



Impact of Agency Costs, Board Environmental Committee, Board Gender Diversity, Environmental Performance and Institutional Ownership on Firm Performance

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Abstract

The research objective is to evaluate the effect of environmental corporate governance on firm performance measured by return on assets. The independent variables consist of environmental performance, board gender diversity, institutional ownership, agency costs, and board environmental committee. This study involved 260 observations of 52 Indonesian companies from the energy sector in the 2018-2022 period. The results of this study indicate that there is a significant relationship between environmental performance and board environmental committee on firm performance of Indonesian companies in the energy sector. Meanwhile, board gender diversity and institutional ownership show no significant relationship to firm performance of Indonesian companies in the energy sector. Lastly, low agency costs are proven to show a significant relationship towards firm performance. In this research, agency cost measured by total asset turnover significantly improves the firm's return on assets. The results of this study provide additional knowledge about the relationship between environmental corporate governance towards firm performance.

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1. INTRODUCTION

According to Akhanolu et al. (2023) when the environmental performance of a company develops, it will also lead to an increase in the company's performance. This study aims to see how the performance conditions of energy sector companies whose emissions income are relatively high and must maintain the company's environmental performance as well. In order to increase profits for shareholders and stakeholders, company performance is very important. Therefore, company management needs to know the factors that affect company value (Aini & Faisal, 2021). Environmental performance affects the performance of a company because maintaining the sustainability of the company's environment requires control by environmental governance. The existence of a Board Environmental Committee can also improve the performance of a company (Shah et al., 2021).

In the past few years, communities, company shareholders, and even the government has realized the importance of preserving the environment. Companies face increasing societal pressure to be involved in preserving the environment and integrate environmental concerns in making business decisions in order to be achieve optimal profitability



(Indriastuti et al., 2021), since they rely on foreign economic networks in order to gain access to more competitive advantages and resource of each company (Darus, Zuki, & Yusoff, 2020). Besides relying on foreign economic networks, companies also rely on their stakeholders. Nowadays stakeholders keep increasing their demand for increased green company activities, this means that for most companies, maintaining their environmental performance means surviving (Ganda, 2018). Aini and Faisal (2021) stated that good environmental performance will improve the overall company's financial performance. Globally, the highest carbon emitting sector is the energy sector. The energy sector alone emitted 36% of the world's greenhouse gases from 1999 to 2019 (20-year period). The highest carbon emitting sector in Indonesia is also the energy sector based on the greenhouse gas emissions data from 2000 to 2019. While Indriastuti et al. (2021) stated that by 2020, firms in Indonesia have already committed to reducing 0.67 gigatons of carbon emissions. Still, we want to know how the worst environmental friendly sector performs financially.

A gender-diverse board of directors is intrinsic to agency theory in justifying board positions in matters of monitoring and control. Therefore, diversity of genders on the board reduces agency problems due to certain cultural aspects (Kabir et al., 2022). Taking these assumptions into account, the presence of women on the board of directors will increase company profits and also reduce agency problems thus improving the firm's performance (Rubino et al., 2021). In order to handle agency-related concerns, institutional ownership has the time and capacity to oversee firm management. However, studies continue to disagree on how they affect the company (Satt et al., 2021). Agency cost issues have also been getting much attention from businesses across the world (Thi & Khuyen, 2021). Agency problems can cause an increase of agency costs including welfare losses, bonding and also monitoring fees, which all reduce the value of a firm (Baykara, 2021). Agency costs appear in various forms such as self-serving management behavior, indirect consumption, work shirking, poor investment choices and also corporate fraud. The adverse impact of this type of cost can harm a firm's financial performance and stakeholder's wealth (Baykara, 2021).

The ever-changing regulatory landscape that governs environmental activities poses a challenge for boards to stay abreast of developments. Moreover, boards find it difficult to manage and satisfy a range of expectations while striking a balance with financial goals since stakeholders expect responsibility and transparency from corporate sustainability initiatives. Environmental teams, which include technical competence, strategic guidance, compliance assurance, innovation and research, and stakeholder engagement, are therefore essential in navigating these intricate concerns. Boards are assisted by sustainability teams in navigating the legal environment, keeping up with technical developments, evaluating the viability of green technology, and suggesting sustainable practices that are in line with the objectives of the organization. Their knowledge also aids in determining ecologically friendly and economically viable solutions for sustainability issues (Almaqtari et al., 2023).

