



## **BOARD GENDER DIVERSITY AS A MODERATOR IN THE EFFECT OF ESG PERFORMANCE ON SYSTEMATIC RISK**

**Fivi Anggraini<sup>1(\*)</sup>, Ferli Meidiana Cahyati<sup>2</sup>, Dwi Fitri Puspa<sup>3</sup>,  
Meihendri<sup>4</sup>, Aza Azlina Md Kassim<sup>5</sup>**

<sup>1,2,3,4</sup>Faculty of Economics and Business, Universitas Bung Hatta, Ulak Karang Utara, Kec. Padang Utara, Kota Padang, Sumatera Barat, Indonesia

<sup>5</sup>Graduate School of Management, Management & Science University, Persiaran Olahraga, Section 13, Shah Alam, Selangor, Malaysia

**Correspondence Author<sup>(\*)</sup>:** [fivianggraini@bunghatta.co.id](mailto:fivianggraini@bunghatta.co.id)

### **Abstract**

*The gender diversity of the board is essential to reduce the systematic risk of manufacturing companies. To mitigate this risk, manufacturing companies in Indonesia need to pay attention to and strengthen environmental, social, and governance (ESG) performance. This study aims to empirically examine the influence of environmental, social, and governance (ESG) performance on systematic risk with gender diversity of the board as moderation in manufacturing companies in Indonesia. The sampling technique used is purposive sampling. The number of samples in this study is 16 manufacturing companies listed on the Indonesia Stock Exchange (IDX) during 2019-2023. Data analysis was carried out using the SPSS and Gretl programs. The empirical results of this study provide evidence of the negative influence of environmental and governance performance on systematic risk. However, social performance does not have systematic risk. This study succeeded in proving that the gender diversity of the council moderates the relationship between environmental performance, social performance, and governance performance to systematic risk. This research can be a foundation for companies to strengthen and improve the environmental, social, governance (ESG), and gender diversity performance of the board to reduce systematic risks and meet stakeholders' expectations.*

**Keywords:** Environmental; Gender diversity; Social and governance (ESG); Systematic risk.

### **Abstrak**

Keberagaman gender pada dewan direksi sangat penting untuk mengurangi risiko sistematis pada perusahaan manufaktur. Untuk memitigasi risiko tersebut, perusahaan manufaktur di Indonesia perlu memperhatikan dan memperkuat kinerja lingkungan, sosial, dan tata kelola (ESG). Penelitian ini bertujuan untuk menguji secara empiris pengaruh kinerja lingkungan, sosial, dan tata kelola (ESG) terhadap risiko sistematis dengan keberagaman gender pada dewan direksi sebagai moderasi pada perusahaan manufaktur di Indonesia. Teknik pengambilan sampel yang digunakan adalah purposive sampling. Jumlah sampel dalam penelitian ini sebanyak 16 perusahaan manufaktur yang terdaftar di Bursa Efek Indonesia (BEI) selama tahun 2019-2023. Analisis data dilakukan dengan menggunakan program SPSS dan Gretl. Hasil empiris penelitian ini memberikan bukti adanya pengaruh negatif kinerja lingkungan dan tata kelola terhadap risiko sistematis. Namun, kinerja sosial tidak memiliki risiko sistematis. Penelitian ini berhasil membuktikan bahwa keberagaman gender pada dewan direksi memoderasi hubungan antara kinerja lingkungan, kinerja sosial, dan kinerja tata kelola terhadap risiko sistematis. Penelitian ini dapat menjadi landasan bagi perusahaan untuk memperkuat dan meningkatkan kinerja lingkungan, sosial, tata kelola (ESG), dan keberagaman gender di jajaran direksi untuk mengurangi risiko sistematis dan memenuhi harapan para pemangku kepentingan.

**Kata Kunci:** Keberagaman gender; Lingkungan; Risiko sistematis; Sosial dan tata kelola (ESG).

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**Profile and corresponding author:**

*Fivi Anggraini from Faculty of Economics and Business, Universitas Bung Hatta, Indonesia.*

## INTRODUCTION

Investment is the strategic allocation of capital or surplus resources with the expectation of generating future economic benefits, undertaken under conditions of uncertainty and potential risk, (Albuquerque et al., 2019). Return is one of the driving factors for investors to invest and represents a reward for their willingness to bear the risks associated with the investment made. In addition to considering return, investors should also consider their level of investment risk when making investment decisions (Choy, 2023). According to it is an uncertainty in the future, in this case there is a possibility of a difference between return What investors expect with return actually. Rattanakom et al. (2023) Divide stock investment risks into two types, namely unsystematic risk and systematic risk. Unsystematic risk is a risk that can be eliminated by forming a new portfolio, (Choy, 2023). Meanwhile, systematic risk known as market risk or general risk is a risk related to changes that occur in the market as a whole and cannot be controlled (Muhammad & Migliori, 2023). Systematic risk measurement is commonly used of an investment is beta (Romando, 2020). Beta is a measure of volatility return a stock or portfolio to market changes. To overcome these risks, companies need to implement effective and flexible risk management strategies (Oanh & Huong, 2023). Based on the phenomenon that occurs in manufacturing companies in Indonesia related to systematic risks, it can be seen in table 1.

