Print ISSN: 2288-4637 / Online ISSN 2288-4645
doi:10.13106/jafeb.2021.vol8.no12.0191

The Effect of Corporate Governance on the Board of Directors' Characteristics and Sustainability Disclosure: An Empirical Study from Thailand

Malee JATURAT[1], Kusuma DAMPITAKSE[2], Chanongkorn KUNTONBUTR[3]

Received: August 15, 2021 Revised: October 23, 2021 Accepted: November 01, 2021

Abstract

The objective of this research is to investigate how the board of directors' characteristics influence sustainability disclosures with the mediating effect of corporate governance. The independent variables are the characteristics of the board of directors, which consist of the presence of women on the boards, presence of directors aged over 50 years old, education level, education field, board tenure, and compensation. The dependent variable is sustainability disclosures, which is measured by the GRI standard disclosure, whereas the mediator variable is the CG score. Research samples are 460 companies listed on the Stock Exchange of Thailand (SET). Path Analysis is used to examine the correlation between the board of directors' characteristics, CG score, and GRI standard disclosure. The research findings show that senior boards, the education field, and compensation motivation have an effect on sustainability disclosures, whereas corporate governance is a mediator of the effect of the education field of boards on sustainability disclosures. This finding should help shareholders to choose individuals with suitable characteristics to serve on the board of directors, and, as a result, shareholders should anticipate a profitable result to be generated, while the business of the company is conducted in a sustainable way.

Keywords: Board of Directors' Characteristics, Sustainability Disclosures, Corporate Governance, GRI Standard

JEL Classification Code: M14, M48, G34

1. Introduction

The board of directors is a group of people with knowledge, experience, responsibility, and a duty to provide good corporate governance. The members of the board are elected as company leaders and act as shareholders' representatives in overseeing the business to achieve effectiveness, profitability, and sustainability. The responsibilities of the board of directors begin with goal setting and assignment of responsibilities and roles to the operations department. This includes overseeing the actions of corporate executives, managers, and staff to ensure transparency, audit ability, and compliance with firm objectives, and to protect the interests of other stakeholders. Thereafter, each board will appoint a CEO to implement the organization's policies and goals. It is the duty of the board of directors to follow up and supervise to ensure that the CEO works with accountability.

However, the board of directors may have transparency or agency problems that may lead to a negative impact on shareholders or the organization. There are a number of examples of these types of problems. First, moral hazard problems may exist; this arises when there is a conflict of interest between agents and shareholders, which may result in agents seeking to advance their own interests rather than

[1]First Author. Assistant Professor, Faculty of Business Administration, Rajamangala University of Technology Thanyaburi, Pathum Thani, Thailand. ORCID ID: 0000-0001-6370-1793. [Postal Address: 39 Moo1 T. Klong 6 A. Thayaburi Pathum Thani Province, 12110, Thailand] Email: malee_j@rmutt.ac.th
[2]Corresponding Author. Assistant Professor, Faculty of Business Administration, Rajamangala University of Technology Thanyaburi, Pathum Thani, Thailand. ORCID ID: 0000-0003-3662-9831. [Postal Address: 39 Moo1 T. Klong 6 A. Thayaburi Pathum Thani Province, 12110, Thailand] Email: kusuma@rmutt.ac.th
[3]Asscociate Professor, Faculty of Business Administration, Rajamangala University of Technology Thanyaburi, Pathum Thani, Thailand. ORCID ID: 0000-0002-4863-1034.
Email: chanongkorn_k@rmutt.ac.th

those of the shareholders. Because they do not fulfill their function correctly, independent boards of directors with close ties to the CEO may have a negative impact on corporate governance practices. Another example is managerial issues arising from the management of funding sources for various projects. Social issues involving the government, society, or the environment can have a negative impact on communities and the environment, resulting in issues such as wastewater, noise, and air pollution. A final example is the time period problem, which arises when the agent has a contract with a short time to expiration; at the end of the contract, the shareholders must evaluate the board member's work and sign a new contract. This may result in agents who focus on short-term profits rather than long-term gains and sustainability.

Generally, companies face broad issues such as operational transparency, honesty, social and environmental responsibility, and ethical issues. Although large companies have been operating for a long time, some companies have encountered management problems. For example, Enron Corporation, an American energy company, declared bankruptcy in 2001 because the executive staff failed to be transparent when manipulating the financial system. WorldCom Corporation declared bankruptcy in 2003, due to incorrect application of generally accepted accounting principles. In an effort to prevent these sorts of problems, the Organization for Economic Co-operation and Development (OECD) proposed the "Corporate Governance" concept for the guidance and supervision of businesses. Corporate governance comprises the structure and process for guiding the relationship between the board of directors and executive directors to create a competitive advantage that leads to company growth and provides value to shareholders.

The board of directors is responsible for overseeing the actions of the management. The board is more able to forecast the results of company operations with effective corporate governance. Through action monitoring, operation measurement, policy communication, and CEO evaluation, the board is better able to predict the results of business operations. The enhancement of the board of directors' ability to monitor the firm can help to develop good corporate governance practices. There are research studies related to corporate governance, such as Danoshana and Ravivathani (2019), who found a positive relationship between good corporate governance and company performance. A company that has good corporate governance will maintain shareholder confidence in the board of directors to perform their duties, and the presence of good corporate governance helps investors and stakeholders make good decisions.

