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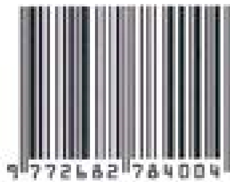

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DOES BOARD SIZE MODERATE THE RELATIONSHIP BETWEEN SUSTAINABILITY REPORTING AND FIRM PERFORMANCE?

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ABSTRACT

The study aims to determine the moderating effect of board size on the relationship between sustainability reporting and corporate performance. The 200 largest Malaysian firms, based on market capitalization (2021), are examined for the period from 2012 to 2021. The study uses a pooled Ordinary Least Square (OLS), random, and fixed effects analysis. The results show that board size does not affect the relationship between sustainability reporting and firm performance. Moreover, the result is robust even after weakening the serial correlation and heteroskedasticity problem. The result suggests that board size plays a less significant role in influencing sustainability reporting and firm performance. Despite the less significant influence, board size should not be neglected as this variable is one of the most important determinants of corporate performance and should be further investigated in different contexts and variables.

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1. Introduction

The growing concerns towards sustainability, make sustainability reporting more well known especially in the past decade. (Kuzey and Uyar 2017). Sustainability reporting means publishing about the company's operations or activities, specifically its governance, environment, and impacts on society. Besides the growing concerns at the firm level, the concern can be discovered at the macro or global level perspective. For example, the shared blueprint by the United Nations in protecting the peace and prosperity of the people and the planet through the introduction of sustainable development goals (SDG). Regardless of firm or global level concern, the main objective of this blueprint or this reporting is to help mitigate the rising concerns on global warming, carbon emissions, challenges with workplace health and safety, and others are

only a few of these problems (Frias-Aceituno et al. 2014; Nuskiya et al. 2021; Orazalin and Mahmood 2019). Organizations are held accountable for the economic, social, and environmental issues in our community because it has an impact on achieving sustainable development goals through their activities and networks (Farisyi et al., 2022). To mitigate these problems and communicate with their stakeholders about sustainability-related efforts, organizations are under increasing pressure (Bose et al. 2018, Orazalin and Mahmood 2019). They needed to be aware of how the businesses' actions affected them and their surroundings.

In addition, the increased concerns and regulations make the nowadays firm company's primary objective not only focusing on profit maximization alone but rather the overall wealth of the stakeholder should be to benefit all of its stakeholders, including customers, employees, society, and the environment. Firms are required to maintain positive relationships with their stakeholders, especially when it comes to the availability of resources to perform operational tasks. Therefore, the company must disclose information about its operations not only in its financial report, but also in its non-financial performance such as overall indicators, sustainability performance (also known as the triple bottom line), and sustainability in terms of economic, social, and environmental performance.

Moreover, the company pursuing sustainable environmental development can use the sustainability report as a benchmark. The sustainability report is provided in two different formats, either as a stand-alone report or as part of the annual report. One tool the company uses to connect with outsiders is an annual report. According to the Star (2022), the CEO of Bursa Malaysia Securities Berhad posited that the listing requirements for the main market (main LR) and the ACE market listing requirements (ACE LR) for sustainability reporting requirements need to be expanded to improve the sustainability practices and disclosure of listed companies.

The Sustainability Reporting Guide (SRG) was published as a comprehensive reference. It adheres to the founding premise of the GRI (Global Reporting Initiative), which includes reporting on economic, environmental, and social performance (Ioannou & Serafeim, 2016). From Figure 1, we can see that for 58 countries 5800 companies (N100), 79% of them reported sustainability-related data (KPMG 2022). The results of the survey show that 96% of the 250 largest companies in the world (the G250) report on sustainability.

In Malaysia, sustainability reporting has been mandatory since 2016, although it was practiced there long before 2016. Growing concerns about the way companies do business and the great importance they place on economic, environmental, and social (EES) impacts have led to sustainability reporting becoming mandatory. Sustainability reporting in Malaysia was developed to provide a guide for integrating sustainability into business operations to help companies assess and manage their EES with the opportunities and risks present (Bursa Malaysia, 2015). The introduction of sustainability reporting in Malaysia raises the question of how effective this reporting is in leading a company towards sustainability, which can be reflected in a firm's performance. Therefore, we are motivated to understand this relationship in the Malaysian context as sustainability reporting has become mandatory for Malaysian firms. Moreover, previous empirical studies in different countries have shown contradictory results on this relationship. The inconsistent findings suggest the potential moderating factors may influence the sustainability reporting and firm performance relationship. We specifically, suggested that board size may influence this relationship. For example, Said et al. (2009) discovered a very tenuous connection between board size and sustainability reporting. Htay et al. (2012) also indicated that the size of the board composition has a negative correlation with the level of sustainability reporting. However, Esa and Ghazali (2012) revealed positive correlation between board size and corporate sustainability disclosure. Based on this discovery, we posited that the firm's board of

director may motivated to publish their sustainability reporting to the public if it has the potential to enhance firm performance.