**Tabel 1.** Systematic Risks of Manufacturing Companies in 2019-2023

No.	Company Name	Code	Systematic Risk ( $\beta$ )				
			2019	2020	2021	2022	2023
1	PT. Astra International	ASIA	1.16	1.50	0.05	2.89	0.62
2	PT. Barito Pacific	BRPT	-0.60	1.95	2.93	0.56	1.48
3	PT. Chandra Asri Petrochemical	TPIA	0.49	1.88	-0.89	1.11	2.09
4	PT. Impack Primary Industries	IMPC	-0.22	0.14	0.70	1.54	-0.79
5	PT. Indocement Tunggul Prakasa	INTP	0.82	1.18	0.76	0.11	1.60
6	PT. Japfa Comfeed Indonesia	JPFA	2.47	1.61	-0.57	-0.22	-0.92
7	PT. Kalbe Farma	KLBF	1.14	0.50	0.34	-0.13	-0.09
8	PT. Merck Indonesia	BRAND	0.08	0.29	0.47	-0.07	0.31
9	PT. Waskita Beton Precast	WSBP	1.29	2.61	2.31	-0.10	0.42
10	PT. Wijaya Karya Beton	WTON	1.72	2.26	1.54	1.10	1.25
<b>Average</b>			<b>0.83</b>	<b>1.39</b>	<b>0.76</b>	<b>0.68</b>	<b>0.60</b>

**Source:** www.finance.yahoo.com, 2024.

Based on table 1 above, it is explained that beta ( $\beta$ ) Shares of manufacturing companies from 2019 to 2020 experienced a very extreme increase. Meanwhile, from 2021 to 2023 it has decreased. This indicates that there is a systematic fluctuation of the company's stock risk is greater than the systematic risk of the market. One of the indicators of investor decision making in investment decision-making is the implementation of optimal ESG performance (Shakil, 2021). Al Amosh and Khatib (2023) defining performance environmental, social, and governance (ESG) is the level of corporate compliance with social responsibility and the fulfillment of the aspirations of stakeholders, such as investors, suppliers, lenders, and the surrounding community. The concept of ESG includes three dimensions: first, environmental which focuses on corporate responsibility to the environment, second social that measure its relationship with stakeholders, and third, governance who assess the management and decision-making process (Oanh & Huong, 2023). According to Maharani and Astuti (2024) strong ESG performance can reduce systematic risks The company is able to identify potential environmental, social, and governance impacts that can affect the stability of the company.

Several studies have investigated how environmental, social, and governance (ESG) performance contributes to corporate stability and the mitigation of systemic risk. In Thailand, Rattanakom et al. (2023) found that ESG adoption among manufacturing firms remains low, despite its recognized importance for long-term stability in global markets. In India, Gupta et al. (2022) demonstrated that superior ESG performance reduces firm risk and enhances shareholder value, highlighting its stabilizing effect on company performance. Similarly, in Korea, Choy (2023) reported that effective ESG management provides firms with a competitive advantage and serves as a buffer against crises, thereby reducing systemic vulnerability. In the Indonesian context, empirical evidence remains limited; however, Annisa & Hartanti (2021) observed that ESG implementation in ASEAN firms is associated with lower corporate risk. Supporting this, Vasconcelos et al. (2023) and Wamba et al. (2020) confirmed that strong ESG performance significantly decreases systematic, non-systematic, and total risks in publicly listed companies. Collectively, these findings suggest that higher ESG performance strengthens corporate stability and resilience, ultimately reducing exposure to systemic risk across different regional settings.

Gender diversity on corporate boards has the potential to reduce systematic risks because decision made by women tend to be more responsive and holistic and broaden perspectives on potential risks (Al-Jaifi, 2020). According to Haque & Ntim (2018) and Shakil (2021), female board members are more effective in identifying and managing risks, thereby enhancing corporate stability and performance sustainability. Muhammad et al. (2023) found that the presence of more women on boards of directors strengthens governance oversight and corporate benefits in Italy. Similarly, Vasconcelos et al. (2023) reported that gender diversity mitigates systemic risk and provides valuable insights for policymakers and investors in Brazil. Nadeem et al. (2019) observed that UK firms with a higher proportion of female board members experience lower volatility and risk, while Sila et al. (2016) found similar evidence among European companies. In Indonesia, Sofianty et al. (2022) demonstrated that gender diversity directly reduces the risk level of public firms. Considering the limitations of previous studies, it can be concluded that research on gender diversity and systematic risk requires broader cross-country perspectives and more comprehensive analytical approaches. Future studies should further explore the mechanisms through which female board representation influences

corporate stability and resilience.

The novelty of this study lies in its focus on gender diversity as a moderating variable in the relationship between ESG performance and systematic risk. This area remains underexplored in existing literature. By concentrating on manufacturing firms in Indonesia, an emerging economy where ESG implementation is still developing, this research offers fresh empirical evidence on how board gender diversity reinforces the stabilizing effect of ESG practices. The findings thus contribute to the advancement of stakeholder theory and resource dependency theory by highlighting the strategic role of gender inclusive governance in enhancing corporate resilience.