When it comes to ensuring the long-term sustainability of an organization, the executive body is the most essential element to consider, and the characteristics of the board of directors are a crucial factor to consider when it comes to decision-making and policy development. The executive represents shareholders in his role as a manager and is tasked with generating earnings for investors. In the past, organizations had to cope with representative dishonesty and inadequate board monitoring, which resulted in corruption or misleading public reporting, as well as damage to the company's reputation and eventual collapse. When working as a representative of a company, management demands not just honesty and ethics, but also caution in judging the company's long-term viability. In most cases, a board of directors made up of individuals who are educated, experienced, and ethical, and who are not related to the CEO, will be chosen to oversee the CEO's business activities.

Previous research looked into the qualifications of various boards of directors in the hopes of improving management's overall knowledge and understanding to assure quality monitoring and follow-up. The majority of corporate governance studies, on the other hand, have examined the structure of the board of directors in relation to independent factors such as board members, the board size, shareholders, or shareholding structure as a proxy for corporate governance. Only a few studies have focused on the board's qualities, and none of them have explicitly indicated the outcomes of certain attributes. Thus, this study is interested in investigating the different qualifications of the board of directors to learn how they influence good corporate governance and sustainability disclosures.

The purpose of this research is to study board of directors' characteristics, and the effect of those characteristics on the sustainability disclosures of the companies listed on the SET, focusing on whether these characteristics encourage good corporate governance and continuously lead to company sustainability.

2. Literature Review

2.1. Upper Echelon

The Upper Echelon Theory explains the relationship between the board of directors' essential characteristics and their vision for organization strategies that lead to operational excellence in organizational strategy (Hambrick & Mason, 1984). Upper Echelon Theory states that the characteristics of the board of directors are an important aspect of firm performance (Tulung & Ramdani, 2016), and these characteristics include knowledge, experience, education, age, gender, and personality. To run a business in a sustainable manner, the board of directors must guide the organization to success, provide high performance, and contribute to the achievement of sustainable growth. The directors are those who define the vision of an organization, establish objectives, and create methods for achieving those visions and goals. They also decide how to drive the company to operational excellence and achieve long-term development and profitability. Different fundamental characteristics of the board of directors may have an impact on firm performance and corporate sustainability differently.

2.2. Agency Theory

Agency Theory is a theory that explains the connection between shareholders/owners and a corporate executive (Jensen & Meckling, 1976). As defined by agency theory, company owners who are unable to make independent choices in their companies owing to a lack of knowledge, competence, or experience must rely on an agent to make decisions on their behalf. Corporate governance and the CEO who functions as a business executive while also monitoring business decisions to guarantee that the company operates efficiently, honestly, and transparently, and also taking anti-corruption measures, are covered by this theory. The agency problem occurs when the principal and agent work for the same company but have opposing goals and interests. The agency problem is commonly addressed as a problem between the principal and the agent, which Panda and Leepsa (2017) identified three types of agency problems in their research: (1) disagreements between the principal and the agent, (2) disagreements between the principal (major owners) and the principal (minor owners), both of whom have different share sizes, and (3) disagreements between the principal and the creditor in the context of a high-risk project investment.

2.3. Board of Directors

An essential factor that may influence organizational decision-making processes and long-term sustainability is the board of directors' characteristics. Boards must take responsibility for the organization leaders, have the obligation to control and scrutinize subordinates to achieve the company results (McFarland, 1979). When determining whether a company will succeed or fail, the board of directors may be the most important factor to consider. They are the people who will create strategies and policies that will have an impact on the company's long-term sustainability. As a result, shareholders must select their board members carefully and evaluate a range of qualities and traits. Shareholders must carefully choose board members who will develop plans and policies that will affect the company's long-term survival.

2.4. Corporate Governance

The board of directors is a representative of shareholders who oversee the operation of the company to ensure its long-term success and development. In addition to its assigned responsibilities, the board of directors is responsible for monitoring and overseeing the CEO to ensure that the company activities are transparent and accountable. Corporate governance is the system of rules, practices, and processes by which a company is directed and controlled. Corporate Governance refers to the way in which companies are governed and to what purpose. It identifies who has power and accountability, and who makes decisions. The board of directors' responsibilities begins with setting a goal and delegating tasks and functions to the operations department, as well as monitoring them to ensure transparency, auditability, and compliance with the board's objectives while minimizing adverse effects on other stakeholders. Therefore, the principles of good corporate governance are applied to every aspect of business, and the role of business and society in supporting the synergy of good corporate governance is critical to its success (Setyahadi & Narsa, 2020). There are studies that have been performed in the past that show that excellent corporate governance may have an effect on a company's success, for example, Rose (2016), who discovered a positive correlation between return on equity, return on assets, and good corporate governance.

