

Does board gender diversity play an important role in environmental and corporate performance?

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Abstract

This research investigates the impact of Return on Assets (ROA), Debt to Equity Ratio (DER), Sales Growth, and Gender Diversity on Environmental Performance (EP) among 75 companies listed on the Indonesia Stock Exchange participating in the PROPER program from 2019 to 2022. The study employs a random effects model. The findings indicate that ROA, DER, Sales Growth, and Gender Diversity significantly influence EP. Specifically, Firm Size (FZ) moderates the impact of DER on EP. However, Firm Size does not significantly moderate the effects of ROA, Sales Growth, and Gender Diversity on EP. The research provides insights into factors contributing to the financial performance of companies and the moderating role of firm size. The novelty of the study lies in the moderating role of firm size in the relationship between ROA, DER, Sales Growth, and Gender Diversity with environmental performance. The research contributes to legitimacy, stakeholder, and agency theories. Policymakers can leverage these insights to formulate strategies that encourage corporate sustainability. This study offers valuable information for companies aiming to enhance both environmental and financial performance, ultimately contributing to broader societal well-being.

Keywords: Environment Performance; Financial Performance; Firm Size; Gender Diversity

Abstrak

Penelitian ini menginvestigasi dampak Return on Assets (ROA), Debt to Equity Ratio (DER), Pertumbuhan Penjualan, dan Keanekaragaman Gender terhadap Kinerja Lingkungan (EP) pada perusahaan terdaftar di Bursa Efek Indonesia yang berpartisipasi dalam program PROPER dari tahun 2019 hingga 2022. Penelitian ini menggunakan model random effects. Hasil penelitian menunjukkan bahwa ROA, DER, Pertumbuhan Penjualan, dan Keanekaragaman Gender memiliki pengaruh signifikan terhadap EP. Secara khusus, Ukuran Perusahaan (FZ) memoderasi dampak DER pada EP. Namun, Ukuran Perusahaan tidak secara signifikan memoderasi efek ROA, Pertumbuhan Penjualan, dan Keanekaragaman Gender pada EP. Penelitian ini memberikan wawasan tentang faktor-faktor yang berkontribusi terhadap kinerja keuangan perusahaan dan peran moderasi dari ukuran perusahaan. Kebaruan penelitian terletak pada peran moderasi ukuran perusahaan dalam hubungan antara ROA, DER, Pertumbuhan Penjualan, dan Keanekaragaman Gender dengan kinerja lingkungan. Temuan penelitian memberikan kontribusi pada teori legitimasi, stakeholder, dan agensi. Pembuat kebijakan dapat menggunakan wawasan ini untuk merumuskan strategi dalam mendorong keberlanjutan perusahaan. Penelitian ini memberikan informasi berharga bagi perusahaan yang bertujuan meningkatkan kinerja lingkungan dan keuangan, yang pada akhirnya berkontribusi pada kesejahteraan masyarakat secara lebih luas.

Kata kunci: Diversitas Gender; Kinerja Keuangan; Kinerja Lingkungan; Ukuran Perusahaan.

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Indonesia implemented stringent environmental rules in response to public and stakeholder demands to curb environmentally harmful industrial practices. The primary foundation is Law No. 32 of 2009, which specifically emphasises the preservation of the environment. The Indonesian government's involvement in international agreements like the Paris Climate Change Agreement and the Kyoto Protocol serves as evidence of its commitment to reducing greenhouse gas emissions for sustainable development (Alshuwaikhat & Abubakar, 2008; Islam & Wang, 2023). The duty for these commitments has transitioned from being exclusively held by governments to being jointly shared with enterprises (Berger-Walliser & Scott, 2018; Helberger et al., 2018; Partiti, 2020). The aforementioned action highlights the challenge of achieving a harmonious equilibrium between economic growth and environmental preservation (Ajmal et al., 2018; Klarin, 2018). Directors bear a heightened responsibility to establish organisational strategies that are in line with these objectives, due to the active role that corporations in both developing and developed nations play in mitigating environmental harm and managing its aftermath. The given references are from the publications of (Ren et al., 2018; Roscoe et al., 2019).

To achieve sustainable growth, companies must maintain legitimacy. Legitimacy theory emphasizes that fulfilling social and environmental obligations is critical to establishing and maintaining credibility and acceptance. Fulfilling obligations contributes to the formation and preservation of the company's reputation and acceptance (Lindawati & Puspita, 2015; Wijaya & Kuang, 2023). Signaling theory shows that companies meet stakeholder expectations regarding social and environmental accountability with environmental performance (Lindawati & Puspita, 2015; Wijaya & Kuang, 2023). Companies face difficulties in aligning green policies with financial expansion, resulting in burdensome gaps. The problem lies in the lack of involvement in sustainability initiatives such as the PROPER program. Environmental violations pose significant dangers. Its resolution requires the involvement of all relevant parties which highlights the urgent need to address this problem (Arvirianty, 2019; Lidyana, 2022). Companies face significant financial risks due to the gap between environmental sustainability and financial performance (Ruan & Liu, 2021; Tan & Zhu, 2022). Companies that do not manage their environment effectively can face financial problems, such as fines and

litigation costs (Alboiu & Walker, 2019). The Indonesian government's initiative through the PROPER program, supervised by the Environmental Service, appreciates companies' environmental compliance. However, because it is optional, more involvement is needed, especially from companies listed on the Indonesia Stock Exchange, to overcome potential environmental problems (Fatchan & Trisnawati, 2018; Gatti et al., 2019).

Re-examining some of the previous research is only centered directly related to financial performance on environmental performance with different opinions. According to (Horváthová, 2012), financial development and environmental protection schemes significantly improve China's environmental performance, and offer new policy implications for developing countries. It is clear that environmental efficiency and ROA have a positive relationship (Lucas & Noordewier, 2016). Additionally, there is a connection between environmental performance and business leverage (Santoro & Chakrabarti, 2002). Corporate environmental cost expenditure has a positive impact on environmental and corporate performance (Ifada & Jaffar, 2023). In contrast, Ju et al. (2023) explained that financial development has a detrimental impact on environmental sustainability. Mechanistic analysis shows that corporate financialization performance not only creates long-term value risk through crowding out real capital and depriving green resources (Yang & Li, 2023). Bassetti et al. (2021) revealed that companies that prioritize environmental concerns show a higher success rate in promoting future economic development.

