

Environmental, Social, and Governance Performance and Investment Efficiency: The Energy Sector Indonesia

Afnei Ngan Billy Tumba¹⁾

¹⁾Department of Management, Universitas Gadjah Mada, Yogyakarta
Email: afneinganbillytumba@mail.ugm.ac.id¹⁾

ABSTRACT

Environmental, Social, and Governance (ESG) has become an interesting issue in corporate sustainability reports in Indonesia, awareness of the importance of the environment in the business chain encourages companies in the energy sector in Indonesia to start implementing it, the impact of ESG strategies and operations on company performance is a topic of discussion in modern academic and business research today. Researchers also look at the efficiency of corporate investment. Companies in the energy sector are required to implement ESG in their business chain, what about the investment efficiency that occurs in energy sector companies that are directly involved in the issue of environmental problems caused in the company's operational activities. The purpose of this study is to analyze the effect of investment efficiency and ESG performance on company performance in the energy sector listed on the Indonesia Stock Exchange (IDX). The method is used the Hodrick-Prescott Filter to determine investment efficiency and ESG Score as data to see ESG performance. The samples used in this study are energy sector companies listed on the Indonesia Stock Exchange (IDX) from 2019-2023 that have ESG Score. The main result is the effect of ESG performance and corporate investment efficiency affect the performance of energy sector companies in Indonesia. The conclusion of this study will contribute to energy sector companies in Indonesia in the practice of implementing ESG and forming investment efficiency strategies in the business chain for company performance in Indonesia.

Keywords: ESG, investment efficiency, firm performance, hodrick-prescott filter.

ABSTRAK

Environmental, Social, and Governance (ESG) menjadi isu menarik dalam laporan keberlanjutan perusahaan di Indonesia, kesadaran akan pentingnya lingkungan hidup dalam rantai bisnis mendorong perusahaan-perusahaan di sektor energi di Indonesia untuk mulai menerapkannya, dampak dari strategi ESG dan operasi terhadap kinerja perusahaan adalah topik diskusi dalam penelitian akademis dan bisnis modern saat ini. Peneliti juga melihat efisiensi investasi perusahaan. Perusahaan sektor energi wajib menerapkan ESG dalam rantai bisnisnya, bagaimana dengan efisiensi investasi yang terjadi pada perusahaan sektor energi yang terlibat langsung dalam isu permasalahan lingkungan hidup yang ditimbulkan dalam kegiatan operasional perusahaan. Tujuan dari penelitian ini adalah untuk menganalisis pengaruh efisiensi investasi dan kinerja ESG terhadap kinerja perusahaan sektor energi yang terdaftar di Bursa Efek Indonesia (BEI). Metode yang digunakan adalah Hodrick-Prescott Filter untuk mengetahui efisiensi investasi dan skor ESG sebagai data untuk melihat kinerja ESG. Sampel yang digunakan dalam penelitian ini adalah perusahaan sektor energi yang terdaftar di Bursa Efek Indonesia (BEI) tahun 2019-2023 yang memiliki skor ESG. Hasil utamanya adalah pengaruh kinerja ESG dan efisiensi investasi perusahaan berpengaruh terhadap kinerja perusahaan sektor energi di Indonesia. Kesimpulan penelitian ini akan memberikan kontribusi bagi perusahaan sektor energi di Indonesia dalam praktik penerapan ESG dan pembentukan strategi efisiensi investasi dalam rantai bisnis terhadap kinerja perusahaan di Indonesia.

Kata Kunci: ESG, efisiensi investasi, kinerja perusahaan, hodrick-prescott filter.

1. Introduction

Public awareness of the importance of environmental issues has a wide impact on daily life, including in finance and accounting. Companies today are required to be able to implement ESG (Environmental, Social, and Governance) practices in their business processes for the benefit of investors and the disclosure of ESG scores needs to be emphasized (Buallay, 2019). Especially for companies that are closely related to creating environmental pollution, this

happens because it is related to the company's operational activities that use non-renewable natural resources. Good ESG implementation in the company illustrates that the company has a sharp knowledge in long-term strategies so that the company can manage its long-term goals. So far, companies in Indonesia have experienced an increase in the exploitation of massive resources only for the financial interests of the company which can ultimately cause enormous environmental damage in Indonesia (Jeanice & Kim, 2023).