2.5. Sustainability

A sustainable organization is one that can continue operating uninterrupted and must consider stakeholders in terms of environmental, social, and economic factors to achieve sustainable development goals. The subject of sustainability is gaining considerable attention. The United Nations has advocated for and planned for sustainable development with the goal of increasing ethical and moral knowledge, as well as awareness of the importance of environmental and social stewardship, concurrently with economic growth. The United Nations established Sustainable Development Goals (SDGs) to serve as a framework for action between 2015 and 2030

In Thailand, the Stock Exchange of Thailand has been using the concept of sustainability since 2012 to educate listed businesses on how to include sustainability concepts into their yearly financial reporting. The Thailand Stock Exchange uses the term "Thailand Sustainability Index" to evaluate an organization's sustainability across three dimensions: economic, environmental, and social, using the Organization for Economic Cooperation and Development (OECD) evaluation form. Loh et al. (2018). Since Thailand's economic crisis in 1996, businesses and organizations have been attentive and focused on sustainability management to ensure the immunity of their activities.

3. Conceptual Framework

3.1. The Board of Directors' Characteristics and Sustainability Disclosure

The board of directors is the organization's leader who responds to and commits to developing business strategies that are then implemented through policy. In addition, the board must examine and follow up to ensure that the firm is functioning in accordance with the organization's goals. As a result, the board of directors should be an important factor in enabling the development of organizational sustainability; nevertheless, a board of directors nominated by shareholders may have a different impact on the organization's sustainability. Many researchers, such as Zhang (2012) undertook a study based on the agency theory and found that gender diversity had a positive relationship with social responsibility. Huang (2013) found that a board comprising members who graduated in business or science was positively correlated to social responsibility. Giannarakis (2014) found that a company's social responsibility disclosure is related to the size of its board of directors. Similarly, Shamil et al. (2014) found that board size is positively associated with sustainability reporting. Post et al. (2015) studied the relationship between leaders and sustainability and found that the proportion of independent board members is related to sustainability in the dimension of corporate environmental responsibility. Kouaib et al. (2020) found that the board's role is critical to a company's sustainable perfoamnce since it promotes the interests of shareholders and stakeholders. A hypothesis was developed for this type of relationship, as follows:

H1: *The board of directors' characteristics have a positive effect on sustainability disclosure.*

3.2. The Board of Directors' Characteristics and Corporate Governance

Because business owners may lack basic management abilities, they must sign a contract appointing an agent to run the company instead of managing it themselves. To hire appropriate agents, business owners must determine specific qualifications and characteristics, such as the number of agents required, as well as required knowledge, capacity, experience, and special expertise, as it is necessary to ensure that agents can perform competently and generate capital and profit returns for the company. For public companies, the representative body that acts on behalf of the owners is the board of directors, which is responsible for overseeing the business according to the company goals, policy formulation, operation process, monitoring, and follow up operation to ensure that the company is transparent, honest, and accountable. The board of directors is part of a good corporate governance system and must establish a monitoring mechanism, and follow up on the implementation of the system. There are research studies that have found that the characteristics of the board of directors are important factors that influence the quality of corporate governance. The study by Crifo et al. (2019) showed that a high proportion of internal committees and social responsibility lead to higher-quality corporate governance practices. The Board of directors is responsible for disseminating information to investors in a timely and unbiased manner (Berglund, 2020). A hypothesis was developed for these types of relationships, as follows:

H2: *The board of directors' characteristics have a positive effect on corporate governance.*

3.3. Corporate Governance and Sustainability Disclosure

Sustainability management is a consideration for all stakeholders; it may involve formulating policies that have been developed under guidance from the board to represent the best interests of shareholders. To achieve sustainable development goals, companies must consider three aspects of sustainability, namely social, environmental, and economic aspects. The sustainability of an organization depends on a board of directors that has a diverse range of expertise to determine the direction of the organization to achieve sustainability and create value for shareholders and stakeholders. Shareholders should have confidence that, if the board of directors conducts business with good corporate governance, corporate sustainability will result. According to the principle of corporate governance, the board of directors must be responsible for the supervision and follow-up of business operations to maintain the rights and equitable treatment of shareholders, along with proper disclosure, transparency, and the carrying out of the responsibilities of the board of directors.

Stakeholders include customers, consumers, employees, partners, society, and those concerned with the noninfringement of the environment. There have been studies of the links between corporate governance and sustainability by some researchers, such as Tran et al. (2020) found that corporate governance, which consists of board size, foreign board members, and an audit committee, has a positive effect on corporate social responsibility disclosure. Jizi et al. (2014) studied banking groups and found that corporate governance was related to social responsibility.

This is consistent with the research of Salvioni et al. (2016), who found that social responsibility and sustainability require good corporate governance based on stakeholder engagement, fairness, transparency, and accountability. From the perspective of corporate outcomes, Hussain et al. (2018) studied the relationship between corporate governance and the sustainability of the organization, finding that corporate governance mechanisms were related to the performance of sustainable development. The hypotheses were developed for these types of relationships, as follows:

H3: *Corporate governance has a positive effect on sustainability disclosure.*

H4: *The board of directors' characteristics has a positive effect on sustainability disclosure through corporate governance*.

This review of literature connected to research on board of directors, sustainability, and corporate governance led to the development of the research framework is shown in Figure 1.