Gender diversity on boards of directors plays an important role in influencing corporate environmental performance, becoming a focus of attention for researchers and practitioners. In an era of emphasis on sustainability and social responsibility, understanding how gender roles on boards can shape and improve corporate environmental performance is crucial (Post et al., 2015).

Nyumba et al. (2018) highlighted the impact of firm size in this context. This study evaluates the effect of gender diversity in the board of directors on environmental performance, considering company size as a regulatory factor, as has been argued by several previous researchers (Ciriyani & Putra, 2016; Effendi et al., 2012; Rinsman & Prasetyo, 2020; Siregar & Kusumawardhani, 2023). This fills the gap by integrating the moderating concept of company size as an innovation, in line with the theories of legitimacy, stakeholder, and agency (Baron & Kenny, 1986). The results provide holistic and relevant insights into the role of firm size in the context of environmental performance.

The purpose of this study is to investigate the impact of financial performance and gender diversity in the board of directors, with firm size as moderating factors, on the environmental performance of non-financial firms. The benefits include providing new insights for companies and governments in developing effective environmental policies. This research is expected to provide new insights into the integration of sustainable practices in corporate management, in line with social values and societal expectations.

LITERATURE REVIEW

Legitimacy Theory

Legitimacy theory is an interesting conceptual framework in the context of corporate environmental performance (Holly et al., 2023). According to legitimacy theory, business and society should meet the needs of society and positively affect the environment and society while still providing value to investors (Shocker & Sethi, 1973). Implementing this measure will increase the credibility of the organization and provide favorable outcomes for the business plan and long-term viability of the company. The company's commitment to environmental performance is anticipated to increase the legitimacy of the company and provide favorable results in the future (Khattak, 2021). This study uses legitimacy theory as a foundation to evaluate the social legitimacy and sustainability of Indonesian non-financial companies that report their commitment to environmental sustainability through the Ministry of Environment and Forestry's PROPER program (Rusmana & Tanjung, 2020; Utomo et al., 2020). Companies that receive high scores in the PROPER program are more likely to gain better legitimacy in society and have a higher probability of surviving in the long term.

Stakeholder Theory

Stakeholder theory offers an important perspective in linking financial performance with the environmental performance of an organization (Freeman & Evan, 1990). According to this theory, stakeholder groups, such as investors, consumers and society, have a major role in determining and influencing the success of companies. In the context of financial and environmental performance, companies tend to perform better financially when they meet the expectations and needs of stakeholders related to the environment (Sampong et al., 2018). As such, in-depth research into these linkages can provide valuable insights in supporting sustainable business practices (M. T. Lee & Raschke, 2023).

Agency Theory



Agency theory plays a key role in understanding the relationship between gender diversity and environmental performance in an organization (Martín & Herrero, 2019). The concept of agency highlights how the actions and decisions of individuals, particularly in gender-diverse boards of directors, can influence positive changes to environmental practices (Guping et al., 2020). By recognizing and understanding the role of such agents, in-depth research on gender diversity can provide insights into how this diversity can motivate decision-making that supports sustainable environmental practices.

Social Theory of Gender

When there is a lack of gender variation, individuals who possess specific features, such as their gender, may have an advantage and can influence group behavior (Schwab et al., 2016). Overall, individuals who are considered “tokens” exhibit different behaviors and are more likely to engage in deviant acts compared to those who are not “tokens” (Liao et al., 2004). These behaviors include emotions of alienation and a pessimistic work disposition (Tsui et al., 1991). This emphasizes the impact of societal norms, cultural values, and power systems on how individuals perceive and express their gender identity (Abed et al., 2019; Eliason & Schope, 2007).

According to research using the social theory of gender (Birindelli et al., 2019; Elmagghi et al., 2019; Galbreath, 2011; Rao & Tilt, 2016), gender roles on boards of directors or in leadership positions within companies can impact organizational culture and decision-making processes related to environmental performance. This research seeks to examine the impact of gender differences in leadership positions on the implementation of business environmental sustainability strategies. Therefore, the social theory of gender is used to enhance the understanding of how gender identification influences the formulation and orientation of organizational policies, which include corporate efforts in upholding environmental sustainability (Gallego-Sosa et al., 2020; Kyaw et al., 2022).

Environmental Performance

Environmental performance refers to an organization's actions and impact on the environment. It includes sustainable practices, compliance with environmental regulations, and efforts to conserve natural resources (Ilinitch et al., 1998; Nisar et al., 2021). Environmental performance evaluation involves measuring the impact of business activities on ecosystems, greenhouse gas emissions, waste management, energy efficiency, and participation in sustainability initiatives (Escrig-Olmedo et al., 2017). Good environmental performance reflects a company's responsibility to ecology and its contribution to sustainable development,

while maintaining a balance with economic growth. PROPER, an Indonesian government initiative, assesses and ranks companies based on environmental performance (Devie et al., 2019). With a focus on waste management, energy efficiency, and regulatory compliance, the program encourages green businesses. With positive incentives and increased transparency, PROPER motivates companies for sustainable operations, creating a progressive step in achieving a balance between economic growth and environmental preservation (Ilinitich et al., 1998; Laporte et al., 2021; Massaro et al., 2022).

The Effect of Return on Assets on Environmental Performance

To assess the influence of finance on environmental performance, Return on Assets (ROA) is a relevant proxy for financial performance. ROA measures a firm's capacity to generate profits based on its assets. It provides a snapshot of how resource allocation can affect profitability. Due to the strong link between finance and the environment, ROA is critical for assessing how a company's financial practices align with its dedication to environmental responsibility and sustainability (Porter & Linde, 1995). Analyzing an organization's ROA is one method to assess its capacity to create value from its assets. This is calculated by dividing the net income of a business by the average amount of assets. The results of the study conducted by Haninun et al. (2018) indicate a significant positive relationship between financial performance, environmental performance, and environmental transparency. The relationship between environmental responsibility performance and firms' ROA is positive and statistically significant (K.-H. Lee et al., 2014).