Today's academic and business research is debating the effect of ESG operations and strategies on firm performance. Nevertheless, given that businesses engaged in ecologically sensitive industries are crucial to maintaining ecological sustainability, research on the relationship between ESG literacy and the performance of environmentally conscious businesses and ESG activities on firm performance is still lacking. Due to the direct environmental impact of their operations and output, businesses in the energy, mining, metals, construction, chemical, and paper sectors might be categorized as environmentally sensitive businesses. (Garcia, et al., 2017; Naeem et al., 2022). According to research by Garcia et al. (2017), the findings of their study have a greater bearing on how ESG performance affects business success, particularly for environmentally conscious businesses operating in developed and developing nations' legal and economic contexts. Their results support those of academic scholars who have generally discovered a positive correlation between ESG and corporate performance. (Alshehhi, Nobanee, & Khare, 2018; Friede, Busch, & Bassen, 2015).

In addition to ESG performance in this study to see its influence on company performance, researchers also look at the company's investment efficiency. Companies in the energy sector are required to implement ESG in their business chain, what about the investment efficiency that occurs in energy sector companies that are directly involved in the issue of environmental problems caused in the company's operational activities. In the literature, there are many studies on analyzing barriers to resource investment efficiency, but academic studies that measure the contribution of investment efficiency to company performance are still relatively step (Jové-Llopis & Segarra-Blasco, 2018; Özbuğday et al., 2020). Previous research found on an international scale shows a positive impact of investment efficiency on performance in the energy sector (Özbuğday et al., 2020).

The purpose of this study is to analyze the effect of investment efficiency and ESG performance on company performance in the energy sector listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. This research is useful for companies engaged in the energy sector to see whether implementing ESG practices in their business series and investment efficiency practices in corporate investment decisions can improve company performance or vice versa. This research can also answer the challenges of other energy sector companies to implement ESG practices in their operations, especially for companies that are directly involved with environmental pollution problems in Indonesia.

2. Literature Review and Hypothesis Development

2.1 Environmental, Social, and Governance

ESG performance disclosure is expected to be a social investment that fulfills the interests of stakeholders and helps improve company performance. The company gains strong legitimacy in the eyes of society and stakeholders using ESG disclosures. As a result, it is expected to provide a positive picture of the company due to the disclosures made. Disclosure of ESG performance

will bring greater asset returns (Buallay, 2019). According to Velte (2019) revealed that ESG performance has a positive linear effect on company performance. ESG investment reduces corporate prevents management shortsightedness and free cash flow, improving investment efficiency and thereby reducing agency costs; useful reduces ESG information the negative effects of media coverage, external pressure, and operating costs. (Naeem et al., 2023). ESG performance can also improve investment efficiency and can reduce constraints from corporate funding based on the explanation above, the following hypothesis can be drawn:

H1a= ESG performance can have a positive effect on company performance

H1b= ESG performance can positively affect the efficiency of corporate investment

2.2 Investment Efficiency

To achieve investment efficiency, it is necessary to consider investment opportunities that can benefit the company by making the right manager decisions, in investment decisions, managers have the right to determine the principles that apply in their decisions. One of them is accounting conservatism, conservatism is a principle that recognizes costs, debts, profits, and assets immediately. However, it needs to be done with care in reporting the company's financial statements to avoid risk (Rizki Saputra & Wicaksono, 2022). Company performance affects investment efficiency. Uncertainty from parties such as suppliers, customers, regulators, and competitors, among others can change the company's main operations beyond the company's ability to control. This can lead to substantial changes in firm performance (Bilyay-Erdogan et al., 2023; Lian & Weng, 2024). When performance volatility increases, it indicates that there is a high degree of information asymmetry between the business and the outside market. This makes it difficult for businesses to predict changes in consumers, industry technology, and other factors. In such a situation, managers do not have relevant and sufficient information to make investment decisions, so they cannot accurately estimate market risks, which increases the probability of their decisions failing. In addition, high performance volatility can quickly mask managers' self-serving investment behavior, allowing them to make inefficient and self-serving investments. (Smale, 2021; Zhang, 2023). Based on the explanation above, the following hypothesis can be drawn:

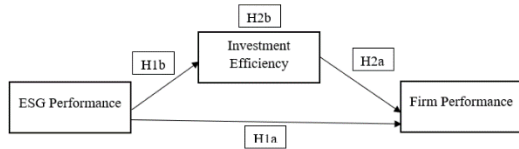
H2a= Directly investment efficiency has a negative effect on company performance.