## **LITERATURE REVIEW**

The conceptual framework, the underlying rationale of the study, and relevant theories from organizational and strategic management are utilized to explain the relationship between ESG performance and corporate risk. The theoretical foundation of this study is grounded in Stakeholder Theory (Freeman, 1984) and the Resource-Based View (Barney, 1991). Stakeholder Theory emphasizes the importance of managing relationships with various stakeholders to maintain legitimacy, trust, and long-term stability. This makes ESG performance a crucial mechanism for aligning corporate actions with stakeholder expectations. Meanwhile, the Resource-Based View posits that superior ESG practices and governance mechanisms are valuable, rare, and difficult to replicate resources that can enhance a firm's competitiveness and reduce its risk exposure. Together, these theories create a comprehensive framework for understanding how ESG performance contributes to corporate resilience and sustainable value creation.

Environmental performance measures how effectively an organization manages its environmental impact. It encompasses various aspects, including the utilization of natural resources, pollution control, waste management, energy efficiency, compliance with environmental regulations, and the implementation of sustainability practices (Chasbiandani et al., 2019). Companies are required to address environmental issues that emerge as a result of poor environmental performance.

Environmental disclosure not only fulfills regulatory requirements but also fosters stakeholder trust and enhances transparency in managing a company environmental impact, (Sassen et al., 2016; Haque & Ntim, 2018). According to Suttipun (2023), investor confidence increases when companies effectively report their environmental disclosures.

Companies that demonstrate strong environmental performance are better equipped to mitigate corporate risks and build trust with their stakeholders. According to Grisales and Caracuel (2021), firms that effectively manage their environmental performance demonstrate accountability to their surrounding environment, thereby enhancing their corporate image and reducing exposure to systematic risk. Wamba et al. (2020) discover that environmental factors significantly influence a company's financial risk, highlighting the importance of integrating sustainability into corporate governance practices in Europe. Building on this, Rattanakom et al. (2023) demonstrated that ESG performance affects the systematic risk of firms listed on the Thai Stock Exchange, thereby reinforcing the notion that responsible environmental and social management contributes to financial stability. Similarly, Choy (2023) found that companies in Korea with stronger ESG performance tend to experience lower risk levels. Collectively, these findings strengthen

the argument that sustainable, socially, and environmentally responsible practices play a vital role in mitigating corporate risk across various economic and institutional contexts. Therefore, this study seeks to address this gap by empirically examining the effect of environmental performance on systematic risk within the context of Indonesia as an emerging market.

**H<sub>1</sub>:** Environmental performance negatively affects systematic risk.

Shakil (2021) defines social performance is a facet of corporate social responsibility that enhances corporate operational and strategic activities. High levels of public trust improve access to critical resources, particularly capital, while also fostering reputational advantages. Companies demonstrating superior social performance tend to receive greater public recognition and maintain more harmonious stakeholder relationships (Lueg et al. 2019). Although macroeconomic factors such as interest rates and inflation remain central determinants of systemic risk positive social performance strengthens firm resilience to market volatility and external shocks (Albuquerque et al. 2019). Consequently a company proactive commitment to social responsibility is essential for mitigating systemic risk and enhancing long term stability (Benlemlih & Bitar, 2018). Furthermore, Shakil (2021) stated that investment in corporate social responsibility not only provides benefits in social and governance aspects also contribute to reducing the company exposure to systemic risks. Research conducted by Altunbas et al. (2020) shows that the environmental, social, and governance score, especially in the disclosure of social aspects, plays a role in reducing corporate risk and capital costs in the next period. However, despite extensive evidence on the link between social performance and corporate risk across contexts, limited empirical research has examined how social performance mitigates systematic risk in emerging markets such as Indonesia, where institutional frameworks and stakeholder expectations differ significantly from those in developed economies.

**H<sub>2</sub>:** Social performance negatively affects systematic risk.

Corporate governance performance plays an important role in controlling management, (Rahma & Rokhim, 2022). Good governance includes the structure of the board of directors regulatory compliance and relationships with stakeholders to ensure responsible operational sustainability (Gupta et al. 2022; Maharani & Astuti, 2024). Superior governance performance reflects the company ability to manage and supervise effective and transparent management policies and practices that contribute to the reduction of systematic risk (Caluwe et al. 2024). From the perspective of creditors governance performance is used to understand non-financial activities and strategies as well as financial activities thereby helping in risk mitigation (Suttipun, 2023). Despite growing evidence on the role of governance performance in reducing systematic risk, limited research has examined its effectiveness in emerging markets such as Indonesia.