H₁: Return on Assets has a positive effect on environmental performance.

The Effect of Debt to Equity Ratio (DER) on Environmental Performance

One financial measure showing how much debt a company uses to support its business activities is Debt to Equity Ratio (DER) (Arhinful & Radmehr, 2023). In this framework, DER serves as a very important metric, indicating the extent to which a company's financial strategy can impact environmental practices and outcomes. Intrinsic value is the common interest of all stakeholders (Freeman & Evan, 1990). The framework is constructed upon the company's environmental strategy, with 21 key objectives suggested to guarantee the creation of a comprehensive report and acknowledgment of all important environmental actions undertaken by the organization (Azzone et al., 1996). The strong correlation between DER and environmental sustainability highlights its importance as a representative of financial performance (FP), which has an important role in aligning financial activities with environmental obligations.

H₂: Debt to Equity Ratio has a positive effect on environmental performance.***The Effect of Sales Growth on Environmental Performance***

The environmental role within organizations is significantly affected by sales growth (SGH). Sustainable businesses nowadays have better financial performance (Ameer & Othman, 2012). Based on the hypothesis, higher sales can have a favorable influence on a company's sustainability goals (Sandvik & Sandvik, 2003). Increased sales allow companies to devote more funds to green procedures, green inventions, and sustainable technologies. This has the potential to improve energy efficiency, minimize waste, and enhance the company's sustainability image (Decarolis & Deeds, 1999). As a result, sales growth affects a company's financial performance and its environmental ability to function better. The research conducted by Menguc et al. (2022) demonstrates that proactive environmental strategies are influenced by entrepreneurial orientation, government regulations, and customer sensitivity to environmental issues, leading to increased sales and profit growth. This aligns with the findings of Radhouane et al. (2018) which suggest that companies with better environmental performance tend to experience higher sales or market value.

H₃: Sales Growth has a positive effect on environmental performance.***The Effect of Gender Diversity on Environmental Performance***

Gender diversity improves understanding of environmental implications, highlights sustainability issues, and makes it easier to incorporate multiple perspectives into decision-making processes. Increasing gender diversity on corporate boards can help companies fulfill their social and environmental obligations better, promote inclusion in the workplace, and improve overall environmental performance. Lu & Wang (2021) research reveals a strong correlation between gender diversity and organizational environmental performance scores, especially in businesses that have a large influence on the environment.

This study found a strong positive correlation between gender diversity and environmental innovation. Moreover, we observed that this correlation was especially pronounced in firms with lower profitability and in industries that are highly vulnerable to environmental factors (Ali et al., 2023). Businesses with a higher percentage of female employees face fewer environmental lawsuits (Liu, 2018). Board diversity is linked to increasing board effectiveness in better serving the interests of broader stakeholder groups, supporting many corporate governance and public policy initiatives implemented globally to promote greater gender diversity on boards (Konadu et al., 2022; Tingbani et al., 2020). The

involvement of women on boards is linked to the advancement of proactive environmental initiatives. One of these tactics is pollution avoidance, which has been shown to yield long-term financial performance benefits through persistent competitive advantage (Xie et al., 2023). Gender diversity positively affects business performance through traits, such as openness to negotiation, collaboration, and greater flexibility in professional tasks (Bogdan et al., 2023). Deeper mental rotation abilities and evolved mindsets contribute to supporting environmental knowledge on gender (Miola et al., 2023).

H₄: Gender diversity has a positive effect on environmental performance.

The Moderating Effect of Firm Size on the Impact of Financial Performance Proxies (ROA, DER, SGH) and Gender Diversity on Environmental Performance

The basis for understanding the relationship between business size and environmental sustainability is provided by agency theory and resource theory (Dean & McMullen, 2007; Evans et al., 2017; Jensen & Meckling, 1976; Muradian et al., 2010; Spaargaren, 1997). Agency theory emphasizes that firm size can affect the relationship between financial performance, as measured by three indicators (ROA, DER, SGH), and gender diversity on environmental performance.

Firm size, in this particular situation, acts as a moderator, guiding the influence of financial factors on environmental policy. Resource theory highlights that firm size may indicate the accessibility of resources required to implement sustainability activities (Hoskisson & Hitt, 1999). Both internal and external green supply chain management (GSCM) practices are positively correlated and generally conducive to strong performance. In addition, moderator testing found that factors, such as industry type, ISO certification, export orientation, and cultural characteristics associated with uncertainty avoidance played a role in moderating the relationship between practices and performance (Fang & Zhang, 2018). To help overcome funding issues that hinder CSR and green innovation, appropriate departments should allocate green funds to capital-constrained businesses (Zhang et al., 2020). This hypothesis is supported by research conducted by Humayra et al. (2023), which suggests that company size significantly moderates environmental performance, with different levels of environmental risk management based on company size.

H₅: Company size moderates the effect of ROA on environmental performance.

H₆: Company size moderates the effect of DER on environmental performance.

H₇: Company size moderates the effect of SGH on environmental performance.

H₃: Company size moderates the effect of gender diversity on environmental performance.

METHOD

Research Sample

This study focuses on the manufacturing sector, involving a sample of 458 companies listed on the Indonesia Stock Exchange (IDX) from 2018 to 2022. A total of 377 companies that were not part of the PROPER project and six companies with negative net working capital were eliminated from the sample, leaving 75 companies for analysis. A careful selection method was used to ensure a focus on the relationship between financial performance and sustainability in environmentally conscious companies. This creates a strong basis for a thorough analysis of the correlation between these aspects in the context of manufacturing companies in Indonesia.

