

# Board Gender Diversity as a Moderator: ESG, Sustainability Reporting, and Green Innovation on Firm Value

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## ABSTRACT

This study examines and analyzes the influence of environmental, social and governance, sustainability reporting and green innovation on firm value with board gender diversity as moderation. This study uses a quantitative approach and secondary data. The population in this study are energy sector companies listed on the Indonesia Stock Exchange (IDX). The results of the study show that the independent variables, namely environmental, social and governance, sustainability reporting and green innovation with the moderating variable, namely board gender diversity, together have an influence on firm value. While partially environmental, social and governance has a positive effect on company value, sustainability reporting has a negative effect on company value, green innovation has no effect on firm value. Board gender diversity can moderate the influence of Environmental, Social and Governance and sustainability reporting on firm value. However, board gender diversity does not moderate the influence of green innovation on firm value. This study adds a moderating variable of board gender diversity, which is considered to have a combined influence on the relationship between Environmental, Social and Governance, sustainability reporting and green innovation on firm value which aims to answer the inconsistency of previous research findings.

**Keywords:** Board Diversity Gender, Environmental, Social and Governance, Firm Value, Green Innovation, Sustainability Reporting

**JEL Classifications:** G0, G3, M4, Q56

## 1. INTRODUCTION

In recent years, research addressing corporate objectives to increase firm value has evolved considerably. Drastic changes in the global risk profile have a significant impact on the global business and economic environment. According to Aras and Hacioglu Kazak (2022), in their research stated that the pandemic crisis, climate crisis, social justice crisis, and global economic crisis (market globalization and trade liberalization) are problems currently faced by various organizations. In addition, the components of market value for approximately half a century have undergone a transition seen from the growth of intangible assets in the form of corporate trust, corporate reputation, business strategy, risk management strategy, human resources, operational legitimacy, and supply chain. In addition, many studies now reveal that shareholders

may be oriented toward environmental, social, and governance issues in addition to profit maximization. These shareholders expect companies to consistently implement policies that promote environmental, social, and governance concerns (Dihardjo and Hersugondo, 2023). Therefore, in measuring the high or low value of the company, this research uses several approaches, namely Environmental, Social, and Governance; Sustainability Reporting; and Green Innovation as objects that will affect the value of a company.

In analyzing the relationship between non-financial and financial aspects of the company, it is important to evaluate some company characteristics that can moderate this relationship, because it is very important in interpreting the findings obtained from data analysis (Dihardjo and Hersugondo, 2023). For this reason, this

study uses board gender diversity as a moderator, which means that women are actively involved and represented in the composition of the board in the company. Gender diversity is considered to strengthen the transparency of sustainability disclosure practices and how green innovation is implemented in Indonesia so that it can improve information asymmetry between companies and investors, which can help companies create a good reputation and significantly increase company value. From a practical point of view, research results from (Li et al., 2022) show that board representation increases the positive effect of CSR initiatives on firm value.

The value of a company is often seen from the value of a company's shares, the success of a company is proportional to the increase in stock prices, and the value of a company is proportional to the value of shares sold in the capital market. Stock prices can be influenced by projections of company performance, management policy-making, and good or bad company fundamentals as internal factors (Oktaviani et al., 2023). The following is a table of company value measurements from several energy sector companies on the Indonesia Stock Exchange.

No	Code	Firm value table				
		Sector energy period 2018-2022				
		2018	2019	2020	2021	2022
1	ABMM	1.18	1.03	0.97	0.90	0.98
2	AKRA	1.27	1.21	1.09	1.22	1.55
3	BUMI	2.11	1.74	1.05	0.92	1.22
4	ELSA	0.86	0.80	0.85	0.76	0.79
5	INDY	0.84	1.04	0.92	0.90	0.88
6	ITMG	1.48	0.98	1.13	1.16	1.33
7	MBSS	0.51	0.46	0.47	0.74	0.75
8	PGAS	1.01	1.02	0.95	0.84	0.90
9	PSSI	0.80	0.81	0.75	1.13	1.32
10	PTBA	2.20	1.43	1.64	1.19	1.30
11	PTRO	0.86	0.80	0.80	0.77	0.97
					+/-	3.48