Our study contributes to extant literature in different ways, providing a multifaceted examination of the intricate relationship between a firm's environmental performance and its overall performance. Firstly, by looking at how a firm's environmental performance may affect a firm's performance, we delve deeper into a topic that has garnered increasing attention in recent years. While there is a growing amount of research that explores the relationship between environmental performance and firm performance (Ganda, 2018; Akhanolu et al., 2023), our research distinguishes itself by integrating and synthesizing various theoretical frameworks and empirical models to offer a more comprehensive understanding. Specifically, we not only investigate the direct impacts of environmental performance on financial metrics such as profitability and market valuation but also examine the effects of several critical factors, including agency costs, the presence of a dedicated board environmental committee, board gender diversity, and institutional ownership.

By incorporating agency costs into our analysis, we aim to shed light on how conflicts of interest and managerial discretion influence the relationship between environmental practices and financial outcomes. Additionally, our exploration of board environmental committees provides insights into how specialized governance structures can enhance a firm's commitment to sustainability and operational efficiency. Moreover, we consider the role of board gender diversity, positing that a more diverse board may bring varied perspectives that foster innovative approaches to environmental management, ultimately leading to improved firm performance. Lastly, we assess how institutional ownership might act as a catalyst for greater accountability and transparency in environmental practices, thus encouraging firms to adopt more robust sustainability strategies that resonate well with stakeholders. The rest of this research is divided into five sections. We review the relevant literature and develop our hypotheses in the next section. In the third section, we provide information on the sample, variables, and methodology. The discussion on findings and empirical analysis in the next section and the paper ends with conclusion.

Literature Review

a. Environmental Performance and Firm Performance

Reducing adverse effects on the environment through environmental performance is the company's goal to add value for investors. (Aini and Faisal, 2021). The measurement of sustainability is based on its ESG score, also with other measurements such as CO₂, emission score and environmental score pillar are positively significant in relation to market-based and accounting-based measures (Basuony et al., 2023). Ghardallou, (2022) Found that the firm's environmental performance has a positively significant effect towards a firm's financial performance. Similarly, research by Ismail et al., (2022) showed that sustainability reporting by companies result in a high financial performance of a firm. On the other hand, Aini and Faisal (2021) by testing the effect of environmental performance towards financial performance the result showed insignificant effects. The reason that makes this analysis intriguing is the inconsistency in the literature's conclusions on how environmental performance really affects firm financial performance in rising nations (Basuony et al., 2023). Hence, we go with the majority based on past research results stating our hypotheses.

H₁: There is a positive impact of environmental performance towards firm performance.

b. Board Gender Diversity and Firm Performance

Over the past few decades, women have taken an increasingly prominent role in workplaces, including serving on corporate boards. The presence of women in the board has increased (Mohsni et al., 2021). Gender diversity in a company is an important aspect in developing a company, this can create an increase in contribution with the number of alternatives considered and it can affect the creativity and quality of products (Eliya & Suprpto, 2022). Rubino et al. (2021) stated that there is a significant relationship between both independent and executive female directors towards firm performance. Further, Kabir et al., (2022) also found that having the presence of women on the board has a positive relationship towards a firm's performance. Li and Chen (2018) found that the gender diversity of a firm's board members has a significant impact towards a firm's performance but that is only if the firm size is less than a certain value. Differently, Comi et al. (2020) researched the effect of gender diversity towards firm performance in European countries and found a negative impact of gender towards firm performance in France and also Spain. Perhaps more importantly, gender diversity aids employers in luring and keeping exceptional women in a labor force where the proportion of women is growing at an exponential rate. It might also serve as a good example for other women in middle and lower management positions inside organizations. Consequently, one of the key components of business plans for organizations that wish to flourish and have an impact is having a diverse board of directors (Li & Chen, 2018).

