CSR PERFORMANCE, FIRM'S ATTRIBUTES, AND SUSTAINABILITY REPORTING

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ABSTRACT

This study aims to empirically identify the drivers of sustainability reporting (SR) in Indonesia. Relying on the legitimacy theory, we conjecture that CSR performance and the firm's attributes are associated with SR. Using the sample from the Indonesian Capital Market (IDX), we run logit regression analysis. Logit regression is performed by employing quarterly data from 37 publicly listed companies, that voluntarily published sustainability reports from the first quarter (Q1) of 2012 to the last quarter (Q4) of 2016 fiscal year. The obtained results show that CSR performance is positively associated with SR. Whilst, firm's attributes with different surrogate indicators indicate mixed results. Overall, this study provides empirical evidence, in which CSR performance and the firm's attributes play a pivotal role as the drivers of sustainability reporting.

Keywords: CSR performance; Firm's attributes; Sustainability reporting.

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1. INTRODUCTION

Sustainability reporting (SR) is currently considered as an established effort to disclose more relevant and transparent non-financial information to public. Referring to the report released by KPMG, (2017) on the survey of Corporate Responsibility reporting in 49 countries, it is reported that 4,900 companies have engaged in sustainability reporting. The result of a survey using N100 and G250 companies showed that most global firms linked their non-financial-related information (i.e., environmental, social, and governance) to their annual or stand-alone (sustainability) reports. This indicates that global firms have been aware of the importance of social and environmental issues, such as human rights, and linking carbon targets to the global climate goal. However, following the positive trend of sustainability reporting, a clear-cut and precise factor that could be used to explain the determinants of sustainability reporting is still under-researched (Kolk & Perego, 2010).

The previous empirical evidence reveals that the firm's motive to involve in sustainability reporting corresponds to economic reasoning, which is based on a thorough cost-and-benefit analysis (Cormier & Magnan, 2015). For instance, the study of Boesso & Kumar, (2007) examined the drivers of voluntary disclosure practice by comparing the case of Italian and U.S. firms. Their results showed that in addition to investors' information needs, several issues, such as firm's concern on stakeholders' management, intangible asset, and market complexity, appeared to affect

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both volume (quantity) and voluntary disclosure quality. In line with this, Kolk & Perego, (2010) reported on the factors deemed associated with voluntary decision to disclose non-financial information in the sustainability report. Their findings noted that country-institutional factor and a meticulous cost-and-benefit analysis drive the decision to engage with sustainability reporting.

Given the prior literature in the area of sustainability reporting, the objective of this paper is more focused on exploring the association between CSR performance, firm's attributes, and sustainability reporting. More in detail, this paper proposes research question whether or not CSR performance and firm's attributes are associated with the propensity of engaging in sustainability reporting. This paper is deemed interesting and different from the previous works of literature as it adopts the setting of developing country (Indonesia). The debate regarding the mandatory disclosure of non-financial information in Indonesia has been initiated since 2007. The adoption of Indonesian Law No. 40 in 2007 is deemed as the triggering regulation concerning the importance of non-financial information reporting in Indonesia (Waagstein, 2011). In Article 74 of 2007, it was stated that the limited liability corporate law No. 40 required companies operating in the Environmentally Sensitive Industries (ESIs) to implement CSR practice. In 2012, Government Regulation No. 47 on the social and environmental responsibility was restated and required all companies that actively operating in the field and or related to the natural resource exploration to engage with CSR activity and its reporting mandatorily. Interestingly, even though the call of CSR or sustainability reporting is supposed to be mandatory since 2007, the procedures and the practices of sustainability reporting in Indonesia are somehow still unstandardized and unstructured.