4. Research Methodology

4.1. Research Design

This study examines the influence of the board of directors' characteristics on firm sustainability (Figure 1). For every publicly listed company, the board of directors is appointed to oversee the management of the company on behalf of the shareholders; therefore, the subject targets of this study are the boards of listed companies on the SET. The information about the members of the board of directors is disclosed in the annual report of each company. Thus, the data collected for inferential statistical analysis came from secondary data in the annual reports, form 56-1, and from financial statements, which are disclosed on the website of SET.

4.2. Variables and Measurement

The variables in the study include the characteristics of the board of directors as independent variables, company sustainability as the dependent variable, and corporate governance as the mediator variable. The characteristics of the board of directors are measured by six items: proportion of women on the boards, ages of board members, education level, education field, board tenure, and board compensation. Corporate governance is measured by CG Score, and company sustainability is measured by the GRI standard disclosure. The variable name and measurement scale are shown in Table 1.

4.3. Research Sampling and Data Collection

The research samples are companies listed on the Thai Stock Exchange, which are all industry groups except financials, where all companies are subject to the rules of the Securities and Exchange Commission to disclose specific information in the annual report and form 56-1. The board of directors' characteristics are independent variables that were collected from these reports, whereas the CG rating score, which has four categories: excellent, very good, good, satisfactory, and other was collected from IOD in the year 2018. The GRI standard disclosure was used for the sustainability disclosure variables that were collected from the annual reports and sustainability reports from the SET website.

4.4. Data Preparation

After collecting data from the Stock Exchange of Thailand, the data was reviewed and prepared for the requirements of the statistical assumptions. The process began with an examination of normal distribution by checking the abnormal points (outliers). If the data was not normally distributed, they were omitted from the statistical model. Thereafter, the data was checked for normal distribution again until the data was approved.

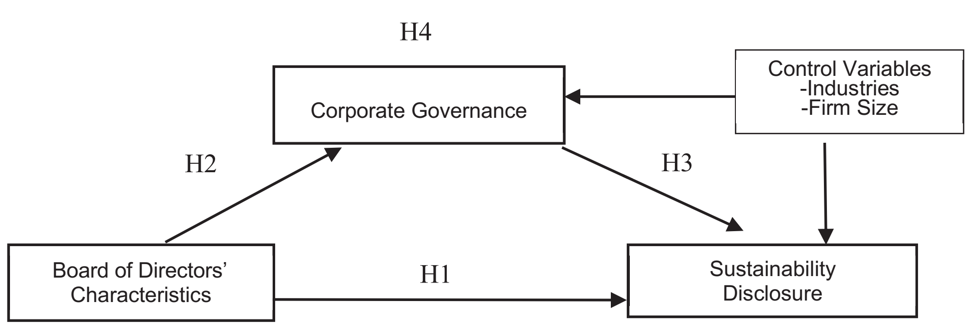

Figure 1: Research Framework

Table 1: Variables and Measurement Scale

Variable Name	Measurement Scale
The Proportion of Women on Boards	The number of women on the board of directors is divided by the total number of board members.
The Proportion of Board Members Are Over 50 Years	Sum of the board of directors ages over 50 divided by the total number of board members.
The Proportion of Boards Who Hold Postgraduate Degrees	The number of directors with masters or doctoral degrees is divided by the total number of board members.
The Proportion of Board Members from each Field of Education	Define the variable with a code of 1, if the education field of the board of directors is present, and 0 otherwise. Classify degree study into five study areas: 1) Business and related knowledge 2) Science 3) Accounting 4) Engineering 5) Other Measurement: the number of degrees held by all directors in each study area divided by the total number of board members.
Board Tenure	Average of directors' tenure.
Board Compensation	The Sum of the board of directors' compensation is divided by the total number of board members.
Corporate Governance Rating	Corporate governance ratings comprise 4 levels: 4 (excellent), 3 (very good), 2 (good), and 1(satisfactory and other).
Sustainability Disclosure GRI Standard	The study employed an 85-item GRI-standard form divided into three sections: 13 economic items on GRI201-206, 32 environmental items on GRI301-308, and 40 social items on GRI401-419. Data was gathered from the sustainability report (if applicable) and the company annual report. The disclosure score is a binary scale that takes the value 1 if an item is disclosed and 0 otherwise. The cumulative score of each dimension is then computed using the following formula: GRI = No. of items disclosed on indicators / Total item on an indicator.
Firm Size	Natural logarithm of the book value of year-end total assets.
Industries	Each dummy variable is defined to be 1 or 0 for each company that is part of the industry group of AGRO, CONSUMER, INDUSTRIAL, PROPCON, SERVICES, RESOURCES, and TECHNOLOGY.

4.5. Normality Testing

Data for each variable was evaluated for normal distribution using a QQ Plot, Box Plot, and Histogram. The QQ Plot for a normally distributed dataset should be present as an approximately diagonal line rising as the plot moves from left to right on the x-axis. A box plot is used to identify outliers that appear well above or below the box. In the histogram view, the graph presents approximately a symmetrical bell-shape; its skewness and kurtosis index are assessed by examining its skewness and kurtosis of Kline (2015), which states that a variable with an absolute skew-index value of greater than 3.0 is extremely skewed, while a kurtosis index greater than 8.0 is an extreme kurtosis. As a result of this process, some variables were dropped, while some others were transformed into dummy variables to resolve the data skew problem.