Following Zhang (2020) that found that the relationship between women and a firm's performance varies between countries. Zhang (2020) Also discussed the significance of the social backdrop in evaluating the gender diversity of the board. However, firms still hire more men than women to occupy the decision-making positions within the firm which may provide more significant opportunities for professional development for men while women are still given positions that reduce the opportunities they have to develop their careers (Tania & Hesniati, 2022). The varying results of previous studies is the reason for this study to bring board gender diversity into research once again. Boards that have a majority of females on board tends to also have lower agency costs (Simionescu et al., 2021). Board gender diversity can also be used to measure the firm's agency costs.

H₂: There is a positive impact of board gender diversity towards firm performance.

c. Institutional Ownership and Firm Performance

Institutional investors have grown to be significant participants in today's financial markets over time. (Milena & Jana, 2018). Institutional investors have one thing in common, and that is that they are all legal entities. Large entities usually employ analysts to do detailed research on a company's financial standings before purchasing their stock. (Milena et al. (2018) stated that the structure of the ownership influences firm performance in many ways based on the differences in shareholder equity, different degrees of concentration and ability to control the managers.

Abedin et al. (2022) also demonstrated a positive association between institutional shareholding and performance. There are a few advantages of institutional ownership for the firm. First, when large owners benefit from a well performing company, they will have a greater incentive to monitor. Secondly, fewer costs have to be spent to manage oversight activities with the shareholders if ownership is larger. Lastly, as institutions have larger shares, it would be expensive to sell the shares, thus they will want to monitor the managers more actively. Kajim, (2020) found no significant effects of institutional ownership towards firm performance but he stated that it doesn't mean institutions fail to do their job fully. Satt et al., (2021) discovered a negative impact instead between the institutional ownership of a firm towards it's performance regardless of the government affiliation of the institutions. Similarly, a research on shipping companies listed in the U.S. also found a negative impact of institutional ownership towards firm performance (Tsouknidis, 2018). The varying results of previous literature motivates further research with different sample firms.

H₃: There is a positive impact of institutional ownership towards firm performance.

d. Agency Cost and Firm Performance

The agency theory addresses conflicts of interest between principles and agents, as well as asymmetry in information between managers and shareholders, whenever a firm's managers are incentivized to act, their firm's agency costs may rise (Baykara, 2021). Thi & Khuyen (2021) found that in the food and beverage industry, total asset turnover has a positive impact on the firm's performance when measured by ROA. Having a high value of total asset turnover means lower agency costs since there are less conflicts between the stakeholders and the managers. The managers will then have more resources to work with to increase profitability, thus increasing total asset turnover. Based on Hoang, Tuan, van Tue Nha, & Phuong's (2019) research results, agency costs, when measured by asset utilization ratio, and also the selling, general, and administrative expenses (SG&A) weighted by net sales, have an insignificant impact towards firm performance when measured by the firm's return on assets and return on equity ratios. Similarly, Baykara (2021) found that statistically the influence of agency costs towards a firm's performance is insignificant.

Kusumadewi and Wardhani (2020) on the other hand, stated that not all agency costs impact firm performance negatively, they can have positive effects as well as having no effect at all. While Linda et al. (2023) stated that low agency costs can lead to less free cash flow used for personal issues therefore it improves company performance. Due to the

varying results of previous studies and also the difference in industries analyzed, this is the gap that this study aims to fill specifically using the energy industry.

H₄: There is a positive impact of agency costs towards firm performance.

e. Board Environmental Committee and Firm Performance

The Board Environmental Committee was formed as a green board committee with the goal of looking at issues that impact the financial, social, and environmental aspects of performance. This committee's duties may include developing and putting into practice strategic sustainability strategies to strengthen bonds with the company's stakeholders. (Shah et al., 2021). Almaqtari et al., (2023) claims that the board environmental committee improves the boards effectiveness towards ESG and also increases a firm's ESG performance. Meanwhile, Mediaty et al., (2023) stated that the characteristics of the board that show concern towards the environment influences a firm's financial performance. The existence of the board environmental committee will enhance a firm in doing more sustainable operations that leads towards attaining greater financial performance (Shah et al., 2021). Prior studies have found effects of the board environmental committees and their effect on environmental – social performance but effects towards financial performance have yet to be explored (Biswas et al., 2018). Thus, the following hypothesis is created.