Regardless of the reporting process, firms with proper CSR practice have recognized the benefits of engaging with sustainability matters, where the dimension of sustainability reporting accounts for the environmental, social, and governance aspects (GRI, 2014). In this sense, when the firm deals with responsible business activities, it is expected that the sustainability of either environmental or societal will ensure the business legitimacy, and other potential benefits such as better access to finance (Cheng, Ioannou, & Serafeim, 2014), lower cost of capital (Dhaliwal, Li, Tsang, & Yang, 2014), higher reputation (Axjonow, Ernstberger, & Pott, 2016), and better financial performance (Suteja, Gunardi, & Auristi, 2017) that can be perceived by the firm in the long-run. The Indonesian capital market (IDX) is considered as an interesting context because it has shown a generally good economic performance since a couple of decades ago (Usman, 2016). Additionally, less study has tried to investigate the associate factors that might drive the adoption and the decision to engage in sustainability reporting in IDX. Given that, sustainability reporting is deemed unique due to its nature that is already mandatory but still not well-implemented, which leads to a large variety of reporting practices (Deegan, Cooper, & Shelly, 2006; Utama, 2011). Therefore, this paper offers several contributions. First, to provide empirical evidence on the drivers of sustainability reporting in the Indonesian capital market, particularly after the enactment of Government Regulation No. 47 in 2012. Second, to understand better the reason why and how companies engage in sustainability reporting.

The structure of this paper is drawn as follows. First, the introduction section. Second, the literature review, which elaborates on the relevant issue and theoretical context. Third, the research method, which provides a brief exhibition regarding the sampling procedures and statistical analysis. Fourth, the section of results and discussion highlights the interpretation of the statistical results

and its discussion. Fifth, conclusion, which summarizes the overall findings and suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. *CSR Performance, Firm's Attributes, and Sustainability Reporting*

Legitimacy theory is used as the underpinning concept in supporting the hypothesis formulation. As stated by one of the most cited paper by Suchman, (1995 page. 574), legitimacy is defined as "*a generalized perception or assumption that the action of an entity is desirable, proper, or appropriate with some socially constructed system of norms, values, beliefs, and definition*". While, sustainability reporting is defined as a firm activity to report on environmental, social, and governance impacts of its daily operational routines (Corporate Register, 2008). Given these definitions, legitimacy theory is deemed appropriate in explaining the process and mechanism regarding the extent through which firms are willing to deal with sustainability reporting. As the companies might want to legitimate their business and being acknowledged in a proper social-contract with the community, companies are required to publish their sustainability-related actions (i.e., negative and positive news) to the public through CSR or sustainability report. Thus, it may enable stakeholders and related parties to evaluate better firm's impact with regard to their business operation. For this reason, one might consider CSR performance reflected by the CSR or sustainability report as one of the indicators of a firm's propensity to engage with sustainability reporting (Adams, Muir, & Hoque, 2014; Lopatta, Jaeschke, & Chen, 2017). The logic is that CSR performance reflects the firm's environmental, social, and governance impacts due to its business operation engagement. The higher the impact reflected by CSR performance, the higher a firm propensity to engage in sustainability reporting.

Hypothesis 1: CSR performance is positively associated with the propensity to engage in sustainability reporting.

Hypothesis two is also developed by employing the legitimacy theory. Since legitimacy is necessarily crucial for the company to obtain the right to operate from society, we conjecture that the company has to reach a certain economic level in order to be socially and environmentally acknowledged by the social-community. In this regard, we presume that the small companies might not have been able to deal with the social and environmental issues as they are more concerned about reaching the expected profit. In this scale, the community does not get too demanding as long as these companies operating appropriately without severely harming the environment (Cormier et al., 2005; Manchiraju & Rajgopal, 2017). However, when the economic and business scale is growing, the community is more likely to be more sensitive and will monitor the firm's operations actively. In this situation, social pressures and scrutiny may appear, and large size companies need to consider the sustainability of their businesses by responsibly responding to the community's demands (Cho, Freedman, & Patten, 2012). The study of Siregar & Bachtiar, (2010) provided empirical evidence showing that firm size is positively associated with CSR practice. Their finding indicates that large companies have more resources to deal with CSR-related activities, while small companies are less likely to engage with CSR-related activities as they do have insufficient resources. Therefore, we conjecture that the larger firm's size, the higher

propensity to obtain or maintain its legitimacy as a sustainability report is used as an organizational legitimacy tool. Given the underpinning theory and the previous works of literature, hypothesis two is designed as follows.

Hypothesis 2: Firm size is positively associated with the propensity to engage in sustainability reporting.