Table 1. Selection of Company Sample

Sample Criteria	Total Sample
Non-financial companies listed on the stock exchange and submitting reports for the Indonesia Securities Period of 2018-2022	458
Companies that withdrew from the PROPER program organized by the Ministry of Environment and Forestry between 2018 and 2022	(377)
Elimination companies out of sample, due to negative net working capital	81
The number of companies thoroughly analyzed	75

Source: Processed data, 2023

Measurement of Variables

To assess a company's environmental performance, a number of metrics and indicators relating to sustainable practices are evaluated. Companies in Indonesia may use the PROPER program to assess their environmental management as part of this evaluation process (Hardiyansah et al., 2021; Lu & Herremans, 2019). PROPER assesses companies based on waste management practices, energy efficiency measures, compliance with environmental regulations, and other sustainability initiatives (Solovida & Latan, 2017). These assessments provide a thorough examination of how companies comply with environmental standards and implement sustainable practices (Hardiyansah et al., 2021). Gold and green ratings are awarded to companies that go beyond compliance and cover three criteria: (1) implementing an environmental management system (ISO 14001); (2) using resources; and (3) implementing community development. Criteria that measure a company's compliance with environmental regulations are used for the blue, red and black ratings.

Return on Assets (ROA) is a measure used as a proxy for financial performance. ROA net income is better able to predict future investment returns (Kusuma, 2021). The calculation of profitability using ROA measures the company's effectiveness in generating profits by utilizing its assets (Puspitasari et al., 2019). Assessing a company's ability to generate value from its assets can be done by examining ROA. The calculation involves dividing the net profit of the business by the average total assets (Whittington, 2007). The metric called ROA measures how well a business uses its resources to generate profits. An increase in ROA indicates better use of assets and possibly better management in converting investments into profits (Jizi, 2017). ROA is an important indicator used to evaluate the company's financial performance and efficiency (Hardiyansah et al., 2021; Rokhmawati et al., 2015).

Debt to Equity Ratio (DER) is used as a proxy that measures the proportion of the company's performance that comes from debt compared to equity. The calculation involves dividing the company's total debt by the equity owned by shareholders. DER is an important metric for assessing a company's leverage or financial risk (Nukala & Rao, 2021). A higher DER indicates that most of the company's capital comes from debt, which has the potential to increase returns but also increases financial risk (Puspitasari et al., 2019). On the other hand, a lower DER indicates a higher reliance on equity financing, which signals a possible decrease in financial risk without a decrease in leverage. Investors and analysts often use DER to assess a company's capital structure and risk profile (Hardiyansah et al., 2021).

Sales Growth (SGH) as a proxy for financial performance. SGH refers to the percentage increase in an organization's sales or revenue over a given period, serving as a financial metric to measure this growth. This information offers important insights into a company's ability to increase market share, attract more clients, or introduce new products and services (Foroudi et al., 2017). Analysts, investors, and management evaluate a company's competitiveness and market health by utilizing sales growth as an important performance metric. Positive sales growth is usually seen as a good sign, indicating a successful and potentially growing company, while negative growth may raise concerns about the company's market position and strategy (Kusuma, 2021).

Gender Diversity (GDV) is used to measures the extent to which gender diversity exists within a group or organization. Gender diversity refers to the difference between the number of men and women in a group or organization. Measuring gender diversity involves understanding how evenly men and women are distributed within an entity (Monroe et al., 2008). Some methods of measuring gender diversity include gender ratio, gender diversity

index, and diversity score (Nielsen & Börjeson, 2019). Gender diversity is considered important for creating an inclusive environment, increasing understanding of diverse perspectives, and optimizing organizational performance (Ferrary & Déo, 2023). A focus on gender diversity supports efforts to achieve gender equality and justice in the workplace (Zaid et al., 2020). Measurement of gender diversity can be represented using various methods, such as using the Blau index value for gender diversity ranges from 0 to a maximum of 0.5, which occurs when the board consists of an equal number of men and women. Alternatively, it can be measured by calculating the percentage of women on the board of directors relative to the total number of board members, referring to research by Lu & Herremans (2019).

Firm Size (FZ) serves as the moderating variable in this study. Moderating variables are variables that affect (strengthen or weaken) the direct relationship between the independent variable and the dependent variable (Mustikawati & Cahyonowati, 2015). Total assets, sales, and operating capital are used to calculate firm size. Company profits and their impact on company size are directly proportional to total assets, sales, and company capital (Hidayat, 2019). A firm's size reflects its capacity to access capital markets and obtain external funding, indicating its borrowing potential. Since the value of all assets is seen to accurately represent the size of the business, firm size is determined using log (total assets).

Table 2. Definition of Variables

Variables	Definition
Environmental Performance (EP)	ISO 14001
Return on Assets (ROA)	Net Profit
Debt-to-Equity Ratio (DER)	$\frac{\text{Total Assets}}{\text{Total Debts}}$
Sales Growth (SGH)	$\frac{\text{Total Assets} (\text{Sales } t - \text{Sales } t^{-1})}{(\text{Sales } t^{-1})}$
Gender Diversity (GDV)	$\frac{\text{Number of Women on the Board of Directors}}{\text{Total Members of the Board of Directors}} \times 100\%$ (Alazzani et al., 2017; Lu & Herremans, 2019)
Firm Size (FZ)	$\text{Ln}=\text{Total Asset}$

$$EP = \alpha + \beta_1.ROA + \beta_2.DER + \beta_3.SGH + \beta_4.GDV + \beta_5.SZE + e.....(1)$$

$$EP = \alpha + \beta_1.ROA + \beta_2.DER + \beta_3.SGH + \beta_4.GDV + \beta_5.SZE + \beta_6.ROA*SZE + \beta_7.DER*SZE + \beta_8.SGH*SZE + \beta_9.GDV*SZE + e.....(2)$$

In these equations, EP is the dependent variable representing corporate environmental performance, α is the constant term, FP is financial performance or control (ROA, DER, SGH), GDV is gender diversity, SZE is firm size, and e represents the error term. The interpretation



of these parameters will reveal how much firm size influences the relationship between the dependent variables (EP) and the corresponding independent variables (ROA, DER, SGR, GDV).