**H<sub>3</sub>:** Governance performance has a negative effect on systematic risk.

Gender diversity in the company board of directors plays an important role in moderating the relationship between environmental performance and systematic risk (Glass et al. 2016). More gender-diverse boards tend to have a variety of perspectives and approaches that can improve the quality of decision-making related to environmental policy. Setiani and Novitasari (2024) performance environmental a good one not only improves the reputation and operational efficiency, but also reduces systematic risks by better anticipating regulatory changes and market shifts. This encourages companies to invest more in sustainable practices, such as emission reduction and efficient resource



management, which in turn improves performance environmental Company. Thus, gender diversity in the board can strengthen the company's resilience to external risks and support its long-term sustainability (Wamba et al. 2020). Shakil (2021) found that gender diversity on the board had a significant moderate influence on the relationship between ESG and systematic risk. Companies with higher female members have lower volatility and risk (Nadeem et al., 2019; Qayyum et al. 2020). A board consisting of male and female members faces less risk than a male-dominated board (Sila et al. 2016). This may be the case because female council members prefer to take smaller risks. Despite existing evidence, limited studies have examined the moderating role of gender diversity between environmental performance and systematic risk in emerging markets like Indonesia.

**H<sub>4</sub>:** Environmental performance negatively affects systematic risk with gender diversity of the board as a moderation variable.

Gender diversity on company boards plays an essential role in improving social performance while reducing systemic risks, as stated by Romano et al. (2020). Gender diversity on company boards plays an essential role in improving social performance while reducing systemic risks, as stated by Romano et al. (2020). The presence of council members who reflect diverse backgrounds and experiences makes the decision-making process more inclusive and reflective of community needs. From this perspective, gender diversity not only strengthens integration in decision-making but also reduces the risk of bias, as shown by Romano et al. (2020) and Amorelli and García-Sánchez (2021). By integrating multiple perspectives, boards can identify and manage systematic risks more effectively while maintaining a focus on achieving sustainable social performance, as Dorfleitner and Grebler (2022).

Gender diversity is not only an essential principle of equality but also strengthens the company's position within complex market dynamics, as explained by Muhammad & Migliori (2023). Vasconcelos et al. (2023) demonstrated that board diversity can reduce systematic risk and provide policymakers and investors with valuable insights. The presence of directors with specialized skills and independence can help reduce the company's systematic risks. Romano et al. (2020) stated that gender diversity affects ESG scores, which indicates that a balanced number of male and female directors on a company board plays a vital role in sustainability performance. This evidence highlights a research gap regarding how gender diversity moderates the relationship between social performance and systematic risk in emerging markets, where governance practices and cultural contexts differ significantly from those in developed economies.

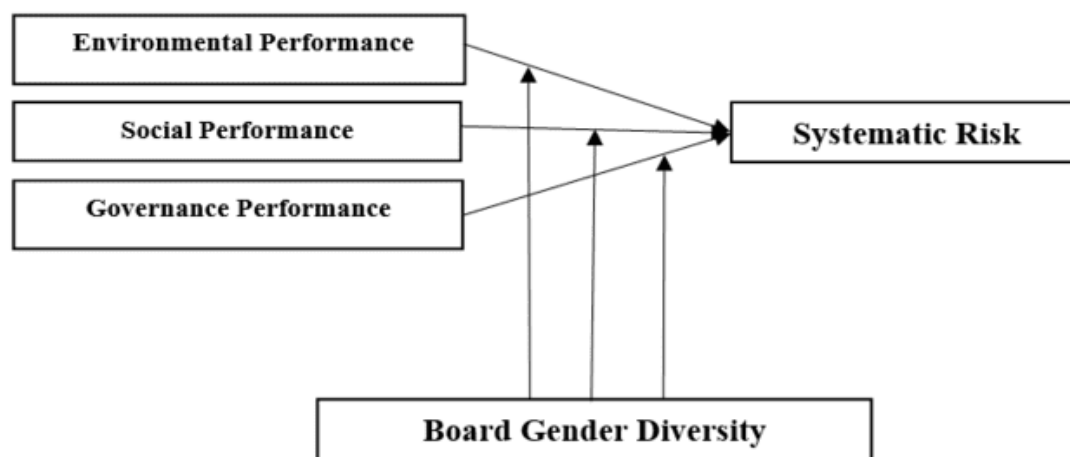
**H<sub>5</sub>:** Social performance has a negative effect on systematic risk with gender diversity of the council as a moderation variable.

Gender diverse boards tend to bring a variety of perspectives and approaches that can improve the quality of oversight and decision making, ensuring practice governance that are more transparent and accountable. Female board members are often more proactive in pushing for policies focused on integrity and ethics, strengthening corporate governance structures (Shakil, 2021). Governance Strong helps companies better reduce systematic risks through effective risk management and regulatory compliance. Gender diversity on boards strengthens the link between good corporate governance and systematic risk reduction, and enhances the company's long-term resilience and sustainability (El-Sood, 2018). Setiani and Novitasari (2024) gender diversity affects ESG scores and encourages sustainable value creation. Muhammad et al. (2023) said the importance of encouraging female participation in the boardroom particularly from the

perspective of systematic risk-taking of companies in Italy. Companies would be better off having more women on the board of directors, as diversity helps highlight benefits and monitor the impact of corporate governance. Based on Agency Theory (Jensen & Meckling, 1976) and Resource Dependence Theory (Pfeffer & Salancik, 1978), gender-diverse boards enhance monitoring effectiveness and decision quality, thereby strengthening the relationship between governance performance and systematic risk reduction. This highlights a research gap in understanding how gender diversity moderates the relationship between governance performance and systematic risk, particularly within the context of emerging markets where governance structures and gender representation differ significantly.