H2b= Investment efficiency positively mediates the relationship between ESG performance and firm performance.

2.3 Research Framework

Based on the development of the hypothesis that has been prepared, the following research framework can be made:

Figure 1. Research Framework



3. Metode

3.1 Population and Sampling Method

In the study, the population taken was energy sector companies listed on the Indonesia Stock Exchange (IDX) from 2019-2023. The sampling method used is purposive sampling with criteria. Energy sector companies in Indonesia and energy sector companies that have ESG scores.

Table 1. Sample Selection

Description	Total
Companies listed on the IDX in 2023	833
Energy sector companies in Indonesia	82
Energy sector companies reporting 2023	
ESG performance	8

Source: Data processed

3.2 Variable

3.2.1 Firm Performance

The BEP ratio can provide a better measure of a company's performance or profitability because it helps management use assets more efficiently to generate revenue:

$$\text{Basic Earning Power (BEP)} = \frac{\text{Earning Before Interest and Tax (EBIT)}}{\text{Total Asset}}$$

3.2.2 Environmental, Social, and Governance (ESG)

According to (Refinitiv, 2022) ESG Score will provide a comprehensive and holistic assessment of a company's ESG performance based on reported information relating to the ESG pillars, with a layer of ESG controversies drawn from media sources around the world. When companies are not involved in ESG controversies, the ESG score is calculated as a weighted average of the ESG score and ESG controversy score per fiscal period, with the most recent controversy reflected in the previous fiscal period having been resolved.

$$\text{Score} = \frac{\text{no.of companies with a worse value} + \frac{\text{no.of companies with the same value included in the current one}}{2}}{\text{no.of companies with a value}}$$

3.2.3 Investment Efficiency

Investment efficiency is measured by taking the absolute value of residuals using the Hodrick-Prescott Filter (HP Filter) method:

$$\text{Investment}_{i,t}^{\text{New}} = \text{DebtRatio} + \text{Risk} + \text{Size} + \text{SalesGrowth} + \text{AssetTurnover} + \text{GrowthOption} + \text{CashFlow} + V_{i,t}$$

3.3 Hodrick Prescott Filter (HP Filter)

HP Filter is a technique used to remove the cyclical components of a time series from the raw data. Filters are especially useful in economic time series analysis, on the basis that they decompose the time series into high and low frequency components, and the smoothness of the trend line depends on the multiplier. The most popular filter for extracting cyclical and trend components from observed time series is the HP Filter. In research, where λ is the smoothing parameter. Typically, researchers use $\lambda = 100, 1600,$ and 14400 for annual, quarterly, and monthly data, many researchers consider the multiplication parameter $\lambda = 1600$ as a universal constant. It has long been known that the HP Filter is the best filter under some specific conditions. With a higher doubling, the time series is more susceptible to short-term changes.

4. Results and Discussion

Table 2. Descriptive Statistics

Variable	N	Min	Max	Mean	Std.Dev
BEP	40	0.01	0.75	0.20	0.18
ESG	40	0.00	85.82	56.35	26.77
INV	40	1.20	2.08	1.64	0.23
ESG INV	40	0.00	121.34	87.50	38.69
Valid N	40				

Source: Data processed

From Table 2, In analyzing the ESG performance of energy sector companies in Indonesia, it was found that ESG performance scores varied from a minimum of 0% to a maximum of 85%. This range reflects the level of diversity in the implementation of sustainable practices among companies in the energy sector in Indonesia. At the minimum ESG performance score of 0%, there are companies that have not adopted or have significantly measurable sustainable practices in place before 2023. This may indicate that there is room for improvement in terms of integrating environmental, social and governance aspects in the company's operations and policies. On the other hand, at the maximum ESG performance score of 85%, there are companies that have adopted and implemented sustainable practices thoroughly in their operations. This reflects a strong commitment to environmental sustainability, social responsibility, and good corporate governance. Given this variation, it can be inferred that some companies in Indonesia's energy sector have shown leadership in implementing sustainable practices, while others may still be in the early stages or need to step up their efforts. This highlights the importance of concerted efforts in encouraging companies to improve their ESG performance to achieve greater sustainability in the energy industry in Indonesia.