In line with the idea of legitimacy, when the companies have generated stable profits, they could decide to obtain or maintain their legitimacy through various media channels (Bebbington, Larrinaga, & Moneva, 2008). Correspondingly, the increasing firm size needs to be in line with a sufficient amount of capital that could also be expected from the external funding. For this reason, leverage is deemed as an appropriate component of working capital to expand the economic scale of production (Kamaludin, Susena, & Usman, 2015; Nurazi, Santi, & Usman, 2015; Kamaludin & Usman, 2017; Usman, 2019). Since debt itself is obtained from the third-party (i.e., creditors), there could be a unique condition where creditors might have the attention to the sustainable financing issues (Mahoney, Thorne, Cecil, & LaGore, 2013; Sierra, Zorio, & García-Benau, 2013). In this context, investors or creditors with high awareness of sustainability concerns would demand high transparency about their investment. Therefore, we argue that the companies' increasing amount of leverage might enhance market disciplinary mechanism, in which investors and creditors would demand timely and publicly open documents not only on financial but also on the non-financial information disclosure. Thus, hypothesis three is formulated as follows.

Hypothesis 3: Firm leverage is positively associated with the propensity to engage in sustainability reporting.

Hypothesis four is designed with the argument that when a firm size gets larger, the information with respect to its ability to generate bigger earnings is considered as an essential attribute. Price-earnings ratio (PER), indicates the amount of money an investor could expect to invest in a particular firm to receive one unit of currency of that company's earnings. The information on earnings is disclosed in financial reports, which is, in some cases, reported together with non-financial information in the annual report. As noted by Nurazi, Kananlua, & Usman, (2015), Nurazi & Usman, (2015), Nurazi, Usman, & Kananlua, (2016), and Nurazi & Usman, (2019) the fundamental of financial or non-financial information could be discovered by the stakeholders through the internet. When the firms disclosed this information to the public, it is presumed that firms try to increase their recognition among stakeholders. The information of PER will eventually show how much investors are willing to pay for every IDR of earnings. Thus, a firm's ability to generate positive earnings is conjectured to be associated with the firm's propensity to engage in sustainability reporting. Given this logic, we formulate hypothesis four as follows.

Hypothesis 4: Price-earnings ratio is positively associated with the propensity to engage in sustainability reporting.

Apart from the price-earnings ratio, information on dividend yield is also essential. In particular, long-term investors might expect dividend payment as the return of their investments. When a company decides to pay a dividend, it sends a signal that the company has recently performed well in its business routines. As reported by Ernst & Young, (2017), a positive profitability indicator such as dividend payment could be linked to a higher probability of CSR-related activity

engagement and its reporting. Since sustainability reporting is made based on the manager's thorough cost-and-benefit analysis, we, therefore, conjecture that a firm with good financial performance in terms of dividend payment has a higher propensity to engage in sustainability reporting. Hypothesis five is developed as follows.

Hypothesis 5: Dividend yield is positively associated with the propensity to engage in sustainability reporting.

In the circumstance where; 1) companies' size get larger, 2) companies adopt different combinations of capital structures, and 3) companies have volatile earnings ratio, may lead the investors to have some concerns on stock price performance and price volatility. This is rational since more and more investors are noticing and including "*green companies*" in their portfolio of investment (Mock, Rao, & Srivastava, 2013). Take, for instance, DJSI (Dow Jones Sustainability Index) contains companies that relatively pay more attention to the sustainable-related practice. Each company incorporating in DJSI index should publish non-financial information either in a stand-alone sustainability report or combined in their annual reports. In this regard, we argue that companies with positive growth on their stock price and positive price volatility are inclined to gain better returns, which allows them to better deal with a higher probability of engaging with sustainability reporting. When the stock price movement shows a positive trend, there is a signal that companies are able to generate better returns for their investors and allocate sufficient budget for CSR-related activity. Otherwise, when the stock price movement shows a negative trend and negative price volatility, the firms are more likely to postpone engaging with sustainability reporting. Therefore, hypotheses six and seven are delivered as follows.

Hypothesis 6: Stock price is associated with the propensity to engage in sustainability reporting.
Hypothesis 7: Stock price volatility is associated with the propensity to engage in sustainability reporting.