Source: Data Processed by the Author, 2024

The most significant decrease in company value in BUMI shares occurred in 2020, this is due to the increase in the level of liabilities from the previous year, which amounted to IDR 51.5T in 2020, this value is much higher than the value of liabilities in 2019 of IDR 49.9T. This condition explains that the more the company has debt that exceeds the optimal limit, the lower the company's value. Inefficient use of debt can cause a decrease in the value of the company, when the company's debt results in a decrease in value, there is a low assessment of the company by the public and investors (Rezeki et al., 2023). Furthermore, the decline in company value at Bukit Asam Tbk (PTBA) occurred in 2019 and 2021. This is due to the rapid increase in total assets, namely IDR 26.1T in 2019 compared to 2018 IDR 24.2T and in 2021 IDR 34.1T which is higher than 2020 IDR 24.1T. High growth in company assets can lead to an increasing need for funds to manage the company's operational activities because companies tend to choose to retain company profits for company growth compared to the welfare of investors or shareholders. This causes investors not to trust the company and will adversely affect the value of the company so that it experiences a decrease in the value of the company (Triyani et al., 2018).

In addition, investor sentiment also affects market volatility, liquidity, and overall investment performance. Positive sentiment can create strong market trends and provide an additional boost to assets, while negative sentiment can lead to massive selling. To achieve the company's goal of maximizing company value, the company needs to maintain good relations with the surrounding community by reducing the negative impact of the company's operational activities (Machmuddah et al., 2020). Therefore, one of the factors that can affect firm value is the disclosure of environmental, social, and governance (ESG), Sustainability Reporting, and Green Innovation.

The increasing interest in ESG research among academics and experts has led to an examination of the effectiveness of ESG on firm value (Chang and Lee, 2022). In research conducted by (Dihardjo and Hersugondo, 2023) explained a meta-analysis conducted by (Whelan et al., 2021) of 1,000 studies exploring the impact of ESG on firm value showed 58% of studies showed a significant positive impact, 8% showed a significant negative impact, 13% showed no significant impact and 21% showed mixed results. Thus, the impact of ESG disclosure on increasing firm value is still uncertain. For this reason, the purpose of this research is to provide results that are expected to contribute to the existing literature and expand the research results to a certain extent.

If in previous studies conducted by (Melinda and Wardhani, 2020; Chouaibi et al., 2022; Kartikasary et al., 2023) ESG is measured using data obtained from Thomson Reuters and research conducted by (Wong et al., 2021; Mutiah and Rusmanto, 2023; Priyanto and Suhandi, 2023) ESG is measured using data from Bloomberg, this study is different from previous studies where ESG is measured using indicator proxies published by Morgan Stanley Capital International (MSCI). According to Chouaibi et al (2022) the most prominent ESG dataset used in the accounting literature is MSCI ESG STATS (KLD). In addition, MSCI has scores that measure how well a company manages its performance and how relevant the issue is to a particular company. None of the other ratings have indicators that explicitly measure this (Berg et al., 2022). In addition, the author analyzed 27 papers to compare ESG measurements, the data is shown in the table below.

From the Table 1, it can be seen that the measurement of ESG with MSCI has not been widely carried out, so it is still very interesting to conduct research again using MSCI proxies in measuring ESG variables. Kim and Li (2021a) in their research used MSCI KLD

**Table 1: Summary ESG variable measurement**

Type of measurement	Year				Total
	2020	2021	2022	2023	
Bloomberg's ESG database	2	1	1	3	7
Thomson reuters ESG/Refinitiv	1	0	3	7	11
Eikon					
GRI Indicators	0	1	2	2	5
ESG index data from the ASEAN-4 countries and China	0	0	2	0	2
Sino-securities ESG rating	0	0	1	0	1
MSCI ESG KLD	0	1	0	0	1
	3	3	9	12	27

Source: Data Processed by the Author, 2024

in measuring ESG practices which included 172,437 observations from 1991 to 2013 based on 4708 companies in all industries. Meanwhile, this study uses MSCI indicators to test the influence of ESG in developing countries, especially Indonesia, using data obtained from the Indonesia Stock Exchange.