4.6. Multicollinearity Testing

Prior to testing each hypothesis, the multicollinearity problem of independent variables, which is one of the criteria of path analysis, must be tested to ensure that there is no multicollinearity problem in the independent variables. It was determined that the correlation coefficient is not greater than 0.7 (Joseph et al., 2010) through the use of the Pearson correlation testing method (Table 2).

4.7. Statistical Analysis and Hypothesis Testing

The statistical technique of descriptive statistics includes minimum, maximum, mean, and standard deviation. The path analysis statistical technique is used to test hypotheses and analyze the mediator role of corporate governance in the relationship between the characteristics of the board of directors and the sustainability of the company.

5. Empirical Results

5.1. Descriptive Statistics

The number and percentage of samples in each industry group that comprise the 460 listed companies of the SET are shown in alphabetical order in Tables 3 and 4. Given in descending order by percentage, they are Services (*N* = 108,23.48%), Industries (*N* = 95,20.65%), Property & Construction (*N* = 91,19.78%), Agro and Food Industries (*N* = 52,11.30%), Resources (*N* = 43,9.35%), Technology (*N* = 37,8.04%), and Consumer Products (*N* = 34,7.39%).

According to descriptive statistics, as shown in Table 3 and Table 4, the proportion of females appointed to the boards of Thai listed companies is lower than the male gender. Most of the board members are over 50 years old, have a postgraduate degree, and graduated in the business field. Furthermore, the average level of board experience is around 10 years, and it was found that companies in the resource industry pay the highest compensation. Finally, it was found that most of the companies have low GRI standards and the average CG score is a middle score.

5.2. Hypotheses Testing Results

For hypotheses testing, this research study used the path analysis, mentioned above (Figure 2 and Table 5), to test the regression weight between variables in the research model, and the results are shown in Table 6. Hypothesis1(H1) was accepted; AGEOVER50, ENGINEERINGFIELD, LogCOMPENSATION were found to have an effect on GRI.

Table 2: Pearson's Correlation Matrix Among Independent Variables

	1	2	3	4	5	6	7	8	9	10	11
1. WOMEN	1.00										
2. AGEOVER50	−0.13	1.00									
3. POSTGRADUATE	0.03	−0.03	1.00								
4. BUSINESSFIELD	0.05	−0.14	0.47	1.00							
5. SCIENCEFIELD	−0.01	0.03	−0.06	−0.13	1.00						
6. ACCOUNTINGFIELD	0.13	0.03	−0.04	−0.15	−0.10	1.00					
7. ENGINEERINGFIELD	−0.22	0.03	0.18	−0.11	−0.19	−0.11	1.00				
8. OTHERFIELD	0.02	0.07	0.16	−0.22	−0.08	−0.04	−0.13	1.00			
9. TENURE	−0.06	0.28	−0.29	−0.05	0.07	−0.03	−0.16	−0.17	1.00		
10. LogCOMPENSATION	−0.16	0.27	0.09	0.02	−0.06	0.01	0.01	0.05	−0.02	1.00	
11. CGSCORE	0.03	0.11	0.16	0.11	−0.03	0.01	0.10	−0.01	−0.09	0.33	1.00

Table 3: Descriptive Statistic of the Ratio of Board Graduate

Industries	*N*	Post Graduate	Business Field	Science Field	Accounting Field	Engineering Field	Other Field
Agro & Food Industry	52	0.59	0.53	0.08	0.15	0.12	0.17
Consumer Products	34	0.57	0.49	0.08	0.12	0.15	0.18
Industrials	95	0.58	0.53	0.08	0.11	0.22	0.17
Property & Construction	91	0.70	0.56	0.07	0.15	0.21	0.25
Resources	43	0.70	0.48	0.05	0.14	0.35	0.24
Services	108	0.63	0.53	0.15	0.12	0.15	0.21
Technology	37	0.65	0.50	0.09	0.14	0.25	0.19
Average	460	0.63	0.52	0.09	0.13	0.21	0.20

Table 4: Descriptive Statistic of the Raio of Board Gender, and Age and the average of Board Tenure and Compensation, CG Score, and GRI

Industries	*N*	Women	Age over 50	Tenure	Compensation	Cgscore	GRI
Agro & Food Industry	52	0.30	0.80	11.25	0.74	2.76	0.18
Consumer Products	34	0.35	0.81	12.38	0.51	2.58	0.17
Industrials	95	0.24	0.74	9.88	0.40	2.42	0.15
Property & Construction	91	0.25	0.78	9.13	0.66	2.73	0.17
Resources	43	0.27	0.82	6.45	0.92	2.74	0.21
Services	108	0.27	0.80	9.80	0.60	2.81	0.15
Technology	37	0.30	0.79	9.83	0.68	2.76	0.16
Average	460	0.28	0.79	9.82	0.64	2.69	0.17