H₅: There is a positive impact of board environmental committee towards firm performance.

Conceptual Framework

The conceptual framework depicts the relationship between agency costs, board environmental committee, board gender diversity, environmental performance, and institutional ownership towards firm performance.

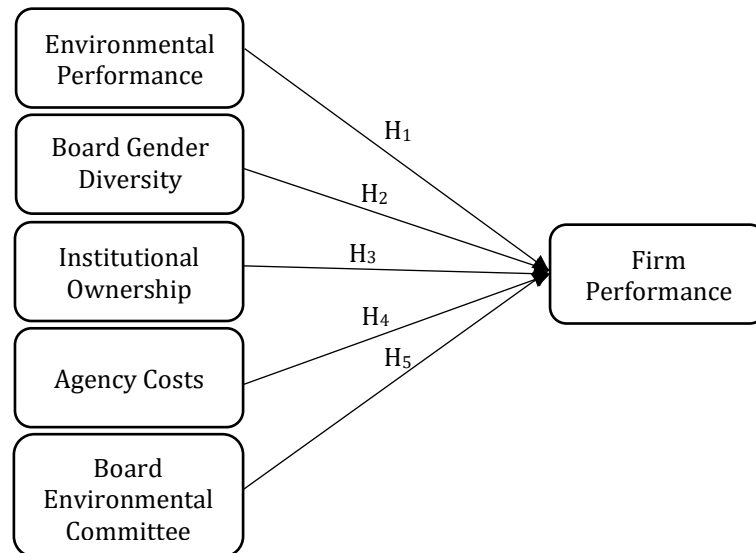


Figure 1. Conceptual Framework
Source: Authors' Creation (2025)

2. METHODS

This study is an empirical study examining the influence of, environmental performance, agency costs, board environmental committee, board gender diversity, and institutional ownership towards a firm's performance. The database of this research consists energy sector firms listed in the Indonesian Stock Exchange (IDX) from 2018 to

2022 (past five years). The sample selection used a purposive sampling method with the following criteria: (1) energy companies that publish an annual report every year from 2018 to 2022, (2) energy companies that publish a sustainability report every year from 2018 to 2022, (3) energy companies that present complete data needed based on the research variables. The final sample was funneled down to 52 sample firms due to the fact that some of the firms lack both sustainability reports, financial reports and data during all five years.

The analysis will be done using a panel data regression as well as cross sectional analysis using the measurements of 5 independent variables towards firm performance measured by ROA of the company. The following model resembles the relationship between the independent variables towards firm performance. Correlation test will be held and after the correlation matrix, a panel data regression will be done. For this test, a pooled-, Common-effects, Fixed-effects, and Random-effects will be used. A Chow test, Hausman test, and a Breusch and Pagan Langrangian multiplier test will be done in order to find the model that best suits the data.

Table 1. Measurement of Variables

Variable	Measurement Formula	Source
Firm performance	Firm performance is measured by using Return on Assets. (Net Income after Tax/ Total Assets).	(Hoang et al., 2019)
Environmental Performance	Total number of Environmental GRI standards reported by the company divided by 37 items on Environmental GRI Standards measurement.	(Orazalin et al., 2024)
Board gender diversity	Total number of women on the board divided by the total number of board members	(Kabir et al., 2022)
Institutional ownership	This variable will reflect the percentage of shares held by institutional owners.	(Kajim, 2020)
Agency cost	AC (Total asset turnover = Net sales/Average total asset)	(Thi and Khuyen, 2021)
Board Environmental Committee	Dummy value of 1 if there is a board environmental committee and a value of 0 if otherwise	(Gerged et al., 2023)