From the descriptive statistics, the value of investment efficiency ranges from 1% to 2%. This means that companies in the energy sector in Indonesia have a manageable and stable level of investment efficiency within this range. From the available data, the minimum value of investment efficiency is 1%, indicating that there

are companies that have lower levels of investment efficiency. Nonetheless, this still indicates that even the companies with the lowest investment efficiency are still able to allocate a portion of their investment in an efficient manner. On the other hand, the maximum value of investment efficiency is 2%, indicating that there are companies that manage to allocate their investments very efficiently, close to the upper limit of the investment efficiency range. This illustrates that there are companies in the energy sector in Indonesia that can optimize the use of their investment resources to achieve maximum returns.

Table 3. Heteroscedasticity Test

Variable	Beta	t	Sig.
ESG	0.321	1.251	0.219
INV	0.000	0.001	1.000

Source: Data processed

The results of the Glejser heteroscedasticity test show that the significance value (Sig.) for ESG Performance (ESG) is 0.219, while for Investment Efficiency (INV) is 1.000. The significance value (Sig.) being higher than the alpha value of 0.05 indicates that there is insufficient evidence to reject the null hypothesis, which means there is insufficient evidence to conclude the presence of heteroscedasticity in the regression model. Therefore, from the analysis of the Glejser heteroscedasticity test, we can conclude that the assumption of homoscedasticity is met, which indicates that the variability of the residuals in the regression model is relatively constant across the range of values of the ESG performance and Investment Efficiency predictors.

Table 4. Multicollinearity Test

Variable	Collinearity Statistics		
	Beta	Tolerance	VIF
ESG	0.003	0.367	2.724
INV	0.137	0.367	2.724

Source: Data processed

The multicollinearity test results show that the VIF value for the ESG (Environmental, Social, Governance) performance variable is 2,724, while for the Investment Efficiency (INV) variable it is also 2,724. A VIF value of less than 10 indicates that there is no significant multicollinearity problem in the regression model. Thus, from the results of this multicollinearity test analysis, it can be concluded that the two independent variables, namely ESG performance and Investment Efficiency, do not show any significant multicollinearity problems. This means that these two variables can be considered together in the regression model without worrying about producing inconsistent or unreliable estimates.

Table 5. Regression Test

	BEP	INV
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Variable	Coefficients	t	Coefficients	t
ESG	0.266	1.699***	-0.796	-8.095*
INV	-0.482	-3.389**		
ESG INV	0.288	1.855***		

Source: Data processed

Description: *** Significant at alpha 10%
** Significant at alpha 5%
* Significant at alpha 1%

The regression results show that there is a positive and significant relationship between ESG performance and company performance in the energy sector in Indonesia. The regression coefficient between the ESG performance variable and firm performance has a statistically significant value. The interpretation of the regression results is that energy companies that have better ESG performance tend to have better financial performance as well. In other words, companies that pay attention to environmental, social, and governance aspects in their operations tend to generate higher profits, more stable growth, and better value for their shareholders. Factors that may account for this positive relationship between ESG performance and firm performance include improved operational efficiency, a better reputation in the eyes of investors and consumers, and the ability to cope with changing regulations and increasingly stringent market demands related to environmental and social issues. Thus, the findings from this regression analysis confirm the importance of paying attention to ESG aspects in the business strategies of energy companies in Indonesia. Companies that invest in sustainable and socially responsible business practices have the potential to achieve better financial performance in the long run, while also providing wider benefits to society and the environment.