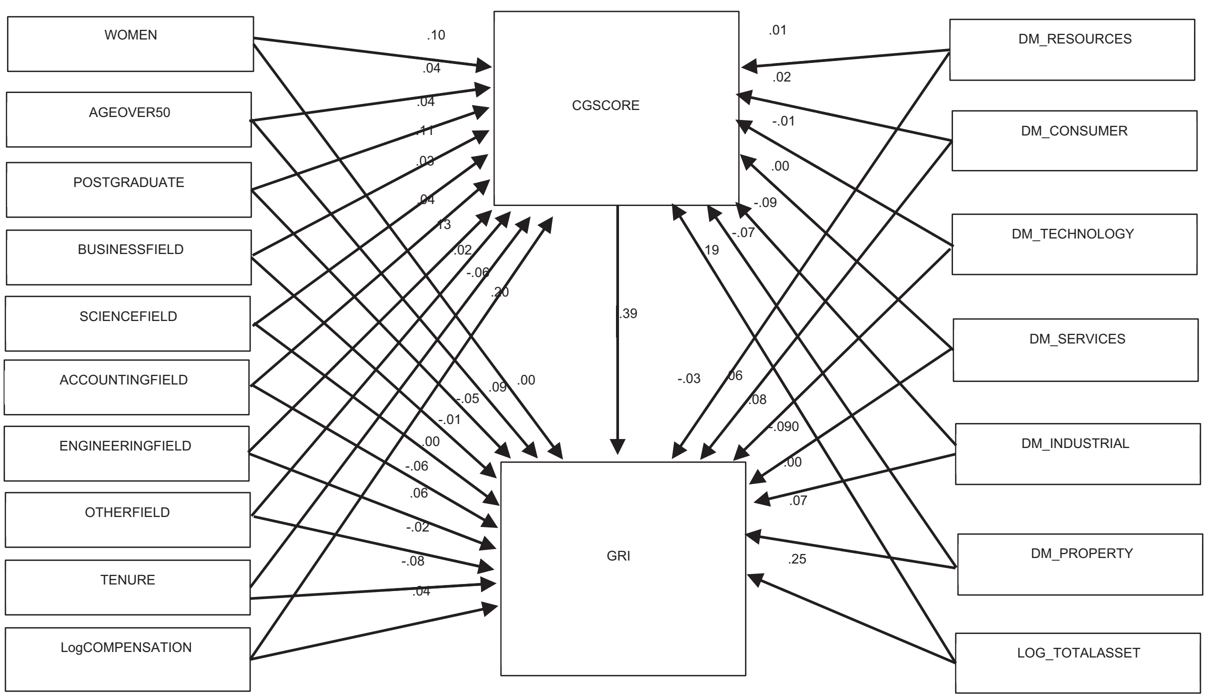

Figure 2: The Effect of Board of Directors' Characteristics on GRI through CGSCORE (MODEL3)

Table 5: Measurements of the Goodness of Fit

X^2	Degree of Freedom	X^2/Degree of Freedom	*p*-value	GFI	AGFI	RMR	RMSEA	NFI	CFI	Hoelter
134.310	72	1.865	0.000	0.971	0.923	0.033	0.043	0.930	0.964	351

Table 6: Standard Regression Weight of Board of Directors' Characteristics on CGSCORE and GRI

Variables	Model 1	Model 2	Model 3		
	CGSCORE	GRI	CGSCORE	GRI	GRI Through CGSCORE
WOMEN	0.100*	0.041	0.100*	0.003	0.039
AGEOVER50	0.043	0.109*	0.043	0.092*	0.017
POST GRADUATE	0.041	−0.037	0.041	−0.053	0.016
BUSINESS FIELD	0.108	0.033	0.108	−0.009	0.042
SCIENCE FIELD	0.030	0.012	0.030	0.001	0.012
ACCOUNTING FIELD	0.040	−0.041	0.040	−0.057	0.016
ENGINEERING FIELD	0.129*	0.115*	0.129*	0.064	0.050
OTHER FIELD	−0.018	−0.028	−0.018	−0.021	−0.007
TENURE	−0.063	−0.107*	−0.063	−0.083	−0.025
LogCOMPENSATION	0.197***	0.116*	0.197***	0.039	0.077
CGSCORE				0.389***	

*p-value < 0.05 , ***p-value < 0.001.
Model 1: The effect of the board of directors' characteristics on CG score, without GRI.
Model 2: The effect of the board of directors' characteristics on GRI, without CG.
Model 3: The effect of the board of directors' characteristics on GRI through CG score.

Hypothesis2(H2) was also accepted; WOMEN, ENGINEERINGFIELD, and LogCOMPENSATION were found to have an effect on CGSCORE. In addition, Hypothesis 3(H3) was accepted; CGSCORE was found to have an effect on GRI. For mediator testing, there was one mediator found between the board of directors' characteristics and GRI on CGSCORE, because ENGINEERINGFIELD had an effect on both GRI and CGSCORE. Hypothesis4(H4) was accepted; there is an indirect effect of the board of directors' characteristics on GRI through CGSCORE. In addition, ENGINEERINGFIELD was found to be a full mediator because, after testing a regression with GRI as a dependent variable and post-testing by adding CGSCORE as the mediator, the regression weights of ENGINEERINGFIELD decreased to nonsignificant values. To calculate the percentage of mediator, the effect of ENGINEERINGFIELD on GRI through CGSCORE was $0.050 / 0.115 \times 100 = 43.47\%$.