Source: Authors' Creation

3. RESULT AND DISCUSSION

Descriptive Statistics

Table 2. Descriptive Statistics

	N	MIN	MAX	MEAN	STD. DEV
ROA	260	-1.12	.62	.0381	.17172
EP	260	.00	.97	.2130	.23589
BGD%	260	.00	.67	.0948	.15400
BGDW	260	.00	3.00	.3846	.64437
IO	260	.00	1.00	.5939	.30531
AC	260	.00	9.24	.6370	.75206
BEC	260	.00	1.00	.1769	.38234

Source: Data Processed (2024)

The table above shows the descriptive statistics for the sample used. The starting amount of firms were 62 which were funneled down to 52 firms due to the lack of sustainability and annual reports of the firms. The data used in this analysis was taken from the last 5 years of reporting from 2018 to 2022 which led to 260 observations. The table

also shows the lowest till the highest data range, the mean, and also the standard deviation for all the variables. The dependent variable measurement is ROA which is the company's return on assets, with the minimum value of ROA being -112% and the maximum value being 62% with the mean ROA being 3.81% meaning the firms that were analyzed in this research having a 3.81% return for every asset owned and the standard deviation of ROA being 17.17%. A higher value of the standard deviation meaning that the data is more spread out rather than a lower value which means the data is pretty consistent.

The environmental performance variable was measured by number of environmental GRI standards reported by the companies. The minimum value of environmental performance is 0% while the maximum being 97%. The mean value of environmental performance is 21.30% that illustrates that the companies analyzed on average report about 21.30% of 37 Environmental GRI standards, and having a standard deviation of 23.59%. The board gender diversity variable was measured by two different ways namely the percentage of women on board and also the amount of women on board. With the lowest percentage of women on board being 0% and the highest being 67%, and having a mean value of 9.48% that means 9.48% of the analyzed companies board of directors are women. The standard deviation of the percentage of women on board being 15.40%. If measured by the amount of women on board, the minimum value is 0 women on board and the maximum value is 3 women on board, having an average of less than 1 women on board for every company analyzed. The standard deviation value of the amount of women on board results in 64.44%.

Institutional ownership is calculated by the amount of shares owned by institutions with the lowest value being 0% and the highest value being 100%, the mean of institutional ownership variable is 59.39% which illustrates that 59,39% shares of the companies analyzed are owned by institutions and the standard deviation having a value of 30.53%. The agency costs variable was measured by the total asset turnover of the company having a minimum value of 0 and a maximum value of 9.24 while the mean of the agency costs variable being 0.64 which means that the companies in the energy sector generate an average of 0.64 sales for every asset they own. Lastly is the standard deviation value of the agency costs variable being 75.21%. The last variable, board environmental committee is measured by a dummy variable with the existence of the board environmental committee in the company being 1 and 0 otherwise. Having a minimum value of 0 and maximum value of 1. On average, 17.69% of the companies analyzed have a board environmental committee in the company and the standard deviation value being 38.23%.

Variable Correlation

Table 3. Correlation Table

	ROA	EP	BGD%	BGDW	IO	AC	BEC
ROA	1.000						
EP	0.330	1.000					
BGDW	-0.008	0.011	1.000				
BGD%	-0.060	-0.065	0.898	1.000			
IO	0.030	0.102	-0.147	-0.102	1.000		
AC	0.314	0.223	0.044	-0.066	-0.140	1.000	
BEC	0.368	0.337	-0.121	-0.157	-0.017	0.221	1.000

Source: Data Processed (2024)

The correlation test reveals significant insights into the relationships among various variables and their influence on the dependent variable, which is Return on Assets (ROA). This metric serves as a crucial indicator of a company's profitability relative to its total assets, thus providing a clear picture of financial efficiency. In this analysis, we identified four independent variables that exhibit a positive correlation with ROA, indicating that their increases are associated with an enhancement in ROA performance. The first variable, Environmental Performance (EP), demonstrates a correlation value of 0.330. This suggests

that firms with superior environmental practices and sustainability initiatives tend to achieve better financial outcomes, highlighting the increasing importance of corporate social responsibility in today's business landscape. Next, we examine Institutional Ownership, which is reflected by a correlation value of 0.030. While this value is modest, it implies that companies with a higher proportion of shares held by institutional investors may experience a slight improvement in ROA. This could be attributed to the fact that institutional investors often advocate for better governance and strategic decision-making within the firms they invest in. The third variable, Total Asset Turnover (AC), exhibits a correlation of 0.314. This metric measures the efficiency of a company's use of its assets to generate sales revenue. A higher total asset turnover indicates that the company is effectively utilizing its assets, which in turn positively influences its profitability as measured by ROA.