The second factor that is thought to affect firm value is sustainability reporting (SR), if it is associated with current market conditions, social responsibility and corporate governance are very important in creating firm value. The demand for social responsibility from society to the company makes the company adopt the 3P concept developed by Elkington (1998), namely People, Planet and Profit. It is also called the Triple Bottom Line, which means that the company's performance can be measured from the profits earned, its contribution to environmental sustainability, and the welfare of society. Another term recognized by various companies globally is sustainability (Sejati and Prastiwi, 2015). Finally, the factor that is thought to affect firm value is green innovation. Green Innovation is a tool for determining long-term sustainability, enabling companies to increase their sources of productivity, improve financial performance, profitability, and competitive advantage, and help companies overcome internal and external pressures from government and society, and also related to compliance with standards issued by the government or authorized agencies (Husnaini and Tjahjadi, 2021). Green innovation has developed vertically and horizontally in every dimension, from the micro enterprise level to the national macro level, which has an important impact on the development of green enterprises in various countries around the world. However, market competition is fierce, and emitting green innovation alone cannot meet the needs of various stakeholders. More and more companies realize the importance of social responsibility and green innovation is beneficial to the sustainable development of companies in the future (Zhang et al., 2020).

## 2. LITERATURE REVIEW

Stakeholder Theory was first proposed by Professor R. E. Freeman, in his book entitled "Strategic Management: A Stakeholder Approach". Freeman (1984) built this theory in the context of business organization management and defined the form of "stakeholders of an organization are any group or individual who can affect or be affected by the achievement of the organization's objectives." Stakeholder theory emphasizes the importance of management that takes into account the interests of all stakeholders. Previous research found that environmental performance improves corporate image, increases revenue, and reduces and shows positive abnormal stock returns from environmental disclosure practices (Melinda and Wardhani, 2020). In stakeholder theory, stakeholders need to know all information, including information about hazardous waste, water pollution, social assistance, and even information that is not directly relevant to them, so they need data information from sustainability reports.

Legitimacy theory was first proposed by Dowling and Pfeffer (1975). Legitimacy is a generalized perception or assumption that the actions of an entity are desirable, reasonable, or appropriate in the context of a system consisting of certain socially constructed

norms, values, beliefs, and definitions (Manullang, 2017). Legitimate entities are those that are in line with rationality (science), and law (or law-like rules) and have objectives that are in line with societal values (Manullang, 2017). Legitimacy risk arises from potential conflicts between companies and local communities, especially when a company's business operations have consequences that harm the environment or local communities. The public interest is an interest that must also be considered by the regulator, so a similar situation may arise between the company and the regulator (Yudhanto and Simamora, 2023). Legitimacy theory affects firm value through several approaches, including corporate reputation and image, support from stakeholders, trust and relationships with stakeholders, and institutional support.

Upper Echelon Theory, first proposed by Hambrick and Mason in 1984, states that managerial background characteristics are determinants of an organization's choices and affect its level of performance. Hambrick (2007) also argues that the experience, values, and personality of executives have a significant influence on their decision-making. This UET supports many attributes of gender diversity where women are associated with environmental innovation (He and Jiang, 2019). The theory emphasizes that women have a greater concern for shareholder welfare and they are more responsive in taking action to prevent environmental risks that could harm society (Adams et al., 2011; Liu, 2018). Women may also have stronger environmental preferences than men (McCright, 2010).

In line with legitimacy theory where the value of the company can be represented through several approaches, including reputation and corporate image, support from stakeholders, trust and relationships with stakeholders, and institutional support. By disclosing environmental performance, the company will gain trust and support from the wider community. Concern for social issues will make the company accepted by society. Finally, governance disclosures reflect how the company operates about management, CSR strategies, and shareholders. The corporate governance pillar shows the rights and responsibilities of management or the corporate governance structure (Kim et al., 2018).