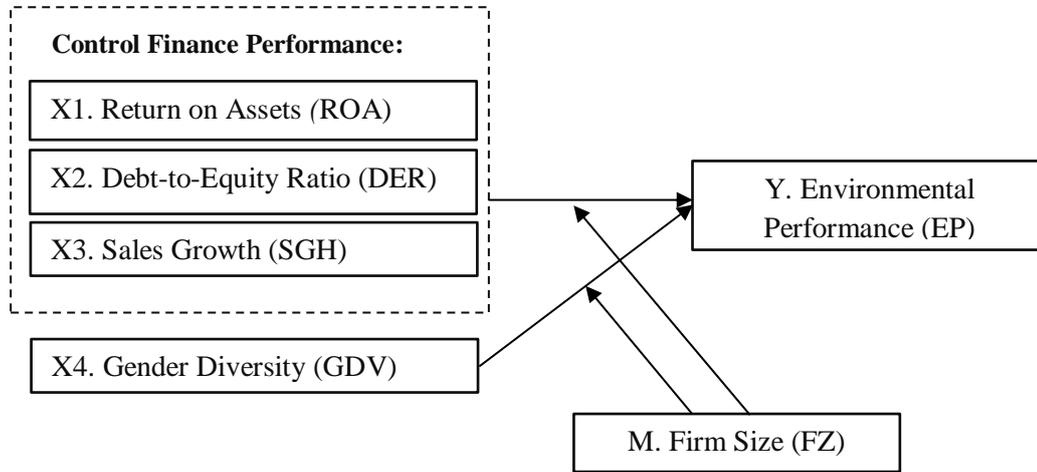


Figure 1. Conceptual Framework

RESULTS AND DISCUSSION

Descriptive Analysis

The data distribution involves using descriptive statistical tests. These tests serve as an initial instrument to characterize the form of the data (Cooper & Schindler, 2014). The descriptive statistical analysis results of the study’s variables are presented in Table 3. Environmental Performance (EP) has a mean value of 3.16, with a range of values spanning from 2 to 5. The average Return on Assets (ROA) is 0.061, with a minimum value of -0.375 and a maximum value of 0.585.

Table 3. Results of Descriptive Statistical Analysis

Variables	Min	Max	Mean	Std. Dev
EP = Environmental Performance	2.00	5.00	3.15	163.71
ROA = Return on Assets	0.37	0.58	0.06	3.62
DER = Debt-to-Equity Ratio	0.08	17.03	1.00	613.03
SGH = Sales Growth	-0.56	3.39	0.09	34.46
GDV = Gender Diversity	0.00	0.80	0.10	9.36
FZ = Firm Size	13.10	19.01	15.93	816.86

Source: Processed data, 2023

Debt to Equity Ratio (DER) has an average value of 1.01, ranging from a minimum of 0.088 to a maximum of 17.04. Sales Growth (SGR) has an average value of 0.10, ranging from a minimum rating of -0.56 to a maximum rating of 3.39. The average rating for Gender Diversity (GDV) is 0.103, with a minimum rating of 0 and a maximum rating of 0.8. The



average firm size (SZE) is 15.93. Descriptive statistics also provide information about the skewness and kurtosis of the data. The Jarque-Bera test yielded statistically significant results ($p < 0.05$), indicating the presence of distribution anomalies. An in-depth comprehension of the distribution and attributes of these variables serves as a crucial foundation for evaluating the outcomes of regression analysis and making decisions pertaining to environmental management and business financial performance.

Examining corporate EP reveals a symmetrical distribution characterized by a mean of 3.16 with a median of 3.00. This suggests that EP values cluster around the mean uniformly. The symmetrical distribution demonstrates a well-balanced company environmental performance, with minimal volatility, as evidenced by the narrow range of values and low standard deviation. Although many organizations have EPs similar to the industry average, a more thorough analysis necessitates an evaluation of skewness and kurtosis. Additional examination will yield more profound understandings of the peculiarities and features of this EP data, thereby influencing businesses' environmental policies and procedures.

Significant variance in the rate of Return on Assets is shown by the ROA analysis. The discrepancy between the mean (0.061) and the median (0.048) suggests that there are several observations with a ROA value higher than the median. This could cause the mean to be more significantly influenced. The negative minimum value of -0.365, which indicates that specific observations have losses or underperformance, highlights the diversity of ROA. A negative ROA suggests that the profit generated is insufficient to cover the assets' whole value. This could be a sign of financial or operational difficulties in some companies. Additional studies may consider variables like skewness and kurtosis further to comprehend the distribution's structure and asymmetry patterns. Different ROA levels may suggest significant financial difficulties in the industry, necessitating more examination to comprehend the underlying causes and identify organizations that need particular scrutiny.

Significant variance in a firm's level of debt capitalization is shown by analyzing the DER. The discrepancy between the mean of 1.01 and the median of 0.74 suggests some observations with DER values higher than the median. This implies a notable level of diversity in the financial composition of the organizations. The variability of DER is further emphasized by the maximum value of 17.04, which is noteworthy and may suggest the presence of outliers or enterprises with exceptionally high debt levels. These exceptional data points can significantly influence the average, warranting further study attention. To learn more about the DER distribution's form and properties, an analysis of it may include looking at its kurtosis and

skewness. The significant disparity in levels of capitalized debt indicates the intricate financial framework within the industry, and conducting additional studies could facilitate the identification of factors that impact companies' financial choices.

The SGH study clearly indicates the company's financial and organizational stability in terms of growth. Most sampled companies exhibit relatively constant revenue growth, as evidenced by the median of 0.07 and an average of roughly 0.10. This presents a favorable outlook for investors seeking stability and can aid in identifying companies that excel in effectively controlling sales growth. Nevertheless, it is essential to acknowledge that the positive skewness value of 4.09 signifies a distribution inclined toward the right. Consequently, most organizations exhibit sales growth that surpasses the norm, with the possibility of outliers or companies experiencing exceptionally high growth. This presents a favorable opportunity for investors seeking investments that provide substantial potential for growth. SGH analysis offers valuable insights into the sales growth management strategies organizations employ in a corporate setting. The consistent increase in sales can be attributed to the practical approach to adapting to market fluctuations and the long-term viability of the company's activities. Before making an investment decision, investors must consider the industry context and other external elements to have a comprehensive understanding.