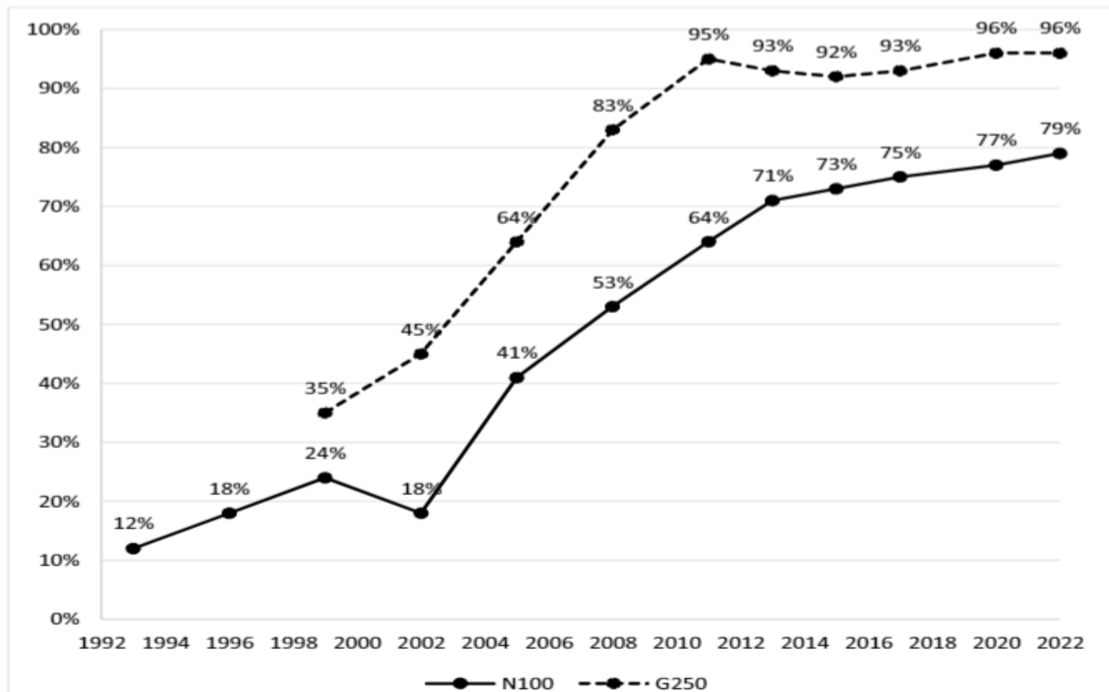

Figure 1. Global sustainability reporting rates (1993–2022). (Source: KPMG Survey of Sustainability Reporting 2022)

Besides, this study makes several important contributions. It is the first study to empirically examine the relationship between board size as a moderator on sustainability reporting in Malaysia for both sensitive and non-sensitive industries, adding to the body of knowledge on the relationship between corporate governance and sustainability reporting in developing countries, as the most studies are from the developed countries (Adam et al., 1998; De Villiers and Van Staden, 2010; Wilmshurst and Frost, 2000). Therefore, there will be many firms will try to publish their company's sustainability report in Malaysia. The board of the directors considered the one of the important people and a component of the corporate governance structure that can influence the company's decision to disclose more or less of its sustainability reporting to society. Therefore, this study contributes to the body of knowledge in this field by identifying whether the governance processes are related to an increase in sustainability reporting in annual reports. This study aims to investigate the moderating effects of board size on the relationship between sustainability reporting and corporate performance.

2. Literature Review

2.1 Sustainability Reporting and Firm Performance

The sustainability report is crucial for a company as it informs the public about the company's economic, social, and environmental performance. To satisfy the various economic, environmental, and social needs of their stakeholders and gain the legality necessary for their success, companies have been forced to consider both their financial and non-financial performance (Barrena Martnez et al. 2016; Freeman, 1994). This means that this report serves as a basis for other parties to assess the company's performance. According to Rikhardsson and Holm (2008), a company's sustainability report is an important factor in the decisions of stakeholders, investors, creditors, suppliers, communities, governments, and other parties related to the company. Therefore, the factors we focus on in this study are the size of the board of directors, which can moderate the influence on the relationship between sustainability reporting and firm performance.