Furthermore, the presence of a Board Environmental Committee (BEC) correlates positively with ROA at a value of 0.368. This relationship underscores the notion that having a dedicated group overseeing environmental strategies may not only enhance a company's sustainability efforts but also contribute to its overall financial success. Conversely, the analysis identifies Board Gender Diversity as an independent variable that demonstrates a negative relationship with ROA. Specifically, the variable representing the number of women on the board (BGDW) has a correlation value of -0.008, while the percentage of women on the board (BGD%) registers a value of -0.060. These results suggest that, in this particular dataset or context, an increase in female representation on the board does not correlate positively with the company's financial performance as measured by ROA. This finding may prompt further investigation into the dynamics of board composition and its varying impacts on organizational outcomes, as the relationship between gender diversity and financial performance can be multifaceted and influenced by numerous factors, including industry norms and company culture. In summary, the correlation test provides a comprehensive overview of how different variables relate to ROA, revealing both positive and negative correlations that can inform future research and strategic decisions within organizations seeking to enhance their financial performance.

Regression Analysis

Table 4. Chow Test Results

Effects Test	Statistic	d.f.	Prob.
Cross-section Chi-square	157.266441	51	0.0000

Source: Data Processed (2024)

The common effect model was computed first followed by the fixed effect model and the random effect model. Then the chow test was used to determine which model suits the data better between the common effect model or the fixed effect model and the random effect model. Since the value of probability shows a value <0.05, then the model that suits the ROA data better is either the fixed effect model or the random effect model which will be determined by a Hausman test.

Table 5. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	11.926488	8	0.1545

Source: Data Processed (2024)

The hausman test was computed and showed that the value of probability is >0.05 for ROA so the langrangian multiplier test needs to be run to determine whether the better suited model is the common effect model or the random effect model.

Table 6. Langrangian Multiplier Test Results

	Cross-section	Time.	Both
Breusch-Pagan	38.62085 (0.0000)	0.263829 (0.6075)	38.88468 (0.0000)

Source: Data Processed (2024)

The Lagrangian multiplier test was computed and showed a striking probability of 0 for Return on Assets (ROA), as indicated in the Breusch-Pagan cross-section column, which is notably less than 0.05. This outcome strongly suggests the presence of heteroscedasticity in the data, indicating that the variance of errors varies across observations, thereby violating one of the key assumptions of ordinary least squares regression. Given this evidence, it becomes clear that the best model suited for the data is the random effects model, which is designed to account for unobserved heterogeneity when the data involves multiple observations over time for the same entities. The random effects model allows for the inclusion of both time-invariant and time-varying variables, making it particularly advantageous in panel data analysis where individual-specific characteristics might influence the dependent variable, yet remain unobserved. By leveraging this approach, we can obtain unbiased estimates while efficiently utilizing the available data, particularly when the assumption of independence across cross-sectional units is violated.

Table 7. t-Test Results

Variable	t-Statistic	Prob.	Description
EP	2.472484	0.0141	Significant (+)
BGDW	0.099832	0.9206	Unsignificant
BGD%	0.060024	0.9522	Unsignificant
IO	-0.036123	0.9712	Unsignificant
AC	3.442987	0.0007	Significant (+)
BEC	2.465164	0.0144	Significant (+)

Source: Data Processed (2024)

The effect models for the t-test was selected and showed the significance of the independent variables towards firm performance measured by ROA. EP is proven to have a significant positive relationship with ROA, indicating that firms that prioritize environmental performance not only contribute positively to ecological sustainability but also enhance their financial performance metrics. This significant relationship between environmental performance and firm performance, as measured by ROA, is in line with research conducted by Ghardallou (2022), which posited that a firm's commitment to environmental performance has a robust and favorable effect on its financial outcomes. Similarly, the findings of Ismail et al. (2022) support this assertion by demonstrating that sustainability reporting, when effectively implemented, correlates with improved financial performance for firms. This correlation suggests that when a firm exhibits strong environmental performance, it attracts the interest of green investors—individuals or institutions focused on sustainable and responsible investment. Consequently, this influx of green capital can empower the firm, providing it with the necessary resources to enhance productivity, innovate, and implement sustainable practices, further reinforcing its competitive edge in the market.