**H<sub>6</sub>:** Governance performance has a negative effect on systematic risk with the gender diversity of the board as a moderation variable.

The conceptual framework of the research is described as follows



**Figure 1.** Conceptual Framework.

## RESEARCH METHOD

### Research Design and Data

This study adopts a quantitative explanatory research design aimed at empirically testing the causal relationships between environmental, social, and governance (ESG) performance and systematic risk. The explanatory approach allows for identifying the direction and magnitude of these relationships using secondary data from publicly listed firms, thereby ensuring analytical rigor and generalizability of the findings.

The population of this study is all manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the 2019–2023 period. The sample used in this study consists of manufacturing companies listed on the IDX during 2019–2023 selected through a purposive sampling method. Based on the sampling criteria, 16 companies with 159 firm-year observations met the requirements. The data used in this study consist of annual reports and sustainability reports obtained from the official IDX website ([www.idx.co.id](http://www.idx.co.id)). In general, the process of collecting company samples can be seen in table 2 below:

## Data Analysis Method

The data were analyzed using a quantitative approach with panel data regression analysis to examine the effects of ESG performance on systematic risk and the moderating role of board gender diversity. This method allows controlling for both cross-sectional and time-series variations, providing robust and reliable estimates. Before hypothesis testing, descriptive statistics, multicollinearity tests, and model selection tests (common, fixed, and random effects) were conducted to ensure model validity.

Hypotheses were tested using multiple regression analysis with interaction terms to evaluate the moderating effect of gender diversity on the relationships between ESG dimensions (environmental, social, and governance) and systematic risk. All statistical analyses were performed using Gretl software to ensure precision and reproducibility of the results.

**Table 2.** Sample Selection Procedure

No	Information	Total
1	Consistent manufacturing companies listed on the IDX during the 2019-2023 period	159
2	Manufacturing companies that did not publish annual reports consistently during the 2019-2023 period	(45)
3	Manufacturing companies that did not publish sustainability reports consistently during the 2019-2023 period	(98)
4	Number of samples	16
5	Observation results	80

**Source:** Sample Selection Procedure Results.

Table 2 indicates that the total number of manufacturing businesses listed on the Indonesia Stock Exchange from 2019 to 2023 is 159. Of these, only 16 companies satisfy the sample conditions, resulting in 80 data points for observation.

## Operational definition and measurement of variables

### Systematic Risk

Systematic risk is a risk that cannot be eliminated by diversifying, as this risk is influenced by macro factors that can affect the company as a whole (e.g. market risk, inflation rate and crisis). In this study, systematic risk was measured using beta stocks ( $\beta$ ). Beta is a systematic measure of the risk of a security or portfolio relative to the stock price (Choy, 2023). Beta measurement of a stock can be done using the Single Index Model. This model assumes that stock returns correlate with changes in market returns, and to measure this correlation can be done by linking individual stock returns ( $R_{it}$ ) with market index returns ( $R_{mt}$ ).

$$R_{it} = \alpha_i + \beta_{it} R_{mt} + e_{it}$$

Where:

$R_{it}$  = Return of asset (or stock)  $i$  at time  $t$  the actual return generated by the asset during a specific period.

$\alpha_i$  = Intercept term (alpha) represents the expected return of the asset  $i$  when the market return  $R_{mt}$  is zero.

$\beta_i$  = Beta coefficient of asset  $i$  at time  $t$  measures the systematic risk or sensitivity of the asset to the market.

$R_{mt}$  = Market return at time  $t$  the return of the overall market.

$e_{it}$  = Error term (residual) represents the unsystematic risk.



Systematic risk is a component of market risk that depends on investors perceptions of overall market conditions. These perceptions influence fluctuations in stock prices and reflect changes in investors expectations regarding the company future prospects. This concept is supported by Choy (2023) who emphasizes the role of investor sentiment in determining systematic market behavior. Calculate *the market return* in the period as follows:

$$R_{mt} = \frac{(P_{MT} - P_{MT-1})}{P_{MT-1}}$$

Where:

$R_{mt}$  = Market return at the end of the month to t.

$P_{mt}$  = Market price closing at the end of the month to t.

$P_{mt-1}$  = Closing price of the market at the end of the previous month (t-1).

The calculation of the return value of stocks using the closing stock price indicator, (J. H. Choy, 2023) uses the following equation:

$$R_{it} = \frac{(P_t - P_{t-1})}{P_{t-1}}$$

Where:

$R_t$  = Return of shares at the end of the month to t.

$P_t$  = *Closing price* at the end of the month to t.

$P_{t-1}$  = *Closing price* in the previous month's quarter (t-1).