2.2. Research Model

To better understand the proposed hypotheses development, we provide a visualization of the conceptual links as well as its operationalization in a research model. Figure 1 displays.
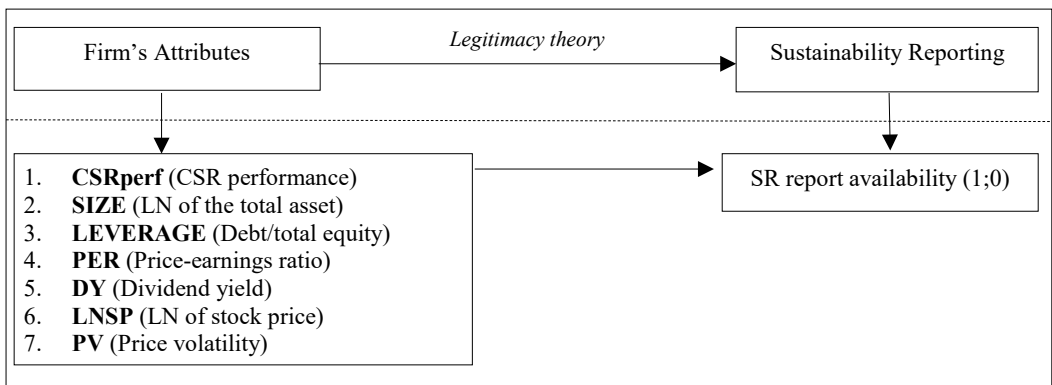
Figure 1: Research Model

Figure 1 shows that the concept of firm's attributes is proxied by six variables (SIZE, LEVERAGE, PER, DY, LNSP, and PV). CSR performance (CSRperf), in this context, is also deemed as one of the firm's attributes. However, it is inserted as a stand-alone independent variable, since its characteristic is more into a non-financial-based measure. While, sustainability reporting is represented by the availability of sustainability reports of the related sample.

3.   RESEARCH METHOD

3.1.   *Data and Sample*

This study investigates the drivers of sustainability reporting in the setting of Indonesian publicly listed companies (PLCs). Thus, the population distribution is drawn from the whole PLCs in various sectors. Nonetheless, since this study concerns more on the sustainability reporting practice, the final sample is taken from the companies which voluntarily have published sustainability reports. More in detail, we collect a number of PLCs from the Indonesian capital market with sustainability report publications (stand-alone or combined in the annual reports) from 2012 to 2016. The data providers were from Thomson Reuters EIKON data stream for financial-related variables (i.e., SIZE, LEVERAGE, PER, DY LNSP, PV), and Thomson Reuters ASSET4 database for non-financial information (i.e., SR, CSRPerf). The detail of sample selection procedure is available as follows.

Table 1: Sample Selection Procedure

No	Sampling procedure	Number of firms (n)	Firm-quarterly observations
1	Companies listed in the Indonesian capital market (current data in the 1st semester 2018).	592	16,576
2	Companies with no sustainability reports covered by the ASSET4 database from 2012 to 2016.	(555)	(11,100)
3	Final samples with complete financial and non-financial data observations from Q1;2012 to Q4;2016.	37	740

We discover that there are 37 PLCs with complete data observations from the first quarter (Q1) of 2012 to the last quarter (Q4) of 2016 fiscal year. The samples are categorized based on their sectors and further classified into industry groups. In total, we extracted the data from ten sectors of industries with 21 specific industrial groups. Table 2 shows.

Table 2: Sample Classification Based on the Global Industry Classification Standard (Sectors and Industry Groups)

No	Sector	Industry Group	No of firms	Firm-quarterly observations	Percentage (%)
1	Communication Services	Fixed Line Telecom	1	20	2.70
		Broadline Retailers	1	20	2.70
		Broadcast & Entertain	3	60	8.11
		Mobile Telecom	2	40	5.41
		Telecom. Equipment	1	20	2.70
2	Consumer Discretionary	Auto Parts	1	20	2.70
4	Consumer Staples	Food Products	2	40	5.41
		Personal Products	1	20	2.70
		Tobacco	2	40	5.41
5	Energy	Coal	4	80	10.81
		Gas Distribution	1	20	2.70
6	Financials	Banks	5	100	13.51
7	Health Care	Pharmaceuticals	1	20	2.70
8	Industrials	Heavy Construction	1	20	2.70
		Farm Fish Plantation	2	40	5.41
		Comm. Vehicles, Trucks	1	20	2.70
		Transport Services	1	20	2.70
		Industrial Suppliers	1	20	2.70
9	Materials	Nonferrous Metals	1	20	2.70
		General Mining	1	20	2.70
10	Real Estate	Real Estate Hold, Dev	4	80	10.81
	Total		37	740	100

Notes: The quarterly (1st quarter= January, February, March; 2nd quarter= April, May, June; 3rd quarter= July, August, September; 4th quarter= October November, December) data is extracted from 37 firms for five years observations from 2012 to 2016 (37 firms × 4 quarters × five years= 740 quarterly observations). For each quarter, we picked the information in the last month of the quarter groups as the final data used in the logit regression analysis (Q1: data in March; Q2: data in June; Q3: data in September; Q4: data in December). The data of Q1, Q2, Q3, and Q4 are heterogeneous, and therefore we have enough variation in the dataset.