The results confirm the research of Ullah et al. (2019), who found that the presence of women on the board resulted in corporate social responsibility disclosures. The research of Hassan et al. (2016) found a positive effect between the presence of women on the boards and market performance, which could improve the internal operation of the company. However, Herli et al. (2021) discovered that the presence of female directors on corporate boards has no effect on a large company's corporate social responsibility.

A senior board of directors with prior management experience, knowledge of managerial valuable resources, and a sense of responsibility may have a positive impact on good governance and sustainability. This is consistent with the findings of Ouma and Webi (2017), who investigated age diversity on corporate boards of directors and discovered that it had a positive impact on social outcomes. Beji et al. (2020) discovered a link between better corporate governance and age diversity on the board of directors in their study.

Sustainability is influenced by boards of directors who have a background in engineering because those subjects are associated with creative thinking, planning, and systematic analysis of work. There is no prior research to confirm a link between an engineering education background and sustainability disclosure; however, a study by Zaidi et al. (2021) found a link between board member education in engineering and firm performance, and Garcia-Blandon et al. (2019) also found that CEOs with engineering degrees have significantly higher ESG performance.

Findings on the effectiveness of corporate governance are consistent with the research of Salvioni et al. (2016), who found that social responsibility and sustainability must be based on corporate governance, and the research of Jizi et al. (2014) who studied banking companies and found that corporate governance carried out in accordance with principles of social responsibility is one of the factors in company sustainability.

With respect to the compensation factor, the previous studies of Yahya and Ghazali (2017) showed that CEO compensation had a significant effect on the organization in terms of operating and market performance, and Buachoom (2017) also found that the compensation level was the driving force for improving company performance. Thus, it can be concluded that compensation also has an impact on corporate sustainability.

6. Conclusion

This research aimed to study the influence of board of directors' characteristics on sustainability disclosure, with the assumption that sustainability disclosure is a product of a good corporate governance concept. The results of the hypotheses testing were as follows: 1) Board of directors who are over 50 years old, who graduated in the engineering field, and boards' compensation have a positive effect on sustainability disclosure. 2) Board of directors who graduated with degrees in engineering fields, those who receive high compensation, and those that include female directors have a positive effect on corporate governance. 3) Corporate governance has a positive effect on sustainability disclosure. 4) Board of directors who graduated in the engineering field have a positive effect on sustainability disclosure through corporate governance.

According to the mediator role of corporate governance, board members who have a background in engineering assist the organization in achieving good corporate governance results, and these results have a direct impact on sustainability disclosure because engineering studies generally reinforce creative thinking, systematic analysis, and skilled technical planning. Engineers also have the ability to create useful innovations that can bring value to the organization, and they are committed to environmental conservation, making constant improvement, and reducing the organization's energy usage.

References

Beji, R., Yousfi, O., Loukil, N., & Omri, A. (2020). Board diversity and corporate social responsibility: Empirical evidence from France. *Journal of business ethics, 2*(5), 1–23. https://doi.org/10.1007/s10551-020-04522-4

Berglund, T. (2020). Liquidity and corporate governance. *Journal of Risk and Financial Management, 13*(3), 54. https://doi.org/10.3390/jrfm13030054

Buachoom, W. (2017). Simultaneous relationship between performance and executive compensation of Thai non-financial firms. *Asian Review of Accounting, 25*(3), 404-423. https://doi.org/10.1108/ARA-02-2016-002010.1080/23311975.2017.1398124

Crifo, P., Escrig-Olmedo, E., & Mottis, N. (2019). Corporate governance as a key driver of corporate sustainability in France: The role of board members and investor relations. *Journal of Business Ethics, 159*(4), 1127–1146. https://doi.org/10.1007%2Fs10551-018-3866-6

Danoshana, S., & Ravivathani, T. (2019). The impact of the corporate governance on firm performance: A study on financial institutions in Sri Lanka. *SAARJ Journal on Banking & Insurance Research, 8*(1), 62–67. https://meritresearchjournals.org/aaef/Content/2013/December/Danoshana%20and%20Ravivathani.pdf

Garcia-Blandon, J., Argilés-Bosch, J. M., & Ravenda, D. (2019). Exploring the relationship between CEO characteristics and performance. *Journal of Business Economics and Management, 20*(6), 1064–1082. https://doi.org/10.3846/jbem.2019.10447

Giannarakis, G. (2014). The determinants influencing the extent of CSR disclosure. *International Journal of Law and Management, 56*(5), 393–416. https://doi.org/10.1108/IJLMA-05-2013-0021

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review, 9*(2), 193–206. https://doi.org/10.2307/258434

Hassan, R., Marimuthu, M., & Kaur Johl, S. (2016). Women on boards and market performance: An exploratory study on the listed companies. *International Business Management, 10*(2), 84–91. https://doi.org/10.36478/ibm.2016.84.91

Herli, M., Tjahjadi, B., & Hafidhah, H. (2021). Gender diversity on board of directors and intellectual capital disclosure in Indonesia. *The Journal of Asian Finance, Economics, and Business, 8*(1), 135–144. https://doi.org/10.13106/jafeb.2021.vol8.no1.135