### **Environmental Performance**

Environmental performance represents one of the key components of ESG. Its measurement follows the Global Reporting Initiative (GRI, 2016) guidelines. Specifically, companies apply the GRI 300 series, which covers environmental topics across 30 disclosure indicators. The measurement of this variable is the comparison between the number of environmental items disclosed by the company divided by the number of expected items (Grisales & Caracuel, 2021).

### **Social Performance**

Social performance is important for the company because it can create a good relationship between the company and the environment and the surrounding community. The measurement of social performance refers to the Global Reporting Initiatives GRI (2016) guide, the company uses the GRI series 400 on social topics with a total of 34 disclosure indicators. The measurement of this variable is the comparison between the number of social items revealed by the company divided by the number of expected items (Grisales & Caracuel, 2021).

### **Governance Performance**

Governance performance is needed to form good management control of a company. The measurement of governance performance refers to the GRI (Global Reporting Initiative, 2016) guidelines. The company adopts the GRI series 102 series on social topics, comprising 27 disclosure indicators. The measurement of this variable is the comparison between the number of governance items disclosed by the company divided by the number of expected items (Grisales & Caracuel, 2021).

## Gender Diversity Council

Board gender diversity refers to the proportion of female directors relative to the total number of board members, reflecting the representation of women in corporate decision-making. This measurement refers to the research conducted Altunbas et al. (2020), Liu and Sun (2021), and Muhammad et al. (2023).

## Analysis Data

This study uses multiple linear regression analysis in conducting hypothesis testing. Multiple linear regression analysis is a straight-line relationship between two or more independent variables and dependent variables. This analysis is used to determine the relationship between the free variable and the bound variable. This test was carried out to see the influence of environmental performance (EP), social performance (SP) and governance performance (GP) on systematic risk (SR) with Board gender diversity (BGD) as a moderation variable. The regression model equation is as follows:

$$SR = \alpha + \beta_1 EP_{it} + \beta_2 SP_{it} + \beta_3 GP_{it} + e_{it} \dots \dots \dots (1)$$

$$SR = \alpha + \beta_1 EP_{it} + \beta_2 SP_{it} + \beta_3 GP_{it} + \beta_4 EP * BGD_{it} + \beta_5 SP * BGD_{it} + \beta_6 GP * BGD_{it} + e_{it} \dots \dots \dots (2)$$

Information:

SR = systematic risk.

$\beta$  = regression coefficient.

EP = environmental performance.

SP = social performance.

GP = governance performance.

BGD = board gender diversity.

EP\*BGD = environmental performance with board gender diversity.

SP\*BGD = social performance with board gender diversity.

GP\*BGD = governance performance with board gender diversity.

e = standard error.

## RESULT AND DISCUSSION

Prior to conducting hypothesis testing, descriptive statistics were computed to provide an overview of the main variables in the study, which included environmental performance, social performance, governance performance, board gender diversity, and systematic risk. The results are summarized in Table 3.

**Table 3.** Descriptive Statistics

Variables	N	Min	Max	Mean	SD
Environmental Performance (EP)	80	0.07	0.97	0.45	0.24
Social Performance (SP)	80	0.03	1.00	0.41	0.23
Governance Performance (GP)	80	0.11	1.00	0.37	0.15
Systematic Risk (BETA)	80	-0.93	3.35	0.75	1.01
Board Gender Diversity (B)	80	0.00	0.47	0.12	0.14

**Source:** Processed Secondary Data, 2024.

Table 3 summarizes the descriptive statistics of the main variables. Environmental, social, and governance performance shows means of 0.45, 0.41, and 0.37, respectively. Board gender diversity is relatively low, with a mean of 0.12, and systematic risk averages 0.75. These results provide a preliminary overview of the dataset prior to regression analysis. The multiple linear regression model is used to determine the influence of environmental, social, and governance performance on systematic risk with the gender diversity of the council as moderation. The results of the multiple linear regression calculation using the

Gretl program, the results of Multiple Linear Regression Model 1 and Model 2 are obtained as follows:

**Table 4.** Results of Multiple Linear Regression Analysis Model 1

Model 1	Coefficient	Std. error	t-ratio
(Constant)	1.403	0.314	4.475
EP	0.236	0.539	0.436
SP	0.221	0.579	0.381
GP	-1.840	0.845	-2.178

**Note:** EP= Environmental Performance; SP= Social Performance; GP=Governance Performance; GDB= Gender Diversity of The Board.

The multiple linear regression analysis of Model 1 shows that the constant variable has a coefficient of 1.4033 with a strong significance level (t-ratio = 4.475). Overall, only the GP variable was shown to have a significant effect in this model, while EP and SP did not show a significant contribution. The regression equations developed in this study are as follows:

$$SR = 1.403 + 0.235 EP + 0.221 SP - 1.840 GP$$

**Table 5.** Results of Multiple Linear Regression Analysis Model 2

Model 2	Coefficient	Std. error	t-ratio
(Constant)	1.569	0.123	12.78
EP	-0.402	0.189	-2.120
SP	0.158	0.226	0.699
GP	-2.600	0.396	-6.559
EP* BGD	-1.997	0.0807	-24.76
SP*BGD	-1.612	0.510	-3.160
GP*BGD	-5.055	1.339	-3.776

**Note:** EP= Environmental Performance; SP= Social Performance; GP=Governance Performance; BGD= Board Gender Diversity.

Overall, the results of the Model 2 data processing in Table 4 indicate that the gender diversity of the council strengthens the negative influence of environmental, social, and governance performance on dependent variables, with the strongest effect on the interaction of GP\*BGD. The regression equation developed for Model 2 in this study is as follows:

$$SR = 1.569 - 0.4017EP + 0.158SP - 2.600 GP - 1.99730 EP*BGD - 1.612 SP*BGD - 5,05502 GP*BGD$$

The results of the test in this study can be seen in table 5 below.