For this reason, recent research has examined the impact of sustainability reporting on firm performance. Buys et al. (2011) found that companies that voluntarily published their sustainability report were financially better off than those that did not. Hussain (2015) studied the relationship between the financial performance of 100 companies and sustainability reporting. The results show that a company's performance is significantly improved by the social and environmental aspects of sustainability. Besides, Khan (2019) used the content analysis approach for data collection and investigated the effects of corporate sustainability practices on the financial performance of firms in Pakistan's banking industry. The study revealed that increased sustainability reporting is associated with improved financial performance of Pakistani banks therefore sustainability reporting has a beneficial influence on firm performance.

In addition, Abd Rahman et al. (2013) investigated the relationship between firm performance and sustainability environmental reporting in Malaysia. Using content analysis, a study was conducted on environmental practices, and it was found that 68% of Malaysian companies dedicated certain sections to environmental practices in their annual reports. It was found that transparency in environmental reporting and corporate performance in Malaysia are positively related. However, there is not much research on the relationship between firm performance and sustainability reporting in Malaysia. In contrast, Kasbun et al. (2016) found that there is little evidence to support the claim that companies that provide sustainability reports perform better than those that do not. They explained that this is due to inadequate reporting and a lack of research in Malaysia.

Furthermore, content analysis was used in the study by Ortas et al. (2014) to assess sustainability reporting in 59 countries using the GRI framework. They investigated the links between the company’s financial operations and sustainability reporting. According to the results, there is a strong link between active sustainability reporting disclosure and a company’s performance. By analyzing market reactions to the first stand-alone sustainability reports published by a sample of 59 United States companies between 2001 and 2007, Brown et al. (2009) show that the highest level of sustainability reporting improves corporate reputation. Similar results from subsequent studies are described by Guidry and Patten (2010).

2.2 Sustainability Reporting, Board Size, and Firm Performance

Board size refers to the total number of board members (Kalsie et al., 2016), which plays a significant role in monitoring the board's performance. A board of directors which chosen to monitor the actions of managers to reduce agency costs and problems (Aguilera and Jackson,

2003), which increases the quality of disclosure. A larger board has more directors who strive to monitor and oversee stakeholder interests, improving the efficiency of the organization. For example, agency costs may decrease with a larger board size because a large board consists of more directors who strive to monitor and regulate managerial performance (Hillman & Dalziel, 2003). There are arguments for and against larger boards in the literature to improve firm performance and transparency. Proponents of smaller boards believe that they increase firm value and are more likely to operate more efficiently. (Lakhal, 2005).

Companies with several boards are better equipped to monitor disclosure activities, making their presence more acceptable to stakeholders and enhancing their performance (Hu & Loh, 2018; Birindelli et al., 2018). Board size can considerably and favorably affect sustainability reporting, according to prior studies. (Hu & Loh, 2018; Wang, 2017). For example, Mudiyanselage (2018) used a sample of 100 listed Sri Lankan companies to examine the role of directors in corporate sustainability from 2012 to 2016 and found a favorable connection. However, the sample utilized by Halau and Bin-Nashwan (2021) contained every company registered on the Nigerian Stock Exchange (2018). The results show a strong and negative correlation between board size and sustainability reporting from 2015 to 2019.

In the theoretical framework of corporate governance, agency theory is the best-known and accepted theoretical position in previous research on the role of boards of directors. It supports the relationship between board size and firm performance (Muth et al., 1998). Agency theory has several important ramifications, one of which is that shareholders lose effective control over large companies as they grow larger (Muth et al 998). According to agency theory, the board of directors serves as a unified voice for all stakeholders and shareholders of the company when it comes to the performance and decisions of managers. For instance, agency theory implies that board size has a positive impact on the firm performance (Kalsie & Shrivastav, 2016). The findings of Boone et al. (2007) support this by showing a positive correlation between board size and indicators of insider benefit availability. Thus, agency theory predicts that a larger board can improve the firm's performance because it is overseen by a larger number of people.

According to agency theory, we predict that the number of board members and sustainability reporting should be positively correlated in Malaysia. Based on past theoretical arguments and empirical research, we propose the following objectives:

Hypothesis 1: Board size moderates the relationship between sustainability reporting and firm performance.