3.2. Logistic Regression Model

To empirically investigate the driver of sustainability reporting in Indonesia, the following logit regression model is proposed.

$$SR_{i,t}(0;1) = \alpha + \beta1 CSRperf_{i,t} + \beta2 SIZE_{i,t} + \beta3 LEVERAGE_{i,t} + \beta4 PER_{i,t} + \beta5 DY_{i,t} + \beta6 LNSP_{i,t} + \beta7 PV_{i,t} + \varepsilon \qquad (1)$$

Logit regression model provides the potential association test for the dependent variable that is scaled using binomial data. In this model, SR is the dependent variable and denotes as sustainability report, where the data of SR is marked 1 if the PLCs published non-financial information in the form of a stand-alone report or combined in the annual report; 0 otherwise. CSRperf, is the ranking of CSR or SR-related impact as evaluated by the CSR ranking company (the ASSET4). SIZE is the indicator of company's characteristics scaled by the LN of total assets. LEVERAGE denotes the leverage ratio, counted by dividing the total liabilities with total shareholders' equity. PER counts the market value per share over earnings per share. DY is the dividend yield, counted as the percentage obtained by dividing annual dividend per share with price per share. LNSP is the logarithm natural of stock price. The last variable is PV, which denotes stock price volatility.

Apart from examining the link among the contemporaneous variables, we also anticipate the potential elements of lagged independent variables on the variation of dependent variable. Hereby, we notice that the effect of CSR performance (CSRperf) from the previous time could be the driver of companies' decision to engage in sustainability reporting (SR). Also, the previous information on firm's attributes play an important role where the attributes in this regard correspond to the financial performance. There is also a potential assumption that the proposed model is incurred by the endogeneity issue of omitted variable bias. To deal with this issue, we proposed a statistical logit model with one-quarterly time-lagged independent variables in explaining the variation of the dependent variable (see model 2). The decision to use one-quarter time-lagged refers to the argument of Botosan & Harris, (2000) and Usman & Yennita (2018), where the motivation of companies to change the disclosure frequency brings several impacts to the consecutive decisions taken by the manager as a decision-maker. Additionally, their studies pointed out that quarterly publication of non-financial information is value-relevant for stakeholders. To confirm that the statistical test provides robust and hold results, we also extend the test by employing longer lagged independent variables, where we test the association of the 2nd, 3rd, 4th, and 8th (2 years) quarter lagged independent variables with the contemporaneous data of sustainability reporting (SR).

$$SR_{i,t}(0;1) = \alpha + \beta 1 CSRperf_{i,t-1} + \beta 2 SIZE_{i,t-1} + \beta 3 LEVERAGE_{i,t-1} + \beta 4 PER_{i,t-1} + \beta 5 DY_{i,t-1} + \beta 6 LNSP_{i,t-1} + \beta 7 PV_{i,t-1} + \varepsilon \qquad (2)$$

Statistical model 2 illustrates the logit panel regression model employed in the robustness test. The subscript $_i$, $_t$, and $_{-1}$ indicate the company $_i$ in time $_t$, where time $_{-1}$ denotes quarter minus $_1$ (prior quarterly observation in the panel data regression analysis). Meanwhile, the other independent variables have the same operational definition, as previously explained in statistical model 1. The justification regarding the independent variable choices is also based on the prior literature. Take, for example, the study of Brammer & Pavelin, (2006) found that less indebted companies are associated with a higher probability of engaging with voluntary environmental disclosure, in which they also pointed out that the firm size drives the propensity of sustainability reporting practice. The same case occurred when Cormier et al., (2005) investigated the determinant of the environmental disclosure level. In this case, they used several financial performances, such as leverage, size, and market returns.