Previous research found that environmental performance improves corporate image, increases revenue, and reduces and shows positive abnormal stock returns from environmental disclosure practices (Melinda and Wardhani, 2020). Environmental, social, and governance disclosures have a positive effect on firm value (Ferrell et al., 2016; Yu et al., 2018). The results of research conducted by (Fuadah et al., 2022) found that environmental, social, and governance disclosures have a significant positive effect on firm value. ESG disclosure can increase firm value through increased transparency, accountability, and stakeholder trust (Li et al., 2018). This means that the greater the environmental, social, and governance (ESG) disclosure, the higher the firm value. So it can be concluded that ESG disclosure can bring reputation and credibility to the company so that it can increase company value.

$H_1$ : Environmental, social, and governance has a positive effect on firm value

In stakeholder theory, stakeholders need to know all information, including information about hazardous waste, water pollution, social assistance, and even information that is not directly relevant to them, so they need data information from sustainability reports. In a study conducted by Link et al. (2022) the results of the study have revealed a positive relationship between sustainability reports and firm value when measuring sustainability reports with aggregate indicators and components such as general indicators, economic dimensions, and environmental and social dimensions. Investors who are concerned about the long-term benefits of corporate management will see sustainability reports as a logical application of stakeholder performance and as a result of good corporate governance (Hörisch et al., 2006). Thus these investors will believe that publishing a sustainability report can positively affect the value of the company itself.

$H_2$ : Sustainability reporting has a positive effect on firm value

In line with legitimacy theory, companies can produce goods and provide services that should have minimal environmental impact. For companies, it is important to produce environmentally friendly products and provide clear information about the impact of the products produced on the environment, so that in this case the company can build legitimacy with consumer confidence in their products. A study conducted by Dai and Xue, (2022), concluded that green innovation has a positive effect on firm value. Green innovation can increase the value of companies in the growth stage by increasing their sustainable development capabilities and reducing debt financing costs. However, for companies in the decline stage of their life cycle, green innovation can only increase firm value by reducing debt financing costs.

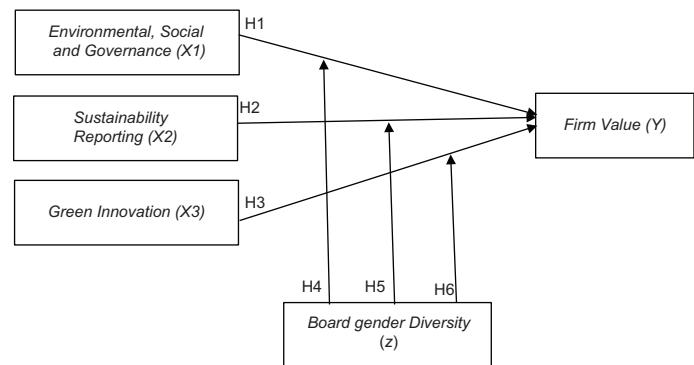
$H_3$ : Green innovation has a positive effect on firm value

$H_4$ : Board gender diversity moderates the effect of environmental, social, and governance on firm value

$H_5$ : Board gender diversity moderates the effect of sustainability reporting on firm value

$H_6$ : Board gender diversity moderates the effect of green innovation on firm value

Based on the hypothesis above, the conceptual framework of this study is formulated as follows:



### 3. RESEARCH METHOD

The approach used in this research is quantitative. This research process is deductive, where concepts or theories are used to answer research questions, thus allowing for the formulation of hypotheses. In this study, there are three types of variables to be measured, the dependent variable, namely firm value; independent variables, namely environmental, social and governance, sustainability reporting and green innovation; and moderating variables, namely board gender diversity. The population used in this study are energy sector companies listed on the Indonesia Stock Exchange for the 2019-2023 period. The sample of this study was determined using a non-probability sampling method with a purposive sampling technique. To process the secondary data obtained, researchers used Eviews software version 12.0, by conducting tests such as Descriptive Statistical Analysis, Panel Data Regression Analysis, Coefficient Determination, Moderated Regression Analysis, and Hypothesis Testing.