3. Methodology

3.1 Sample Selection

The methodology of this study is to examine the moderating effect of board size on the relationship between sustainability reporting and corporate performance in Malaysia from 2012 to 2021, a period of 10 years. Examining 10 years with the latest data also can assess whether sustainability efforts lead to sustainable long-term corporate performance improvements or if there are lag effects. The 200 largest Malaysian companies by market capitalization in 2021 were used for the study, which excluded the banking institutions and financial services. All data for this study was obtained from Bursa Malaysia and DataStream. The primary justification for choosing the research period is that companies with higher market capitalization often play a significant role in the national economy. They typically represent a substantial portion of the total market

value of all listed companies. Therefore, studying these top companies can provide insights into the overall economic impact of sustainability reporting and corporate performance.

3.2. Variable Definitions

3.2.1 Dependent Variable

The dependent variable used in this study is used to proxy firm performance. The study chooses ROE as a proxy for firm performance which has also been used in past studies (Marimuthu and Kolandaisamy,2009).

3.2.2 Independent Variable

The independent variable used in this study is a dummy variable similar to Sobhani et al. (2012). It uses the dummy variables with a value of 1 if the company published its sustainability reporting between 2012 and 2021, and a value of 0 if it did not.

3.2.3 Moderator Variable

The moderating variable in the study is the use of board size to calculate the number of board members for each of the 200 largest Malaysian companies based on a company's market capitalization in 2021.

3.2.4 Control Variable

The study includes some control variables, including Bursa Malaysia's firm size and leverage, and DataStream's historical beta. The control variables used in this study have been used in several studies (Noordin et al.,2017; Jiang et al., 2017). These control variables could affect the relationship between board size, sustainability reporting, and firm performance.

Table 1 provides the definition, sources, measurement, and references for each variable used in the empirical analysis.

Table 1
Measurement of Variables

Variables	Measurement	Sources	References
Dependent Variable:			
Return of Equity (ROE)	The company's net income divided by the value of its total shareholders' equity	DataStream	Marimuthu and Kolandaisamy (2009)
Independent Variable:			
Sustainability Reporting	Dummy variables. "1" is for the company that published sustainability reporting whereas "0" is otherwise.	Annual Report/ Bursa Malaysia	Sobhani et al. (2012)
Moderator Variable:			
Board Size	The number of directors on the board	Annual Report	Lawal (2011)
Control Variables:			
Firm Size	The natural logarithm of the firm's total	Bursa Malaysia	Noordin et al.

((Log(size))	assets	/ DataStream	(2017)
Leverage	Total debt/Total assets	Bursa Malaysia / DataStream	Jiang et al. (2017)
Historical Beta	Dividing the security's standard deviation of returns by the benchmark's standard deviation of returns.	DataStream	Jiang et al. (2017)

3.3 Analytical strategy

Pooled Ordinary Least Square, Random, and Fixed Effects analyzes are used in the study to analyze the data. To control for potential unobserved heterogeneities at the firm level, the study follows Ntim and Osei (2011) and Ntim and Soobaroyen (2013) use three-panel data techniques, including simple pooled ordinary least squares (OLS), fixed effects models, and random effects models. Breusch-Pagan and Hausman's tests are used to determine which is the most appropriate model. Before the primary analysis, several diagnostic tests are performed to identify issues such as multicollinearity, heteroscedasticity, and serial correlation. To analyze the data, the following equation was used in the study:

Model Specification:

$$ROE_{i,t} = a_{i,t} + \beta 1 Sustainability\ reporting_{i,t} + \beta 2 Board\ Size_{i,t} + \beta 3 Sustainability\ Reporting * Board\ Size_{i,t} + \beta 4 Firm\ size_{i,t} + \beta 5 Leverage_{i,t} + \beta 6 Historical\ beta_{i,t} + Year_{i,t} + Industry_{i,t} + \varepsilon_{i,t}$$

Where:

$ROE_{i,t}$ = Firm Performance

β1-β10= Regression Coefficient

$\varepsilon_{i,t}$= Error term

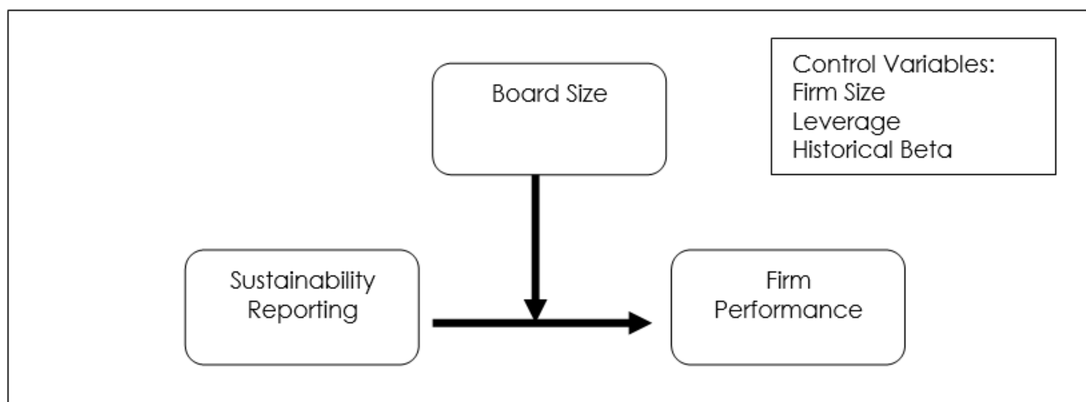

Figure 2. Research Framework Agency Theory

4. Results

4.1 Descriptive statistics

Table 2
Descriptive statistics + VIF Analysis

Variable	*Obs*	*Mean*	*Standard deviation*	*Min*	*Max*	*VIF*
Sustainability Reporting	1875	0.76	0.43	0	1	1.02
ROE	1888	11.88	20.09	-30.64	121.4	N/A
Board size	1875	8.33	2.16	5	14	1.22
Firm size	1928	14.17	1.70	10.62	18.12	1.56
Leverage	1923	0.22	0.17	0	0.62	1.28
Historical beta	1867	0.99	0.70	-0.44	3.04	1.04

***N/A:** Not Available

Table 2 provides descriptive statistics for the variables tested in this study. From this table, the firm size has the highest mean value of the variables with a value of 14.17, while leverage has the lowest mean value of 0.22. Leverage has the lowest standard deviation with a value of 0.17, but ROE has the highest standard deviation with 20.09.

Moreover, we can see the lowest and highest values of each variable according to Table 2. An additional test for multicollinearity is also included in Table 2 in the form of a variation inflation factor (VIF) analysis. Any VIF count greater than four should be considered indicative of multicollinearity (Hair et al., 2010). From this section, there are no variables that exceed the value of the four reported. The highest value for VIF, which represents company size, is 1.56, while the lowest value for sustainability reporting is 1.02. So, the problem of multicollinearity does not exist in the study.

To assess the reliability of our test for multicollinearity, we additionally evaluate it using the Pearson correlation matrix. According to Hair et al. (2010), any correlation value greater than 0.60 is considered to indicate multicollinearity. As shown in Table 3, no value presented in this table exceeds the value of 0.60.

4.2 Pearson Correlation Matrix

Table 3
Pearson Correlation Matrix

	ROE	*Sustainability Reporting*	*Board Size*	*Log (size)*	*Leverage*	*Historical Beta*
ROE	*1*					
Sustainability reporting	*0.0603**	*1*				
Board size	*-0.0024*	*0.0653**	*1*			

Log (size)	*-0.0011*	*0.1281**	*0.4172**	*1*		
Leverage	*-0.0841**	*0.0125*	*0.1285**	*0.4549**	*1*	
Historical Beta	*-0.1350**	*-0.0006*	*-0.0314*	*0.1402**	*0.1241**	*1*

Denotes significance at the 10% level.
***** Denote significance at the 5% level.***
****** Denote significance at the 1% level.***

To ensure that the results were robust, numerous diagnostic tests were performed in the study. Multicollinearity is evident in Tables 2 and 3, and we also test for heteroskedasticity and serial correlation. To detect heteroscedasticity, we used the Breusch-Pagan heteroscedasticity test. To address these issues, consistent with Ofori-Sasu et al. (2017), we used a robust standard error to reduce the problem of heteroskedasticity and serial correlation throughout the analysis. The results of this analysis are presented in Table 4.