4.   RESULTS AND DISCUSSION

4.1.   Descriptive Statistics

To empirically investigate the drivers of sustainability reporting in Indonesia, we firstly start by providing the detail of descriptive information on the variable of interests. Table 3 explains.

Table 3: Descriptive Statistics

Variables	Obs	Mean	Sd	Min	p25th	p50th	p75th	Max
SR	740	0.652	0.476	0.000	0.000	1.000	1.000	1.000
CSRperf	740	74.170	41.591	13.315	31.195	79.06	114.205	143.125
SIZE	740	24.401	1.287	21.772	23.524	24.104	24.959	27.663
LEVERAGE	740	71.599	238.926	-883.33	13.10	45.825	77.13	2834.17
PER	740	37.186	91.090	3.50	13.65	19.50	28.45	1176.5
DY	740	2.373	2.216	0.000	1.140	1.975	2.945	29.130
LNSP	740	8.312	1.266	5.481	7.514	8.237	9.068	11.146
PV	740	32.674	7.451	18.870	27.495	32.030	36.920	62.050

Information in Table 3 is extracted from Thomson Reuters database. In this case, descriptive analysis is conducted on the compilation of CSR performance information, firm's financial attributes, and the availability of sustainability reports of related sample. As shown in Table 3, SR is the dependent variable, showing that the mean score of companies with SR adoption stands around 65.2 percent on average. The following variables are CSR performance and firm's attributes, which take the position as the independent variables. The first independent variable is CSRperf. This variable shows a mean value of 74.170 on average. The second independent variable is SIZE. It shows mean value as 24.401 on average, followed by LEVERAGE (71.599), PER (37.186), DY (2.373), LNSP (8.312), and PV (32.674) on average. Apart from the information on the mean value, we also provide information about the minimum, 25th percentile, median, 75th percentile, and the maximum values. The next empirical part continues to the correlation test matrix, as can be seen in Table 4.

Table 4: Correlation Matrix

No	Variable	1	2	3	4	5	6	7	8
1	SR	1							
2	CSRperf	0.686***	1						
3	SIZE	0.455***	0.352***	1					
4	LEVERAGE	0.071	-0.078*	0.02	1				
5	PER	0.093*	0.026	0.01	-0.061	1			
6	DY	0.240***	0.355***	-0.021	-0.064	-0.180***	1		
7	LNSP	0.257***	0.335***	0.157***	-0.038	-0.319***	0.282***	1	
8	PV	-0.209***	-0.194***	-0.259***	-0.058	0.445***	0.008	-0.533***	1

SR:	Sustainability report: Binomial data, 1 if companies disclosed SR (CSR)-related information, 0 otherwise.
CSRperf:	CSR performance: The average value of the environmental, social, and governance performance pillar scores covered by the ASSET4 rankings.
SIZE:	Company size: Logarithm natural (LN) of Total assets.
LEVERAGE:	Leverage: Total liabilities/Total shareholders' equity.
PER:	Price-earnings ratio: Market value per share/Earnings per share.
DY:	Dividend yield: Annual dividends per year/Stock's price per year.
LNSP:	Stock price: The logarithm natural (LN) of stock price.
PV:	Price volatility: The standard deviation of quarterly stock price movement within the period of observation.

Notes: Table 4 shows correlation coefficients among the employed variables. Each asterisk indicates statistical significance where; *** $p<0.01$, ** $p<0.05$, and * $p<0.1$ respectively using a two-tail test.

Table 4 displays the information of the correlation test output. The highlight of Table 4 reports that; First, CSRperf has shown a positive and significant correlation ($p < 0.01$) with SR. Second, SIZE is reportedly correlated to SR, where this correlation indicates a positive and significant relationship ($p < 0.01$). Third, LEVERAGE is insignificantly correlated ($p > 0.05$) to SR, yet showing a positive sign. Furthermore, the correlation between PER and SR displays a positive and significant correlation ($p < 0.10$). DY and SR also indicate a positive and significant correlation ($p < 0.01$). The same propensity is shown by the correlation between LNSP and SR (positive and significant at $p < 0.01$). The last correlation is identified between PV and SR, which reports a negative and significant correlation ($p < 0.01$).