In contrast, neither BGDW nor BGD% demonstrated significant effects on ROA. This finding echoes the research conducted by Comi et al. (2020), which explored the influence of gender on firm performance across several European nations, notably France and Spain, and concluded that there were no significant correlations between gender representation and financial performance in those contexts. This lack of significance might be particularly pronounced within the energy sector in Indonesia, where there remains a notable underrepresentation of women in leadership and board positions. As a result, the impact of gender diversity on the financial performance of firms in this sector appears minimal,

potentially limiting the diversity of perspectives and innovative strategies that could enhance overall corporate performance.

Moreover, the variable of institutional ownership (IO) also does not exhibit a significant effect on ROA, aligning with the findings of Kajim (2020), who similarly reported no substantial impact of institutional ownership on firm performance. This suggests that the presence of institutional investors in energy sector firms does not significantly influence their financial outcomes, potentially due to a lack of active engagement or differing priorities between institutional shareholders and management.

When examining the measurement of agency costs, the t-test results indicate that the total asset turnover ratio has a significant positive relationship with ROA. A higher total asset turnover ratio typically signifies lower agency costs, which implies that as total asset turnover increases, so too does ROA. This observation is consistent with classical economic theories that posit that a reduction in conflicts between shareholders and managers leads to improved utilization of the company's assets, thereby enhancing profitability. When managers are aligned with shareholder interests, they are more likely to optimize asset use to drive financial success. This relationship is further supported by the research of Thi & Khuyen (2021), which found that in the food and beverage sector, agency costs positively influence firm performance as measured by ROA. Interestingly, it also relates to the work of Kusumadewi et al. (2020), which revealed that not all agency costs negatively affect firm performance; some costs may yield neutral or even positive outcomes, depending on the operational context and management strategies in place.

Finally, the presence of a Board Environmental Committee (BEC) is also shown to have a significant positive effect on ROA. Previous studies, such as that conducted by Mediaty et al. (2023), have highlighted that board characteristics that display a commitment to environmental concerns can significantly influence a firm's financial performance. The role of an environmental committee within a firm's governance structure is crucial, as it serves not only to oversee and enhance the firm's environmental performance but also to ensure that such performance translates into financial benefits. By prioritizing environmental stewardship, firms can cultivate a reputation for sustainability, which can attract customers, investors, and partners who value corporate responsibility. This holistic approach to governance ultimately leads to improved financial outcomes, demonstrating the intricate link between environmental initiatives and robust firm performance.

Table 8. R-squared Test Results

R-squared	0.132741
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Source: Data Processed (2024)

The R-Squared Test measures the proportion of the dependent variable that can be explained by the independent variables. In this case, the independent variables used in this research could explain firm performance by 13.3% when measured by Return on Assets (ROA). This indicates that a relatively modest portion of the variance in ROA can be attributed to the factors analyzed in this study, highlighting a significant gap in our understanding of the financial dynamics at play. The rest of the variance, amounting to 86.7%, remains unexplained by the variables included in this research, suggesting that there are additional factors influencing firm performance that have not been accounted for in this analysis. This discrepancy invites further inquiry into what those unexamined elements might be. It raises important questions about whether external economic conditions, such as market trends, consumer behavior, and competitive landscape, play a more substantial role than initially assumed. Additionally, internal factors, including management practices, corporate governance, and employee engagement, could also significantly impact financial outcomes. The relatively low R-squared value serves as a reminder that while statistical tools like the R-Squared Test are valuable for understanding relationships between variables, they do not tell the whole story.