4.3 Result

Table 4
Main Result

	Model 1: Pooled Ordinary Least Square (RSE)		***Model 2: Random Effect (RSE)***		***Model 3: Fixed Effect (RSE)***	
Regression	***Coefficient***	***T-value***	***Coefficient***	***Z-value***	***Coefficient***	***T-value***
Constant	*-9.820934*	*-1.59*	*-30.70178*	*-2.27***	*-50.99613*	*-2.43***
Sustainability Reporting	*12.5953*	*3.24****	*5.809619*	*1.75**	*4.302973*	*1.26*
Board size	*0.329498*	*0.80*	*0.5437811*	*1.42*	*0.544569*	*1.38*
Boardsize*sustainability reporting	*-1.328774*	*-2.93****	*-0.7311461*	*-1.91**	*-0.6214372*	*-1.61*
Firm size	*1.177213*	*3.29****	*3.03355*	*2.98****	*4.477346*	*2.87****
Leverage	*-12.8661*	*-4.50****	*-27.22541*	*-5.33****	*-28.99453*	*-5.07****
Historical beta	*-2.35502*	*-3.48****	*0.9155193*	*1.03*	*1.323404*	*1.39*
With Industry and Year	*Yes*		*No*		*No*	
Breush Pagan	*4312.27(0.0000)*				*-*	
Hausman test	*-*		*41.18(0.0000)*			

RSE: Robust Standard Error
Denotes significance at the 10% level.
***** Denote significance at the 5% level.***
****** Denote significance at the 1% level***

The moderating effect of board size on the relationship between sustainability reporting and firm performance is examined in the study using three analyses: pooled ordinary least squares (OLS), random effects analysis, and fixed effects analysis. To reduce the possibility of heteroskedasticity

and autocorrelation, the full analysis is conducted using a robust standard error calculation. The study also included industry and year in the OLS analysis.

Table 4 shows that the interaction term between board size and sustainability reporting is significant but has a negative moderating effect on sustainability reporting and company performance with a t-value of -2.93. All other control variables in Model 1, leverage, historical beta, and log (total assets), have a significant effect on firm value and firm performance. OLS is also used in Model 1 which includes year and industry dummy.

In addition, Model 2, which is a random effect, shows that the interaction terms between board size and sustainability reporting also had an insignificant negative impact, but are only marginally significant between corporate performance and sustainability reporting, with a z-value of -1.91 (0.10 significant level). The control variables included here are strongly significant for company size and leverage, but not significant for historical beta with a z-value of 1.03. A negative moderating effect between sustainability reporting and company performance is also evidenced by the interaction term in Model 3 between board size and sustainability reporting with a t-value of -1.61. Except the historical beta, every control variable in Model 3 related to corporate performance is strongly significant. The appropriate estimate for the analysis in this study is shown in Table 4. The fixed effect is the most appropriate choice for data analysis, as shown by the repeated test result where the chi-square value is significant at 5% probability level.

5. Conclusion

There is still little data that convincingly demonstrates that companies that disclose or report on economic, social, and environmental sustainability perform better financially than companies that do not. This may be a result of inadequate reporting in Malaysia. Due to inadequate implementation and inconsistent sustainability reporting. Sustainability reporting in Malaysia may also demonstrate inconsistent discovery as compared to other developed countries.

It is not difficult for companies to improve their sustainability performance and disclose it to the public. This is because Malaysia is a developing country that has seen outstanding economic growth in recent decades with less government intervention than other Asian countries. It is encouraging to observe that the value of sustainability reporting and reports published in Malaysia has increased in recent years. Providing stakeholders with key sustainability reports that reflect past performance and provide a glimpse into the future in terms of economic, environmental, and social performance is often used by companies to make strategic and tactical decisions, such as improving operations and identifying new markets for risk purposes.

This study makes several contributions, first, this study has shed light on how reporting on economic, social, and environmental sustainability reporting may require further improvement to enable it to help firms enhance their performance. As suggested by the original reasons for sustainability reporting establishment, the reporting should provide a clear guide to a firm to achieve sustainability, especially in today's dynamic business, economic, and societal environment and one of the first steps towards that is to enhance firm performance. Based on our discovery, the reporting seems unable to achieve it and thus further improvement and attention by regulators and practitioners is needed. Additionally, our tested moderator variable (board size) demonstrates a less critical role in this relationship.

Like other empirical research, the study comes with limitations, one of the limitations of this study is sample size is limited to the 200 largest companies by market capitalization in 2021, and the 200 largest Malaysian companies need to exclude banking institutions and financial services from the

list. Therefore, the results need to be extended to more samples to potentially reduce survivorship bias results. In addition, there are certain problems with the lack of secondary data (on sustainability reporting) from Bursa Malaysia and Data Streams. As a result, the results may not truly reflect the sample of Malaysian companies reporting on sustainability reporting.)

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Conflict of Interest

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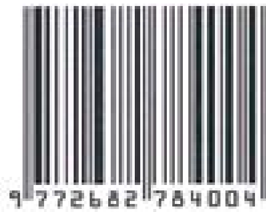

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