The analysis shows that there is a significant positive relationship between ESG performance and investment efficiency of energy sector companies in Indonesia. This means that companies with better ESG performance tend to have a higher level of investment efficiency. This indicates that environmental, social and corporate governance factors play an important role in determining the level of investment efficiency of companies in the energy sector. Furthermore, the regression results also show that the ESG performance variable significantly explains the variation in the level of investment efficiency of companies in the energy sector. Thus, this study provides empirical support for the concept that companies that perform highly in terms of ESG factors tend to have better investment efficiency. The findings have important implications for business practitioners, regulators and other stakeholders in the energy sector in Indonesia. They can use this information to develop strategies and policies that encourage firms to improve their ESG performance, in the hope of improving investment efficiency and the overall performance of the energy industry in Indonesia.

The regression results of investment efficiency on firm performance show that the higher the level of investment efficiency of a firm, the lower the performance of firms in the energy sector in Indonesia.

The interpretation of the results is that companies that allocate their investments efficiently tend to face challenges in achieving better performance. This may be due to several factors, such as underinvestment in infrastructure needed to increase production or operational efficiency. It may also reflect difficult market conditions or external pressures, such as fluctuating energy prices or changes in government policies that affect companies' investments and operations in the energy sector. In this context, company management may need to re-evaluate their investment strategy to ensure that efficient capital allocation also has a positive impact on the company's long-term performance. This could involve adjustments to investment strategies, closer market monitoring, and better risk management plans to address the challenges faced by companies in the energy sector in Indonesia.

The regression analysis results show a significant positive relationship between ESG performance and the performance of energy sector companies in Indonesia. This suggests that companies with better environmental, social and governance practices tend to achieve better performance in the context of the energy industry. Furthermore, investment efficiency has been found to be a significant mediator in the relationship between ESG performance and firm performance. This indicates that investment efficiency plays a role in linking sustainable practices with firms' financial outcomes in the energy sector. In other words, firms that implement better ESG practices tend to allocate their investments more efficiently, which in turn improves their financial performance. These findings provide strong evidence that the adoption of sustainable practices not only supports the long-term business growth of energy sector companies but can also improve the efficient use of investment resources. This provides a strong basis for energy sector companies in Indonesia to consider the integration of ESG performance in their business strategy to improve their financial performance while being mindful of environmental and social impacts.

5. Conclusion

This study investigates the impact of ESG performance and investment efficiency on firm performance in the energy sector in Indonesia. Through rigorous analysis, it has been identified that these two factors play a significant role in determining the performance of companies in the energy sector, with important implications for their sustainability and business success. In the context of ESG performance, the findings show that companies in Indonesia's energy sector experience significant variation in the adoption of sustainable practices. While there are companies that have demonstrated a strong commitment to environmental, social, and corporate governance aspects, there is still room for improvement for others. Therefore, companies need to strengthen their commitment to ESG performance to achieve greater sustainability. Investment efficiency also plays a crucial role in determining the performance of energy sector companies in Indonesia.

The study found that companies that can allocate their investments efficiently have better financial performance. This highlights the importance of good management of financial resources, focusing on projects that deliver optimal returns. However, more interesting is the finding that investment efficiency may act as a mediator in the relationship between ESG performance and firm performance. This suggests that sustainable practices not only have a direct impact on firm performance but may also influence the way firms allocate their investments, which in turn affects their financial outcomes. The limitation of this study is that this research only focuses on the energy sector which is considered to have a direct impact on the environment and does not look at other sectors in Indonesia how ESG performance affects company performance.

Thus, in conclusion, there is a complex relationship between ESG performance, investment efficiency, and firm performance in the energy sector in Indonesia. Companies in this sector can gain a significant competitive advantage by improving their ESG performance and paying attention to efficient investment management. This is not just about improving the company's image or meeting regulatory requirements, but also about creating sustainable long-term value for the company, stakeholders, and society.