Research variable	Definition	Measurement	Scale
Firm value (Y)	Company value is the realized value of assets when the company is sold or the value of the stock price (Agustia et al., 2019)	Tobin's Q $\frac{(VMS - D)}{TA}$	Ratio
Environmental, Social and Governance (X1)	ESG is the consideration of environmental, social, and governance factors, as well as financial factors in the investment decision-making process (MSCI, 2020).	Source: Fuadah et al. (2022) ESG=Total Items disclosed/total disclosure items (37)	Ratio
Sustainability Reporting (X2)	Sustainability report is a report that contains non-financial information from the company's social and environmental activities that enable the company to grow sustainably (Hidayat, et al., 2024).	Source: Morgan Stanley Capital International (MSCI) SR=Total Items disclosed/total disclosure items (139)	Ratio
Green Innovation (X3)	Green innovation refers to innovations carried out by companies to create competitive advantages while reducing environmental damage, thereby generating economic benefits (Agustia et al., 2019)	Source: Global Reporting Initiative (GRI) Standards (2017) GI=Total Items disclosed/total disclosure items (4)	Ratio
Board Gender Diversity (Z)	Diversity related to the board of directors namely female representation as indicated by the percentage of women on the board or executive committee (Mahsina and Agustia, 2023).	Source: Septianingsih and Muslih (2019)	Ratio

## 4. RESULTS AND DISCUSSION

Based on the results of the descriptive statistical analysis in Table 2, it can be observed that the data used consists of 100 observations. The maximum value indicates the largest value range in the study. The minimum value indicates the smallest value range in the study. The mean value represents the average range, and the standard deviation shows the variability of the data in the study.

### 4.1. Panel Data Regression

In the analysis using panel data regression, there are three approaches, namely common effect, fixed effect and random effect (Table 3).

### 4.1. Regression Analysis and Hypothesis Test

Regression data analysis in this study uses Hierarchy Regression Analysis through the use of Multiple Regression Analysis and Moderated Regression Analysis (MRA). The following are the results of the regression analysis in this study (Table 4).

Based on the test results in Table 4, it can be explained that board gender diversity is a moderator predictor, namely a moderating variable that only acts as a predictor variable (independent). In the relationship model formed, it is not a moderator but a predictor variable (independent), namely a variable that cannot moderate environmental, social, and governance sustainability reporting on firm value even though environmental, social, and governance and sustainability reporting affect firm value. In addition, board gender diversity is a homologizer moderator (potential moderation), namely the variable has the potential to become a moderating variable, which does not moderate between Green Innovation and Firm Value.

Referring to the partial test results of the effect of environmental, social, and governance on firm value, it is known that the t-count value on the environmental, social, and governance (X1) variable is 4.327067 (Table 5). Thus, the t-count value > t-table (4.327067 > 1.98525) while the probability value is 0.0000 < 0.05, which means that environmental, social, and governance have a significant positive effect on firm value. This explains that ESG reporting has a positive effect on firm value. ESG disclosure informs stakeholders about ESG actions which are very important for improving reputation, risk reduction, increasing transparency, and management orientation in expanding company value and

attracting investors to make socially responsible investments. The results of this study corroborate previous studies which state that companies that disclose ESG can increase firm value because ESG disclosure helps regulators to monitor ESG activities and helps investors in making investment decisions (Kartikasary et al., 2023). The results of this study are in line with research conducted by (Dwimayanti et al., 2023) and (Kartikasary et al., 2023) which state that environmental, social, and governance have a positive effect on firm value.