Huang, S. K. (2013). The impact of CEO characteristics on corporate sustainable development. *Corporate Social Responsibility and Environmental Management, 20*(4), 234–244. https://doi.org/10.1002/csr.1295

Hussain, N., Rigoni, U., & Orij, R. P. (2018). Corporate governance and sustainability performance: Analysis of triple bottom line performance. *Journal of Business Ethics, 149*(2), 411–432. https://doi.org/10.1007%2Fs10551-016-3099-5

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics, 3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Jizi, M. I., Salama, A., Dixon, R., & Stratling, R. (2014). Corporate governance and corporate social responsibility disclosure: Evidence from the US banking sector. *Journal of Business Ethics, 125*(4), 601–615. https://doi.org/10.1007/s10551-013-1929-2

Joseph, F., Barry, J. B., Rolph, E. A., & Rolph, E. A. (2010). *Multivariate data analysis*. London, UK: Pearson Prentice Hall.

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. USA: Guilford Publications.

Kouaib, A., Mhiri, S., & Jarboui, A. (2020). Board of directors' effectiveness and sustainable performance: The triple bottom line. *The Journal of High Technology Management Research, 31*(2), 100390. https://doi.org/10.1016/j.hitech.2020.100390

Loh, L., Thomas, T., Lee, S., Lim, L., Pan, H., Malek, M., & Wynne, R. (2018). *Sustainability reporting in ASEAN countries.* https://www.asean-csr-network.org/c/images/Resources/Reports/2018_Sustainability_Reporting_in_ASEAN_Countries.pdf

McFarland, D. E. (1979). *Management: Foundations and practices*. New York: Macmillan Publishing Company.

Ouma, C. A., & Webi, R. Y. (2017). Effect of age diversity of board members on the performance of non-governmental organizations in Kenya. *International Journal of Novel Research in Marketing Management and Economics, 4*(2), 101–123. http://erepo.usiu.ac.ke/bitstream/handle/11732/3376

Panda, B., & Leepsa, N. (2017). Agency theory: Review of theory and evidence on problems and perspectives. *Indian Journal of Corporate Governance, 10*(1), 74–95. https://doi.org/10.1177/0974686217701467

Post, C., Rahman, N., & McQuillen, C. (2015). From board composition to corporate environmental performance through sustainability-themed alliances. *Journal of Business Ethics, 130*(2), 423–435. https://www.jstor.org/stable/24703477

Rose, C. (2016). Firm performance and compliance or explain disclosure in corporate governance. *European Management Journal, 34*(3), 202–222. https://doi.org/10.1016/j.emj.2016.03.003

Salvioni, D. M., Franzoni, S., & Gennari, F. (2016). Corporate governance systems and sustainability: CSR as a factor of convergence between outsider and insider systems. *Corporate Ownership and Control, 14*(1), 139–150. https://doi.org/10.1504/IJBPM.2018.088490

Setyahadi, R. R., & Narsa, I. (2020). Corporate Governance and Sustainability in Indonesia. *The Journal of Asian Finance, Economics, and Business, 7*(12), 885–894. https://doi.org/10.13106/jafeb.2020.vol7.no12.885

Shamil, M. M., Shaikh, J. M., Ho, P.-L., & Krishnan, A. (2014). The influence of board characteristics on sustainability reporting: empirical evidence from Sri Lankan firms. *Asian Review of Accounting, 22*(2), 78–97. https://doi.org/10.1108/ARA-09-2013-0060

Tran, Q. T., Lam, T. T., & Luu, C. D. (2020). Effect of corporate governance on corporate social responsibility disclosure: empirical evidence from Vietnamese commercial banks. *The Journal of Asian Finance, Economics, and Business, 7*(11), 327–333. https://doi.org/10.13106/jafeb.2020.vol7.no11.327

Tulung, J. E., & Ramdani, D. (2016). The influence of top management team characteristics on BPD performance. *International Research Journal of Business Studies, 8*(3), 155–166. https://doi.org/10.21632/irjbs.8.3.155-166

Ullah, M. S., Muttakin, M. B., & Khan, A. (2019). Corporate governance and corporate social responsibility disclosures in insurance companies. *International Journal of Accounting & Information Management, 27*(2), 284–300. https://doi.org/10.1108/IJAIM-10-2017-0120

Yahya, F., & Ghazali, Z. B. (2017). Effectiveness of board governance and dividend policy as alignment mechanisms to firm performance and CEO compensation. *Cogent Business & Management, 4*(1), 1–20. https://doi.org/10.1080/23311975.2017.1398124

Zaidi, N., Azouzi, M. A., & Sadraoui, T. (2021). CEO financial edcuation and bank performance. *Journal of Entrepreneurship Education, 24*(2), 1–20. https://www.abacademies.org/abstract/ceo-financial-education-and-bank-performance-10221.html

Zhang, L. (2012). Board demographic diversity, independence, and corporate social performance. *Corporate Governance: The International Journal of Business in Society, 12*(5), 686–700. https://doi.org/10.1108/14720701211275604