Concerning gender diversity (GDV), the variance in the ratio of goodwill to total assets is reflected by a standard deviation of 0.103 & median of 0.069. A substantial amount of goodwill may suggest that a corporation is strongly dedicated to promoting gender diversity. The maximum score of 0.80 is particularly intriguing, which may suggest that some businesses are notably more prevalent in their gender diversity initiatives. Additional examination is necessary to ascertain whether a substantial amount of goodwill is warranted or the consequence of particular business strategies. Examining HR guidelines, educational materials, and other measures that promote gender diversity may be necessary to achieve this. Enterprises possessing elevated GDV values could enjoy a favorable standing regarding sustainability and CSR. Investors must consider how gender diversity policies may affect a company's reputation, financial performance, and social effects when making investments or assessing businesses. Organizations that establish an inclusive atmosphere can gain a competitive edge over time.

With a median of 15.95 and a mean of roughly 15.93, the firm size (FZ) shows a comparatively symmetrical distribution. Although there is little to no skew in the distribution, as indicated by the skewness being close to zero, the high kurtosis indicates the distribution's

heavy tail (2.08). This suggests prominent corporations significantly surpassing the average, resulting in extended tails of a distribution and the possibility of outliers in terms of firm size. Additional examination is required to comprehend the influence of these prominent corporations inside the framework of particular industries or sectors. Large corporations can substantially impact industry analysis, mainly when the company's scale plays a crucial role in shaping the sector's dynamics. The presence of huge enterprises with substantial resources and market power can impact investment or business decisions. To obtain a more comprehensive study, it is crucial to consider external variables and the whole industry while examining the effects of firm size. Large corporations can serve as catalysts for industry growth and innovation in certain instances, but in others, their existence can lead to market imbalances or dominance.

Table 4. Hypothesis Test Results for the Final Model with Random Effects

Hypothesis Proposed	Coefficient	Sig.	Alpha
H ₁ : Return on Assets has a significant positive impact on Environmental Performance	0.9719	0.033	> 0.05
H ₂ : Debt to Equity Ratio has a significant positive impact on Environmental Performance	-0.0628	0.041	> 0.05
H ₃ : Sales Growth has a significant positive impact on Environmental Performance	0.2116	0.040	> 0.05
H ₄ : Gender Diversity has a significant positive impact on Environmental Performance	1.0381	0.005	> 0.05
H ₅ : Firm size positively and significantly moderates the impact of Return on Assets and Environmental Performance	-0.7527	0.0712	< 0.05
H ₆ : Firm size positively and significantly moderates the effect of Debt to Equity Ratio and Environmental Performance	-0.1183	0.0001	> 0.05
H ₇ : Firm size positively and significantly moderates the effect of Sales Growth and Environmental Performance	0.097812	0.1853	< 0.05
H ₈ : Firm size positively and significantly moderates the effect of Gender Diversity and Environmental Performance	0.143102	0.5821	< 0.05

Source: Processed data, 2023

The research findings reveal that Return on Assets (ROA) significantly and positively impacts Environmental Performance (EP), supporting H₁. Additionally, Debt-to-Equity Ratio (DER) also exhibits a significant positive effect on EP (H₂), along with Sales Growth showing a positive and significant influence on EP (H₃). Gender Diversity (GDV) plays a significant and positive role in EP (H₄). However, Firm Size does not significantly moderate the impact of ROA (H₅) and Sales Growth (H₇) on EP, although it does moderate the effects of DER (H₆) and GDV (H₈). These results provide a deep understanding of the intricate relationships among financial factors, gender diversity, company size, and environmental performance in the context of non-financial companies.

Impact of Return on Assets on Environmental Performance



This hypothesis is accepted because the regression coefficient of 0.9719 is significant at the 0.05 level, indicating that Return on Assets (ROA) has a significant positive impact on Environmental Performance (EP). It can be related to legitimacy and stakeholder theory in the context of corporate sustainability. From the perspective of legitimacy theory, the acceptance of H_1 indicates that companies tend to maintain or improve their environmental performance to maintain legitimacy in the eyes of stakeholders. ROA, as an indicator of financial performance, is one of the relevant factors in building legitimacy (T. H. Nguyen et al., 2021). Companies that successfully integrate financial aspects with environmental performance can improve their image and reputation, which are important aspects in legitimacy theory (Hummel, 2016).

From a stakeholder perspective, the acceptance of H_1 reflects the company's positive response to stakeholders' expectations and interests regarding environmental performance. Stakeholders, such as the general public, government, and environmental organizations, have expectations of environmentally responsible business practices (Kuzior et al., 2021). By achieving a positive impact of ROA on EP, companies can better meet stakeholder expectations and needs, which in turn can improve relationships and support from related parties. According to the research by Fujii et al. (2012), the environmental performance of Japanese manufacturing companies has a positive impact on their financial performance. Investing in environmental, social indicators has a positive impact on financial performance (López-Toro et al., 2021). Thus, the acceptance of H_1 not only reflects a statistical correlation, but can also be interpreted as a company's strategic response to pressures and expectations from its environment, in accordance with the principles of legitimacy and stakeholder theory. The findings of this investigation are in line with the legitimacy theory framework, which states that to gain credibility and social acceptance, an organization must implement environmental initiatives to comply with the law and meet stakeholder expectations (Vaktel & Brandsas, 2022).

Investing in environmentally unfriendly ventures will adversely affect the organization's financial results (Küçükbay & Fazlılar, 2016). In line with the opinion of Sun & Liu (2023), employee stock performance is significantly positively related to corporate environmental performance, increasing productivity and environmentally friendly technology. Environmental cost expenditure is positively related to environmental performance and disclosure, thereby strengthening corporate legitimacy (Ifada & Jaffar, 2023).

Impact of Debt to Equity Ratio (DER) on Environmental Performance



This hypothesis is accepted because the regression coefficient of -0.0628 is significant at the 0.05 level, indicating that Debt-to-Equity Ratio (DER) has a significant positive impact on the role of Environmental Performance (EP). Within the agency theory framework, the acceptance of H_2 can be interpreted as evidence that firms with higher DER have a motivation to improve their environmental performance. This can be attributed to the need for firms to maintain good relations with shareholders and reduce financial risk (Jensen & Meckling, 1976). According to Brammer & Pavelin (2006), firms can increase trust and strengthen their credibility in the eyes of shareholders by maintaining good environmental performance.