Referring to the partial test results of the effect of sustainability reporting on firm value, it is known that the t-count value on the sustainability reporting variable (X2) is -1.989230. Thus, the t-count value < t-table (-1.989230 < 1.98525) while the probability value is 0.0495 < 0.05, this means that sustainability reporting has a significant negative effect on firm value. This explains that the effect of sustainability reporting on firm value is significantly negative because sustainability reports in Indonesia are relatively rarely disclosed because they are voluntary. This condition shows that weak corporate governance and lack of sustainability reporting reduce company value (Yondrichs et al., 2021). In addition, according to Javeed and Lefen, 2019, sustainability reporting reduces the value of the company, investors argue that sustainability reporting only increases costs if the company's goal is for charity, or supports social development programs, thereby reducing profitability, which ultimately reduces the value of the company. The results of this study are in line with research conducted by (Yondrichs et al., 2021) and (Husnaint and Basuki, 2020) which state that Sustainability Reporting has a significant negative effect on firm value.

Referring to the partial test results of the effect of green innovation on firm value, it is known that the t-count value on the Green Innovation variable (X3) is -0.629535. Thus the t-count value < t-table (-0.629535 < 1.98525) while the probability value is 0.5305 > 0.05, this means that green innovation does not affect company value. The above results explain that the effect of green innovation on firm value is declared to have no effect because the company in implementing green innovation is only as compliance with laws and regulations not for the main driver of investor assessment and implementing green innovation is not an easy task, it will cost a lot to realize it (Endah et al., 2023). Implementing it requires innovative stages of work. At this stage, it contributes extreme capital, assets, and time to get the best results. It takes great administration to design, organize, and supervise to create progress and sustainability in the company's business (Maulana and Mulyadi, 2022). The results of this study are in line with research conducted by (Endah et al., 2023) and (Maulana and Mulyadi, 2022) which state that Green Innovation has no significant effect on firm value.

The board gender diversity variable is a moderator predictor, namely a moderating variable that only acts as a predictor variable (independent) indicated by the results of the t-statistic value of environmental, social, and governance on firm value of 3.166487 with a prob value. 0.0021 and board gender diversity moderates environmental, social, and governance on firm value has a t-statistic value of -1.656677 with a prob value. 0.1010. Thus, the t-statistic

**Table 2: Descriptive statistics**

	NP	ESG	SR	GI	BGD
Mean	1.066702	0.527297	0.552590	0.547500	0.152144
Median	0.942090	0.513514	0.503597	0.500000	0.142857
Maximum	3.101019	0.891892	0.978417	1.000000	0.333333
Minimum	0.296472	0.162162	0.158273	0.250000	0.043478
Std. dev.	0.538079	0.160860	0.231896	0.206262	0.076107
Skewness s	1.742388	0.115562	0.336634	0.070530	0.872370
Kurtos is	6.159207	2.506721	1.833284	2.230752	3.226243
Jarque-Bera	92.18439	1.236427	7.560476	2.548502	12.89710
Probability	0.000000	0.538906	0.022817	0.279640	0.001583
Sum	106.6702	52.72973	55.25899	54.75000	15.21443
Sum sq. dev.	28.66341	2.561717	5.323813	4.211875	0.573434
Observations	100	100	100	100	100

**Table 3: Common effect model**

Variable	Coefficient	Std. error	t-statistic	Prob.
C	0.503399	0.203576	2.472783	0.0152
ESG	1.937832	0.637181	3.041257	0.0030
SR	-0.755547	0.445997	-1.694062	0.0935
GI	-0.074892	0.272276	-0.275058	0.7839
<b>Fixed effect model</b>				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	0.014871	0.244845	0.060735	0.9517
ESG	3.336172	0.789927	4.223395	0.0001
SR	-1.144113	0.645127	-1.773471	0.0801
GI	-0.137165	0.261279	-0.524976	0.6011
<b>Random effect model</b>				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	0.174014	0.233812	0.744249	0.4585
ESG	2.960187	0.684109	4.327067	0.0000
SR	-1.057002	0.531362	-1.989230	0.0495
GI	-0.153648	0.244066	-0.629535	0.5305
<b>Selection of panel data estimation model technique</b>				
<b>Chow test</b>				
Effects test	Statistic	d.f.		Prob.
Cross-section F	7.644974	(19.77)		0.0000
Cross-section Chi-square	106.001776	19		0.0000
<b>Hausman test</b>				
Test summary	Chi-sq. statistic	Chi-Sq. d.f.		Prob.
Cross-section random	2.939042	3		0.4011
<b>Lagrange multiplier test</b>				
<b>Cross-section</b>	<b>Test hypothesis time</b>	<b>Both</b>		
Breusch-Pagan (0.0000)		56.09688	0.965370 (0.3258)	57.06225 (0.0000)

