1. Research Sample Criteria

No.	Criteria	Total
1	Energy sector companies listed on the Indonesia Stock Exchange (IDX) during the 2020-2023 period	64
2	Companies that did not disclose their carbon emissions during the 2020-2023 period	(45)
3	Companies that did not consistently distribute dividends during the 2020-2023 period	(8)
4	The company conducted stock splits or reverse stock splits during the 2020-2023 period.	(3)
Total sample studied		8
Total analysis units		32

This study uses Carbon Emission Intensity (CEI) as a proxy for carbon emissions and Dividend Payout Ratio (DPR) as a proxy for dividend policy to examine their impact on stock returns. To assist in data processing, this study will use Eviews 12 software. This study proposes two hypotheses, namely H1: carbon emissions affect stock returns and H2: dividend policy affects stock returns. A panel data regression model is also used to test the hypotheses in this study with the following model:

$$RETURN_{it} = \alpha + \beta_1 CEI_{it} + \beta_2 DPR_{it}$$

In this model, $RETURN_{it}$ represents the return on company i's shares in period t; CEI_{it} indicates the carbon emission intensity of company i in period t; DPR_{it} indicates the dividend payout ratio of company i in period t.

RESULTS AND DISCUSSION

The findings of the empirical analysis are shown in this section. The regression model meets the necessary econometric requirements, as confirmed by the traditional assumption tests. A well described linear model was indicated by the F statistic probability of 0.9824 obtained from the Ramsey RESET test. The absence of multicollinearity is confirmed by the Centered Variance Inflation Factor values of 1.000235 for the Dividend Payout Ratio and Carbon Emission Intensity. The results of the Glejser test showed no heteroscedasticity, with a Prob. Chi Square value of 0.7635 for Obs multiplied by R squared. A Prob. Chi Square value of 0.1426 from the Breusch Godfrey Serial Correlation LM Test indicates the absence of autocorrelation.

The study used the Chow, Hausman, and Lagrange multiplier tests to identify the proper panel data specification. According to the findings, the Common Effect Model is the best estimating strategy for this investigation. As a result, the following regression equation uses the Common Effect Model in the study.

Table 2. Results of Panel Data Regression Analysis Using the Common Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.042290	0.107193	-0.394522	0.6961
CEI	-190.5759	208.6696	-0.913290	0.3686
DPR	0.293537	0.063080	4.653421	0.0001

R-squared	0.435394	Mean dependent var	0.136250
Adjusted R-squared	0.396456	S.D. dependent var	0.454503
S.E. of regression	0.353094	Akaike info criterion	0.844898
Sum squared resid	3.615595	Schwarz criterion	0.982310
Log likelihood	-10.51836	Hannan-Quinn criter.	0.890446
F-statistic	11.18163	Durbin-Watson stat	2.944317
Prob(F-statistic)	0.000251		

Based on the table presented above, the regression model is as follows:

$$RETURN_{it} = -\ 0.042290\ -\ 190.5759\, CEI_{it} +\ 0.293537\, DPR_{it}$$

From the regression model, it can be explained that:

1. If a = constant of – 0.042290, it can be interpreted that the independent variables, namely carbon emissions (CEI) and dividend policy (DPR), are considered constant or have a value of 0, so that the stock return has a value of – 0.042290%.
2. The regression coefficient value of the carbon emissions (CEI) variable is –190.5759, which indicates that for every 1% increase in CEI, stock returns will decrease by 190.5759%.
3. The regression coefficient value of the dividend policy (DPR) variable is 0.293537, indicating that for every 1% increase in DPR, stock returns will increase by 0.293537%.

Based on the table above, testing conducted with an error rate of 0.05 shows a probability value of 0.3686 for the carbon emissions variable (CEI), which means that carbon emissions do not affect stock returns. Furthermore, the dividend policy variable (DPR) shows a probability value of 0.0001, which means that dividend policy affects stock returns.