On the other hand, from the perspective of stakeholder theory, the acceptance of H_2 can be explained by the fact that businesses respond to demands and concerns from various stakeholders, such as the general public, government, and shareholders (Shocker & Sethi, 1973). By recognizing the positive impact of DER on EP, companies can implement measures that support environmentally sustainable business practices, thus meeting stakeholders' expectations and needs. This study supports the conclusions of previous research conducted by Omran & El-Galfy (2014), demonstrating a substantial and dependable correlation between a company's FP and its DER. If the company saves money by making environmental expenditures such as replacing outdated technology, utilizing less energy, or improving efficiencies, environmental challenges may have a beneficial impact on its financial results (Küçükbay & Fazlılar, 2016). Companies that have a substantial amount of debt often depend largely on external funding to fund their assets. Overall, the acceptance of H_2 not only illustrates the statistical correlation between DER and EP, but also illustrates the complex interplay between financial configuration, stakeholder concerns, and organizational efforts to maintain credibility and support.

Impact of Sales Growth on Environmental Performance

This hypothesis is accepted because the regression coefficient of 0.2116 is significant at the 0.05 level, indicating that sales growth has a significant positive impact on the role of Environment Performance (EP). In legitimacy theory, the acceptance of H_3 indicates that companies seek to maintain the support and trust of the general public by highlighting positive environmental performance in line with significant sales growth (Leonidou et al., 2017). This response reflects the company's efforts to meet public demands and expectations regarding sustainability and environmental responsibility (Owen & Kemp, 2013).

From the perspective of stakeholder theory, the acceptance of H_3 reflects the company's efforts to meet the expectations of various parties, including shareholders, consumers, and the

government (Deegan, 2002). Sales growth followed by good environmental performance can increase trust and support from various related parties (Alan et al., 2016). Meanwhile, within the agency theory framework, the acceptance of H₃ suggests that firms adopt a strategy of optimizing environmental performance in line with sales growth to reduce reputational risk and support long-term sustainability. The acceptance of H₃ not only strengthens the relationship between sales growth and environmental performance, but also illustrates how firms effectively use this strategy to satisfy multiple interests, maintain trust, and achieve a balance between business growth and environmental responsibility.

Impact of Gender Diversity on Environment Performance

This hypothesis is accepted because the regression coefficient of 1.0381 is significant at the 0.05 level, indicating that Gender Diversity (GDV) has a significant positive impact on Environment Performance (EP). Acceptance of hypothesis H₄ indicates that gender diversity has a positive and significant impact on environmental performance, with a regression coefficient value of 1.0381 at the 0.05 level of significance. This confirms that the adoption of gender diversity policies in the leadership structure can positively influence the company's efforts in carrying out environmentally friendly business practices. In line with the research conducted by Glass et al. (2015), companies with gender-diverse leadership teams are more effective in pursuing environmentally friendly strategies. Gender diversity, both demographically and structurally, significantly predicts corporate environmental sustainability initiatives (Kassinis et al., 2016). In the study conducted by Ji Li (2016), the results also confirmed that gender diversity in the board of directors has a positive relationship with corporate environmental policies.

From an agency theory perspective, the acceptance of H₄ can be interpreted as the company's efforts to create an inclusive and diverse work environment (Deegan, 2002). By including diverse perspectives in decision-making, companies can be more responsive to the demands and expectations of various stakeholders, including society and regulators (Tingbani et al., 2020). Overall, the acceptance of H₄ indicates that firms that pay attention to gender diversity in their organizational structure can achieve better environmental performance, in line with the increasingly recognized importance of diversity to achieve sustainability and corporate social responsibility goals. Companies that have more women in top management show higher environmental performance and are associated with key indicators such as green products and resource reduction (Burkhardt et al., 2020). The role of board gender diversity enhances

corporate environmental responsibility, especially when female board members hold positions of authority (Y. Wang et al., 2021).

Firm Size Moderates the Return on Assets Impact on Environment Performance

Rejection of hypothesis H₅ shows that firm size does not significantly moderate the impact of Return on Assets (ROA) on Environmental Performance (EEP), with a regression coefficient value of -0.7527 which is not significant at the 0.05 confidence level. This result indicates that company size does not play a significant role in influencing the relationship between financial performance (ROA) and environmental performance. In the context of agency theory, the rejection of H₅ may imply that, regardless of company size, ROA still has a uniform impact on environmental performance. In other words, large and small firms may have comparable levels of response to environmental performance depending on their ROA. In line with the research conducted by Aigbedo (2021), firm size does not moderate the impact of ROA on environmental performance. Several studies with different companies and places also explain that firm size does not significantly affect the moderation of the relationship between ROA and EP (Lie, 2018). The more environmental expenditures a company makes, the less profitability it enjoys, and this negative relationship is moderated by the company's R&D capability represented by R&D intensity (Kim & Kim, 2018). Since reducing environmental costs tends to precede an increase in ROA for at least two years, there are no results as lowering environmental costs is associated with enhanced firm performance, as indicated by Jo et al. (2013). However, it disagrees with García-Gómez et al. (2021), that firm size and leverage play a moderating role in the relationship between economic policy uncertainty and firm performance. Although H₅ is not accepted, this finding provides insight that in the context of environmental performance, the effect of ROA may be independent of firm size. This indicates that other factors may be more dominant in moderating the relationship, and further research is needed to understand these factors.