**Table 4: Regression analysis**

Independent variable	Prob	Moderation variable	Prob	Independent * Moderation	Prob	Description
(ESG→NP)	3.166487/0.0021	(BGD→NP)	0.085575/0.9320	(ESG*BGD)	-1.656677/0.1010	Predictor Moderator
(SR→NP)	-2.625522/0.0101			(SR*BGD)	2.035877/0.0446	Predictor Moderator
(GI→NP)	-0.249975/0.8032			(GI*BGD)	0.088787/0.9294	Homologizer Moderator

Source: Data processed

**Table 5: Hypothesis**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.174014	0.233812	0.744249	0.4585
ESG	2.960187	0.684109	4.327067	0.0000
SR	-1.057002	0.531362	-1.989230	0.0495
GI	-0.153648	0.244066	-0.629535	0.5305

Source: Data Processed

( $ESG \geq NP$ ) of 3.166487 > t-table 1.98525 and prob value. 0.0021 < 0.05 and t-statistic ( $ESG * BGD \Rightarrow NP$ ) of -1.656677 < t-table 1.98525 with prob. 0.1010 > 0.05. So it can be concluded that the environmental, social, and governance variable is significant and board gender diversity is not significant. Thus,  $H_4$  in this study is rejected, so that BGD only acts as a predictor variable for the influence of environmental, social, and governance on firm value. This is explained through the upper-echelon theory that gender diversity on the board not only improves the company's ESG practices but also mitigates related managerial opportunistic behavior. However, firms that have more female directors on the board are less likely to

engage in ESG practices (Eliwa et al., 2023). While gender diversity is considered a factor that can enrich perspectives in decision-making, effective integration of this diversity with a company's ESG strategy often requires a change in organizational culture and commitment from the entire board and senior management. If gender diversity is not well integrated into the company's decision structure, it can reduce the effectiveness of managing ESG aspects. The results of this study are in line with research conducted by (Eliwa et al., 2023 and Marquez-Cardenas et al., 2022).

The board gender diversity variable is a moderator predictor, which is a moderating variable that only acts as a predictor variable (independent) indicated by the results of the t-statistic value of sustainability reporting on firm value of -2.625522 with a prob value. 0.0101 and board gender diversity moderates sustainability reporting on firm value has a t-statistic value of 2.035877 with a prob value. 0.0446. Thus, the t-statistic ( $SR \Rightarrow NP$ ) of -2.625522 < t-table 1.98525 and prob value. 0.0101 < 0.05 and t-statistic ( $SR * BGD \Rightarrow NP$ ) of 2.035877 > t-table 1.98525 with prob. 0.0446 < 0.05.

So it can be concluded that the sustainability reporting variable is significant and board gender diversity is significant. Thus,  $H_4$  in this study is accepted, so that BGD moderates by strengthening the effect of sustainability reporting on firm value, and BGD acts as a predictor variable for the effect of sustainability reporting on firm value. This is explained by the presence of female board members appreciated by the market as an internal mechanism that strengthens the monitoring function and forms a more independent board. Increased participation of women on the board in strategic decision-making leads to an increase in the quality of board decisions. This is related to their assignment to key positions such as audit committee, nomination and remuneration committee, governance, and CSR (Dewi et al., 2023). The presence of BGDs can strengthen a company's commitment to SR by ensuring that business strategies not only optimize financial returns but also consider its impact on society and the environment. More specifically, research shows that companies with more gender-diverse boards tend to have more socially responsible corporate practices, which can improve corporate image and long-term value through better market acceptance and more positive relationships with stakeholders. This research is in line with research conducted by (Dewi et al., 2023).