Bibliography

- Alshehhi, A., Nobanee, H., & Khare, N. (2018). The Impact of Sustainability Practices on Corporate Financial Performance: Literature Trends and Future Research Potential. *Sustainability*, 10(2), 494. <https://doi.org/10.3390/su10020494>
- Anaima, N., & Trisnainingsih, S. (2021). Pengaruh Mekanisme Corporate Governance terhadap Kinerja Keuangan dengan Ukuran Perusahaan Sebagai Variabel Kontrol. *Jurnal Ilmiah Ekonomi Global Masa Kini*, 12(2), 83–90. <https://doi.org/10.36982/jiegmk.v12i2.1348>
- Bilyay-Erdogan, S., Danisman, G. O., & Demir, E. (2023). ESG performance and dividend payout: A channel analysis. *Finance Research Letters*, 55, 103827. <https://doi.org/10.1016/j.frl.2023.103827>
- Buallay, A. (2019). Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector. *Management of Environmental Quality: An International Journal*, 30(1), 98–115. <https://doi.org/10.1108/MEQ-12-2017-0149>
- Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210–233. <https://doi.org/10.1080/20430795.2015.1118917>
- Garcia, A. S., Mendes-Da-Silva, W., & Orsato, R. J. (2017). Sensitive industries produce better ESG

- performance: Evidence from emerging markets. *Journal of Cleaner Production*, 150, 135–147. <https://doi.org/10.1016/j.jclepro.2017.02.180>
- Jeanice, J., & Kim, S. S. (2023). Pengaruh Penerapan ESG Terhadap Nilai Perusahaan di Indonesia. *Owner*, 7(2), 1646–1653. <https://doi.org/10.33395/owner.v7i2.1338>
- Jové-Llopis, E., & Segarra-Blasco, A. (2018). Eco-Efficiency Actions and Firm Growth in European SMEs. *Sustainability*, 10(1), 281. <https://doi.org/10.3390/su10010281>
- Lian, Y., & Weng, X. (2024). ESG performance and investment efficiency. *Finance Research Letters*, 62, 105084. <https://doi.org/10.1016/j.frl.2024.105084>
- Naeem, M. A., Yousaf, I., Karim, S., Tiwari, A. K., & Farid, S. (2023). Comparing asymmetric price efficiency in regional ESG markets before and during COVID-19. *Economic Modelling*, 118, 106095. <https://doi.org/10.1016/j.econmod.2022.106095>
- Naeem, N., Cankaya, S., & Bildik, R. (2022). Does ESG performance affect the financial performance of environmentally sensitive industries? A comparison between emerging and developed markets. *Borsa Istanbul Review*, 22, S128–S140. <https://doi.org/10.1016/j.bir.2022.11.014>
- Özbuğday, F. C., Findik, D., Metin Özcan, K., & Başçı, S. (2020). Resource efficiency investments and firm performance: Evidence from European SMEs. *Journal of Cleaner Production*, 252, 119824. <https://doi.org/10.1016/j.jclepro.2019.119824>
- Pebrianti, S., & Sudrajat, A. M. (2023). Pengaruh Profitabilitas, Likuiditas, dan Ukuran Perusahaan Terhadap Manajemen Laba Pada Perusahaan Multifinance Non Perbankan Yang Terdaftar Di Bursa Efek Indonesia Tahun 2020 - 2022. *Jurnal Ilmiah Ekonomi Global Masa Kini*, 14(2), 148–157. <https://doi.org/10.36982/jiegmk.v14i2.3381>
- Refinitiv. (2022). *Environmental, Social and Governance (ESG) Scores from Refinitiv - May 2022*.
- Rizki Saputra, M., & Wicaksono, R. (2022). Faktor-faktor yang mempengaruhi efisiensi investasi pada perusahaan sektor pertambangan yang terdaftar di Bursa Efek Indonesia. *Fair Value: Jurnal Ilmiah Akuntansi Dan Keuangan*, 5(2), 708–722. <https://doi.org/10.32670/fairvalue.v5i2.2102>
- Smales, L. A. (2021). Investor attention and global market returns during the COVID-19 crisis. *International Review of Financial Analysis*, 73, 101616. <https://doi.org/10.1016/j.irfa.2020.101616>
- Velte, P. (2019). Does CEO power moderate the link between ESG performance and financial performance? *Management Research Review*, 43(5), 497–520. <https://doi.org/10.1108/MRR-04-2019-0182>
- Zhang, D. (2023). Does green finance really inhibit extreme hypocritical ESG risk? A greenwashing perspective exploration. *Energy Economics*, 121, 106688. <https://doi.org/10.1016/j.eneco.2023.106688>