To address this issue, future research could explore a broader range of independent variables, including qualitative aspects like company culture and innovation capabilities, which may provide deeper insights into firm performance. Moreover, employing advanced statistical techniques, such as multivariate analysis or machine learning models, might yield a more comprehensive understanding of the underlying factors that contribute to ROA. Ultimately, recognizing the limitations of the current analysis is crucial for developing a more nuanced view of how various elements interact to shape the financial health of firms, ensuring that both researchers and practitioners can make informed decisions based on a holistic understanding of the data.

4. CONCLUSION

This research aims to investigate the impact of environmental corporate governance towards firm performance of energy companies listed in the Indonesian Stock Exchange (IDX). It is found that environmental performance can improve the firms financially if measured by the firm's return on assets. Although firms would have to incur costs initially, a greener company would likely attract more investors to invest thus the benefits exceed the initial costs. Regarding how board gender diversity affect firm performance, our research found that board gender diversity doesn't effect the firm performance in the energy sector of Indonesia. It is possible that this outcome is due to the fact that several companies operating in the energy sector in Indonesia still have a limited number of women serving on their boards of directors, which means that they do not make a significant impact on the finances of the company. Whether a company in the energy sector of Indonesia is owned by an institution or not does not influence their firm's performance in any way. The reason behind this might be that the institutions owning part of the companies in the energy sector don't really contribute at all or don't really contribute enough to bring out a difference that could make the company profit better than the companies that aren't owned by institutions

It is also found that agency costs do not improve firm performance, in fact it does the opposite by decreasing the firm performance. In this research, high total asset turnover numbers which mean low agency costs significantly improves the firm's return on assets. This is because having low agency costs means that the managers don't have to worry that much about their relationship with the stakeholders because there is little conflict between the two, which means that the managers can spend more resources on improving profitability that improves the firm's performance. Having environmental committees on board also significantly boosts the firms financially. Again, a greener and more sustainable company would likely attract more investors to invest in the company so, maintaining the company's environmental sustainability and performance is a must and that is where the environmental committees on board come in. They fulfill a role in the board that requires them to plan strategies and projects to increase environmental sustainability.

The limitations of this research are multifaceted and warrant careful consideration to fully understand the scope and implications of the findings. First and foremost, the research is constrained by the choice of variables; while the return on assets (ROA) is a commonly used metric for assessing firm performance, it is important to acknowledge that there are numerous other quantitative and qualitative measures that could provide a more holistic view of a firm's operational efficiency and profitability. Metrics such as return on equity (ROE), earnings before interest and taxes (EBIT), or even customer satisfaction indices could yield valuable insights that are currently overlooked.

Moreover, the research exhibits a relatively low R-squared value, which indicates that a significant portion of the variability in the dependent variable remains unexplained. This suggests that there are potentially many other crucial variables that could enhance the explanatory power of the model. Future research could explore these additional factors,

including market conditions, regulatory influences, and technological advancements, which may significantly impact firm performance yet were not captured in this study.

Additionally, the sample in this research is restricted solely to energy companies listed on the Indonesia Stock Exchange (IDX), and only those firms that have provided comprehensive annual reports for the last five years are included. This limitation not only narrows the generalizability of the findings but also excludes a host of other companies within different sectors that may exhibit different performance trends. To enrich the analysis and improve the robustness of the conclusions drawn, it is suggested that future studies broaden the sample to encompass all firms listed on the IDX, thereby allowing for a more comprehensive examination of firm performance across various industries.

Furthermore, this research encourages the exploration of alternative measurements and the inclusion of additional variables that were not considered in this analysis. By integrating a wider array of performance indicators and contextual factors, subsequent studies could paint a more detailed picture of the dynamics influencing firm success and sustainability in the competitive landscape.

Lastly, it is imperative for firms within the IDX energy sector to not only maintain but also actively enhance the significant factors identified in this research. Continuous improvement efforts, such as investing in innovative technologies, optimizing operational efficiencies, and fostering a culture of excellence, will be essential for these firms to achieve sustained financial growth and remain competitive in an ever-evolving market. By addressing these limitations and exploring new avenues for research, we can pave the way for more nuanced understandings of firm performance and its determinants.

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