The board gender diversity variable is a homologizer moderator (potential moderation), namely that the variable has the potential to become a moderating variable indicated by the results of the t-statistic value of green innovation on firm value of  $-0.249975$  with a prob value.  $0.8032$  and board gender diversity moderates green innovation on firm value has a t-statistic value of  $0.088787$  with a prob value.  $0.9294$ . Thus, the t-statistic (GI  $\Rightarrow$  NP) of  $-0.249975 < t\text{-table } 1.98525$  and prob value.  $0.8032 > 0.05$  and t-statistic (GI \* BGD  $\Rightarrow$  NP) of  $0.088787 < t\text{-table } 1.98525$  with prob.  $0.9294 > 0.05$ . So it can be concluded that the green innovation variable is not significant and board gender diversity is not significant. Thus,  $H_6$  in this study is rejected, so that board gender diversity has the potential to become a moderating variable and cannot strengthen or weaken the effect of green innovation on firm value. This is because gender diversity negatively impacts green process innovation in countries with low gender parity where, based on descriptive statistics, women's representation is only 13%, which is below the UN recommendation of 30%. Indonesia is a country with low gender parity; therefore, it is important to increase women's involvement in the boardroom so that they positively impact the company by implementing green policies (Mahsina and Agustia, 2023). Green innovations often involve large investments in research and development and implementation of new infrastructure. The decision to adopt green innovations depends not only on the board of directors, but also on corporate resources, government policies, and market pressures that may not be fully influenced by BGD. Although BGD is important for inclusiveness and representation, its impact on the direct effect of Green Innovation on firm value may be limited and more dependent on other factors that affect the company's innovation strategy. This research is in line with research conducted by (Mahsina and Agustia, 2023).

## 5. CONCLUSION

Based on the results of the analysis and discussion that has been described, this study concludes that the results of testing the

environmental, social, and governance variables have a significant positive effect on firm value. Thus,  $H_1$  in this study is accepted. The results of testing the sustainability reporting variable on firm value have a significant negative effect. Thus,  $H_2$  in this study is accepted. The results of testing the green innovation variable on firm value have no effect. Thus,  $H_3$  in this study is rejected. So it can be concluded that the environmental, social, and governance variable is significant and board gender diversity is not significant. Thus,  $H_4$  in this study is rejected, so that BGD only acts as a predictor variable for the influence of environmental, social, and governance on firm value. Then it can be concluded that the Sustainability Reporting variable is significant and board gender diversity is significant. Thus,  $H_5$  in this study is accepted, so that BGD moderates by strengthening the effect of sustainability reporting on firm value, and BGD acts as a predictor variable for the effect of sustainability reporting on firm value. So it can be concluded that the green innovation variable is not significant and board gender diversity is not significant. Thus,  $H_6$  in this study is rejected, so that board gender diversity has the potential to become a moderating variable and cannot strengthen or weaken the effect of green innovation on firm value.

This research was conducted with the utmost effort by the researcher; however, due to limited resources, it has some shortcomings. First, the research was only conducted for 5 years of research. First, the Adjusted R-square (R2) value is  $0.224813$  or  $22.48\%$  which means that  $77.52\%$  is influenced by other variables not included in this study. Second, this study only uses 3 independent variables, namely environmental, social and governance, sustainability reporting, and green innovation, moderating variable board gender diversity. The results are only environmental, social, and governance variables that have a significant effect, while the sustainability reporting variable has a negative effect and the green innovation variable has no effect, so it cannot be used as a direct reference for consideration in seeing the company's value. Third, there are still some companies that do not have the complete data needed so the sample used is limited and reduces the number of samples. Finally, a lack of supporting literature that can be obtained regarding the board gender diversity variable in moderating the influence of environmental, social and governance, sustainability reporting, and green innovation on firm value.

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