**Table 6.** Results of Hypothesis

	Model 1		Model 2	
	Systematic Risk		Systematic risk	
	Coefficient	P-value	Coefficient	P-value
<i>Independent variables</i>				
EP	0.235	0.664	-0.402	0.037**
SP	0.2207	0.704	0.158	0.487
GP	-1.840	0.033 **	-2.600	0.0001***
<i>Moderation variables</i>				
EP*BGD			-1.997	0.002***
SP*BGD			-1.612	0.002***
GP*BGD			-5.055	0.000***
Constant	1.403	0.000 ***	1.569	0.000 ***

	Model 1		Model 2	
	Systematic Risk		Systematic risk	
	Coefficient	P-value	Coefficient	P-value
Mean dependent variable		0.746		0.746
S.D. dependent variable		1.012		1.012
Sum squared residual		74.525		7.866
S.E. of regression		0.990		0.328
R-squared		0.078		0.903
Adjusted R-squared		0.042		0.895
F		2.152		112.895
P-value(F)		0.101		0.000
Log-likelihood		-110.679		-20.7362

**Note:** \*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1.

**Note:** EP= Environmental Performance; SP= Social Performance; GP=Governance Performance; BGD= Gender Diversity of The Board.

### **The Impact of Environmental Performance on Systematic Risk**

The hypothesis testing results reveal that environmental performance has a significant negative effect on systematic risk among manufacturing firms listed on the Indonesia Stock Exchange (IDX). This finding suggests that stronger environmental performance contributes to mitigating the level of systematic risk faced by manufacturing firms in Indonesia. Companies that oversee environmental factors, like natural resource utilization and pollution mitigation, influence the overall risks encountered by the market. Environmental performance an unfavorable outcome can result in penalties, legal action, or diminished investor confidence, hence elevating systemic risk in the market. The findings of this study are consistent with (Wamba et al. 2020; Rattanakom et al. 2023; Choy 2023) that sustainable and socially and environmentally responsible practices can help reduce the systematic risks faced by companies. However, in contrast to these results (Sassen et al., 2016; Maharani & Astuti, 2024) found insufficient evidence to confirm a significant relationship between non-financial performance and systematic risk, suggesting that the risk-reducing effect of sustainability initiatives may vary across industries and institutional contexts.

### **The Effect of Social Performance on Systematic Risk**

The empirical results indicate that social performance does not exert a detrimental effect on systematic risk among manufacturing firms listed on the Indonesia Stock Exchange (IDX). This suggests that while social engagement initiatives enhance corporate reputation and stakeholder trust, they may not translate directly into reduced market risk exposure (Albuquerque et al., 2019). These findings align with previous studies conducted by (Rahma & Rokhim, 2022; Annisa & Hartanti, 2021; Benlemlih & Bitar, 2018), which similarly found that social performance exerts an insignificant influence on systematic risk, underscoring the limited short-term market implications of firms' social activities. Systematic risk is more often associated with broader macroeconomic factors, such as changes in interest rates, global economic conditions, or government policies that affect the entire market. Furthermore, the results of this study differ from that of the study (Triyani et al., 2021; Lueg et al., 2019) argue that ESG scores and in particular disclosures social can reduce systematic risks and capital costs in the next period, potentially reducing capital costs and risks faced in the market.

### **The Impact of Governance Performance on Systematic Risk**

The findings of the third hypothesis test indicated that performance governance significantly affects systematic risk in manufacturing firms listed on the IDX. The findings suggest that effective corporate governance enhances openness in systematic risk management, bolstering investor and market participant confidence in the organization. This trust aids companies in achieving excellent stability and consistency under market constraints, such as regulatory alterations or volatile economic circumstances. The results of this study are in line with the research conducted Shakil (2021), Triyani et al. (2021) and Gupta et al. (2022) It is evident that superior ESG performance reduces company risk and helps improve shareholder valuation. Companies that have good governance usually also adhere to ethical and legal standards, reducing legal or reputational risk effectively can reduce stock volatility and overall corporate risk. However, the results of this study are not in line with the research conducted by Rattanakom et al. (2023) in Thailand that finds performance governance does not have a negative effect on systematic risk. In Thailand, the ESG score based on the definitive of companies listed in the technology sector increases, so the systematic risk will increase. The results of this study are not significant due to rapid technological changes in the digital era, thus posing a huge technological risk in the future.