Table 2 indicates that there is no correlation between carbon emissions and stock returns using the Carbon Emissions Intensity (CEI) proxy in this analysis, hence rejecting H1. An essential finding for comprehending how Indonesian investors view corporate environmental performance when making investment decisions is the lack of a correlation between carbon emissions and stock returns of energy sector companies listed on the Indonesia Stock Exchange (IDX) between 2020 and 2023. According to earlier research, investor preferences for environmentally responsible companies and the idea of a carbon premium can both have an impact on returns. For example, Bolton & Kacperczyk (2020) found a positive effect of carbon emissions on stock returns, explaining that this result could occur due to the concept of carbon premium. This concept refers to the increase in returns demanded by investors from companies that are considered to have a higher carbon footprint or are exposed to climate change risks. They explain that companies that are highly dependent on fossil fuels are more exposed to the risk of cheaper renewable energy technologies, so investors demand compensation for continuing to hold these shares, which ultimately increases stock returns. They further contend that firms with high carbon emissions may generate higher returns because greater emissions often correlate with higher revenues and production scale. Reshetnikova et al. (2023) report similar findings in the Russian market, where carbon emissions positively affect stock returns due to the presence of a carbon premium. Investor preferences for environmentally responsible firms also shape this relationship. Lontzek et al. (2022) explain that although high emitting firms may benefit from a carbon premium, unexpected global climate damage can shift investor sentiment. In such situations, environmentally friendly firms may attract green investors who anticipate stronger economic consequences from climate change and therefore favor low emission companies.

Bauer et al. (2022) argue that when investors exhibit strong preferences for green assets, rising demand for environmentally responsible firms can drive superior stock performance relative to less environmentally friendly companies. In this view, investor taste for sustainability can shape asset pricing outcomes and generate excess returns for low emission firms. However, several studies question whether carbon emissions systematically influence stock returns. Dai (2020) finds no robust empirical evidence that carbon emission intensity conveys reliable information about future stock performance. He suggests that limited shifts in investor demand toward sustainability may weaken the pricing effect of carbon related information. Aswani et al. (2024) offer an additional explanation, noting that inconsistent data sources and differences between scaled and unscaled emission measures may obscure the true relationship between carbon emissions and stock returns.

The finding that carbon emissions do not significantly affect stock returns can be interpreted in light of prior studies that report mixed evidence regarding the valuation relevance of environmental performance. One plausible explanation is that carbon emission disclosure among Indonesian firms remains relatively recent, which limits its immediate influence on investor behavior. Although the Financial Services Authority introduced POJK No. 51/POJK.03/2017 concerning the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies in 2017, the regulation became effective for issuers and public companies only on January 1, 2020, pursuant to Article 3 Paragraph (1b). As a result, the integration of sustainability information into capital market assessments may still be at an early stage.

Disclosure practices also limit the potential market impact of carbon performance. Sustainability reports published between 2020 and 2023 show that only 22 of 64 energy companies listed on the Indonesia Stock Exchange disclosed their carbon emissions. This limited transparency indicates that many firms have not institutionalized comprehensive environmental reporting. When disclosure remains partial and inconsistent, investors struggle to incorporate carbon metrics into valuation models with confidence.

The absence of a statistically significant relationship between carbon emissions and stock returns therefore suggests that investors in the Indonesian energy sector have not systematically priced carbon performance into their investment decisions during the observed period. This finding does not imply that environmental risk lacks relevance. Instead, it may indicate that sustainability considerations have not yet developed into a dominant factor in asset pricing within this market context.

Table 2 shows that dividend policy, proxied by the Dividend Payout Ratio, has a positive and significant effect on stock returns, which supports H2. This finding indicates that investors consider dividend policy when investing in energy sector companies listed on the Indonesia Stock Exchange during the 2020 to 2023 period. Firms with higher Dividend Payout Ratios attract investors because they provide greater income certainty.

This finding is consistent with the Bird in the Hand Theory advanced by Myron Gordon and John Lintner, which argues that investors prefer dividends over uncertain future capital gains. Investors perceive dividends as more certain and therefore less risky, particularly in industries characterized by high volatility such as the energy sector. High dividend payouts signal financial strength and operational stability, whereas low or absent dividends may indicate weaker future prospects.

Empirical evidence supports this perspective. Putri and Kufepaksi (2023), Caesaro et al. (2023), and Veronica and Coyanda (2024) each document a positive relationship between dividend policy and stock returns. These results suggest that dividend distributions remain a critical signal in shaping investor expectations and market valuation.

CONCLUSION

Based on the results and discussion, this study concludes that carbon emissions do not exert a significant effect on stock returns. In contrast, dividend policy demonstrates a positive and significant influence on stock returns. These findings suggest that, within the observed context, investors place greater weight on dividend distributions than on carbon performance when forming investment decisions.

These results offer several practical implications for energy sector companies in Indonesia. First, firms should disclose carbon emissions in their sustainability reports to strengthen transparency regarding environmental impact. Second, companies should continue efforts to reduce carbon emissions and support the transition toward cleaner energy in line with sustainable business principles, even if such actions do not immediately influence stock returns.

Third, both companies and investors should pay close attention to the dividend payout ratio, as the findings indicate that dividends play an important role in increasing share demand and enhancing investor income. Finally, future research should extend the analysis to other sectors or broader samples to improve the generalizability of the findings.

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