Firm Size Moderates Debt to Equity Ratio Impact on Environment Performance

This hypothesis is accepted because the regression coefficient of -0.1183 is significant at the 0.05 level, indicating that firm size significantly moderates the impact of DER on environmental performance. Agency theory offers valuable insights into the effect of business size on the correlation between DER and environmental performance (Fama & Jensen, 1983). Firm growth may provide more opportunities and difficulties in managing the management-shareholder relationship. The adoption of H₆ indicates that firm size has a strong moderating effect on the impact of DER on earnings performance. This suggests that depending on firm

size, different capital structures may have different effects on environmental performance. It is important to take into account the importance of corporate sustainability initiatives. This provides an opportunity to formulate financial strategies that are aligned with sustainability goals, so as to improve environmental performance. In line with Odalo et al. (2016), firm size has a positive effect on the financial performance of agricultural companies listed in Kenya, with large companies having a competitive advantage over small companies. Capital market participants assign positive and significantly greater value to the environmental performance ratings of companies that have acknowledged environmental provisions compared to those of companies without such provisions (Baboukardos, 2018). Therefore, the inclusion of H₆ offers a useful understanding of how firm size affects the relationship between capital structure and environmental performance. It is crucial to consider the context of firm size when developing financial and environmental policies.

Firm Size Moderates Sales Growth's Impact on Environment Performance

This hypothesis is not accepted because the regression coefficient of 0.097812 is not significant at the 0.05 level, indicating that firm size does not significantly moderate the impact of sales growth on environmental performance. Rejection H₇, which states that firm size moderates the impact of sales growth on environmental performance, provides a deep understanding of the complexity of the relationship between firm size and the impact of sales growth on environmental performance. This discussion can be enriched by involving the perspective of stakeholder theory, legitimacy theory, and the reasons that support the results found. Zhao et al. (2023) also suggest that turnover negatively moderates the effectiveness of environmental regulations for water pollution. Economic growth targets significantly worsen regional environmental pollution, with environmental regulation negatively adjusting for this effect (Nie et al., 2023). Gang et al. (2023) present conflicting findings, explaining that firm size affects firm performance, moderating the impact of changes in firm labels on shareholder value. Larger firms generally invest more in quality and lean practices, while technology and human resource practices positively improve performance (Szász et al., 2023). Although firm size may provide an indication of the complexity of the organizational structure and the extent of its impact, these results suggest that sales growth does not meaningfully differ in impact on environmental performance between large and small firms (Vilchez et al., 2017). Internal and external stakeholders may have similar expectations of sustainability practices, regardless of firm size (Szász et al., 2023).

From a legitimacy theory perspective, the rejection of H₇ may be explained by the failure of firm size to modify public perceptions and expectations regarding the positive impact of sales growth on environmental performance. Firm size alone may not be a sufficient factor to change or enhance firm legitimacy in the context of sales growth (T. Wang et al., 2017). Therefore, sales growth is considered to have a similar impact on environmental performance, regardless of firm size. According to Dikah et al. (2020), firm size may not be the key factor moderating the impact of sales growth on environmental performance, as other variables such as internal environmental policies, transparency, or commitment of firm leaders may have a more significant role in shaping such outcomes. Thus, the rejection of H₇ provides valuable insights that firm size does not significantly modify the relationship between sales growth and environmental performance. This prompts the thought that to achieve positive outcomes in environmental performance, firms need to consider other variables beyond firm size, such as environmental policy, transparency, and stakeholder engagement.

Firm Size Moderates Gender Diversity Impact on Environment Performance

This hypothesis is not accepted because the regression coefficient of 0.143102 is not significant at the 0.05 level, indicating that firm size does not significantly moderate the impact of gender diversity (GDV) on environmental performance (EP). The fact that H₈, which states that firm size reduces the effect of GDV on EP, is rejected, provides important information about the small role played by firm size in the relationship between environmental performance and gender diversity. In line with the research of Savio et al. (2023), firm size does not significantly moderate environmental performance.

The views of agency theory, human resource theory, and the sustainable application of gender in the business environment can be used (Jensen & Meckling, 1976). By concentrating on the relationship between gender diversity on environmental performance, which is less influenced by firm size, agency theory can explain why H₈ is rejected. Firm size may not be a significant determinant in altering or enhancing the efficacy of gender diversity in achieving environmental performance. Other elements, such as organizational culture, human resource-related policies, and the commitment of company leaders, may have a greater influence (Park & Doo, 2020). Gender sustainability is relevant and should be taken into account. While company size may impact various elements of operations, these findings suggest that the sustainability of gender diversity and environmental sustainability in relation to gender may be more influenced by factors such as organizational commitment and human resource policies (Roscoe et al., 2019). Therefore, it is crucial for companies to consider gender sustainability

plans that prioritize organizational values and culture, regardless of company size (Valduga et al., 2023). Therefore, the rejection of H₈ provides valuable insights that firm size does not significantly alter the correlation between gender diversity and environmental performance. In contrast to the findings of (Joecks et al., 2013; T. H. H. Nguyen et al., 2021), the internal governance mechanisms studied have mixed moderating effects on the relationship between financial performance and environmental performance. Important implications for corporate executives, environmental activists, policy makers, and regulators (Ma et al., 2019). Additional elements such as organizational culture, human resource policies, and corporate leadership commitment may play a more important role in delivering favorable outcomes in gender environmental sustainability and environmental performance.

CONCLUSION

The results show that Return on Assets (ROA), Debt-to-Equity Ratio (DER), Sales Growth (SGH), and Gender Diversity (GDV) have a significant impact on Environment Performance (EP). However, Firm Size (FZ) only moderates the impact of DER on EP. Meanwhile, FZ does not significantly moderate the impact of ROA, SGH, and GDV on EP. These results provide insights into the factors that contribute to firm financial performance and how firm size plays a moderating role. This study has several implications for research and practice. First, the significant impact of ROA, DER, SGH, and GDV on EP suggests that firms should focus on improving these factors to enhance their environmental performance. Second, the moderating role of FZ on the relationship between DER and EP highlights the importance of considering firm size when analyzing the impact of financial factors on environmental performance.

However, this study has some limitations. The sample size may be relatively small, limiting the generalizability of the findings. Additionally, the study only considers a limited set of financial and non-financial factors that may influence EP. Future research could expand the scope of analysis to include other factors, such as corporate governance practices or industry characteristics, to provide a more comprehensive understanding of the determinants of environmental performance.

For future research, it would be valuable to explore the impact of other financial and non-financial factors on EP and to examine how these factors interact with firm size. Additionally, longitudinal studies could provide insights into the dynamics of the relationship between financial performance, firm size, and environmental performance over time.

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