### **Environmental Performance on Systematic Risk with Gender Diversity as A Moderation Variable**

This study demonstrates that organizations with board members of diverse genders are more effective in addressing environmental challenges. Diverse viewpoints and methodologies in decision-making enable organizations to be more responsive and proactive in addressing environmental concerns. Inclusive governance practices strengthen corporate sustainability mechanisms by mitigating risks associated with environmental factors. The findings of this study are consistent with previous research (Shakil, 2021; Nadeem et al., 2019; Qayyum et al., 2020; Sila et al., 2016), which documented a positive and significant relationship between board gender diversity and ESG performance, suggesting that gender-diverse boards contribute to more comprehensive sustainability strategies and improved corporate accountability. This shows that more gender-diverse boards tend to improve a company's ESG score, reflecting better practices in ESG aspects. With board members from different gender backgrounds, more diverse perspectives emerge in decision-making, so more diverse boards can manage risk more effectively and proactively. Companies with male and female members face less risk than male-dominated boards. This may be the case because female council members prefer to take smaller risks.

### **Social Performance Against Systematic Risks with Gender Diversity as A Moderation Variable.**

The findings of this study suggest that female directors contribute unique perspectives and competencies that enhance the management of systemic risks. Female directors generally exhibit a heightened awareness of social performance, enabling them to more effectively detect and mitigate hazards related to social performance. Moreover, the gender diversity of the board might enhance the company's capacity to handle systemic risk, as female directors may contribute superior analytical and decision-making abilities. Female directors can recognize hazards related to social performance and devise ways to mitigate those risks. The results of this study are in line with Vasconcelos et al. (2023)



and Romano et al. (2020) found that the gender diversity of the board negatively affected systemic risk. In line with the resource dependence theory proposed by Pfeffer & Salancik (1978), larger and more interconnected boards are better positioned to evaluate and manage risks. This advantage arises not only from broader director participation but also from the board's extensive organizational reach, encompassing diverse expertise and skills that enhance strategic decision-making. Board gender diversity significantly influences ESG scores, indicating that a balanced representation of male and female directors plays a crucial role in enhancing corporate sustainability performance.

### **Governance Performance Against Systematic Risks with Gender Diversity As a Moderation Variable**

The board is comprised of multiple genders and may offer diverse opinions. Gender-diverse councils generally demonstrate enhanced effectiveness in governance oversight. They possess excellent expertise in detecting potential risks that may emerge. Moreover, gender diversity on the board enhances investor confidence. All of these elements contribute to the mitigation of systemic risk. The research findings are consistent with those of Setiani & Novitasari (2024) as well as Muhammad et al. (2023). found that to gender diversity affects ESG scores. Companies must pay attention to board attributes to improve their ESG scores, encourage sustainable value creation, and stakeholder confidence in ESG excellence. Companies would be better off having more women on the board of directors, as diversity helps highlight benefits and monitor the impact of corporate governance.

### **CONCLUSION**

This study successfully demonstrates that environmental performance adversely affects systemic risk. Companies must maintain strong environmental practices; otherwise, inadequate performance can lead to fines, lawsuits, or diminished investor confidence, increasing systemic market risks. Similarly, governance performance has also been shown to impact systemic risk negatively. This suggests that effective organizational governance improves transparency in managing systemic risks and ensures compliance with regulations. The implication is that the corporation values its stakeholders and contributes positively to society without significantly influencing systemic risks in financial markets. While social performance plays a significant role in enhancing corporate reputation, it does not exert an immediate influence on systemic risk within the broader market. Moreover, gender diversity within the board has been shown to mitigate the impact of environmental, social, and governance (ESG) performance on systemic risk. Specifically, superior environmental performance is positively associated with greater gender diversity on the board, which enhances a firm's capacity to effectively address ecological challenges. A multifaceted approach in decision-making allows firms to be more responsive and proactive in tackling challenges while mitigating risks related to environmental issues.

Furthermore, gender diversity on the board also diminishes the impact of social performance on systemic risk. Female directors typically demonstrate a greater awareness of social performance, which enables them to identify and manage risks more effectively. This suggests that female directors may possess stronger analytical and decision-making skills. Additionally, board diversity helps mitigate the effects of governance performance on systemic risk. This means that various aspects of governance, including transparency

and accountability, are better evaluated, leading to more effective oversight of management and quicker identification of potential threats. As a result, the organization achieves more excellent stability and resilience when facing various challenges and fluctuations in market dynamics findings. The study confirms that its empirical findings support stakeholder theory and resource dependence theory, which collectively explain that aligning corporate strategies with stakeholder expectations and strengthening governance structures can enhance legitimacy, stability, and resource accessibility.

This study has several limitations. First, variations in ESG reporting, as some companies have not adopted widely recognized standards like GRI, may affect data comparability. Second, the focus on manufacturing firms listed on the Indonesia Stock Exchange limits the generalizability of the findings. Future research should employ widely accepted ESG frameworks, expand samples across industries and regions, and consider longitudinal or multi-country designs. Additionally, exploring other moderating or mediating variables, such as board independence, firm size, or market conditions, could further enhance theoretical and practical insights into ESG performance and systematic risk.

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