4.2. *Model Selection and Hypotheses Testing*

Before running the proposed statistical model, we first need to test the model selection. Since the model of analysis utilizes logit panel data analysis, the combination of cross-sectional and time-series data will considerably increase the predictability of outputs (Allison, 2009; Usman & Tandelilin, 2014; Williams, 2015). Referring to Baltagi, (2005) and Allison, (2009), three techniques could be adopted in panel data estimation (i.e., Pooled Least Squared (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM)). The proper test should be performed by following the model selection. Chow test and Breusch-Pagan Lagrange Multiplier (B-P LM) are necessary to compare between PLS and FEM model (Chow), and between PLS and REM model (B-P LM). Furthermore, Hausman test is conducted to compare FEM and REM models (Gujarati & Porter, 2010). Given the proper test that should be initiated to choose one of the proposed models, we run Chow test to find whether PLS or FEM model is appropriate. In the un-tabulated

information, we report that the Chow test output does not support the null hypothesis, which suggests that the output of Chow test recommends using FEM. Additionally, we also run the Breusch-Pagan Lagrange Multiplier (B-P LM) test to decide whether the proposed model follows PLS or REM. The obtained output indicates that the p-value (0.000) is significant at 0.01 level (Breusch-Pagan test: LM = 63.113). In this respect, we reject the null hypothesis and infer that REM is more appropriate than the PLS model. In the end, we test whether the proposed statistical model adopts FEM or REM by applying Hausman test. The estimation of Hausman test output notifies that the cross-section random probability for the proposed statistical model is significant (p < 0.01), meaning the Hausman test result suggests using FEM model. In this case, as Allison (2009) pointed out, when the same subject is measured using different data at two or more points in time, the subject itself could be used as its own control. Williams, (2015) further strengthened this argument that in regards to the utilization of binary dependent variables, the analysis can be done by employing a fixed-effects logit model. Since the model selection recommends employing the FEM model, Table 5 provides the results of main analysis and hypotheses testing.

Table 5: Main Analysis (Logit Regression)

$$SR_{i,t}(0; 1) = \alpha + \beta 1 CSRperf_{i,t} + \beta 2 SIZE_{i,t} + \beta 3 LEVERAGE_{i,t} + \beta 4 PER_{i,t} + \beta 5 DY_{i,t} + \beta 6 LNSP_{i,t} + \beta 7 PV_{i,t} + \varepsilon$$

VARIABLE	Hypotheses	Expected sign	SR
$CSRperf_{i,t}$	H1	+	0.047***
			(0.005)
$SIZE_{i,t}$	H2	+	0.788***
			(0.133)
$LEVERAGE_{i,t}$	H3	+	0.006***
			(0.001)
$PER_{i,t}$	H4	+	0.014***
			(0.003)
$DY_{i,t}$	H5	+	0.191**
			(0.076)
$LNSP_{i,t}$	H6	+/-	0.091
			(0.111)
$PV_{i,t}$	H7	+/-	-0.046**
			(0.021)
Constant			-21.80***
			(3.326)
Year fixed-effect			Yes
Industry fixed-effect			Yes
Observations			740
Pseudo-R^2			0.554
Robust standard errors are in the parentheses.			
*** p<0.01, ** p<0.05, * p<0.1			

Table 5 presents the information on the logit regression analysis output with FEM model. In this study, we use balanced panel data analysis with quarterly time series analysis. Panel data analysis

is suitable in investigating the effect of independent variables on the dependent variable with a large number of observations. Since the number of observations in this study is pretty high (740 firm-quarterly observations), the estimation result is expected to provide the most efficient outputs. As shown by Table 5, the independent variables (CSRperf, SIZE, LEVERAGE, PER, and DY) are positively and significantly associated with the dependent variable (SR). This suggests that the increased variation in independent variables increases the variation of the dependent variable. However, in a particular case, PV indicates a negative association and statistically significant (p < 0.01) with SR, which is in line with the *a priori* notion. More precisely, CSRperf reveals a positive and significant (β= 0.047 and p < 0.01) association with SR. The next association between SIZE and SR shows a positive coefficient regression (β= 0.788) and statistically significant (p < 0.01). The third independent variable is LEVERAGE, which reports a similar propensity with positive and significant coefficient value (β= 0.006 and p < 0.01). PER also indicates a positive and significant association (β= 0.014 and p < 0.01) with SR. DY as the representation of companies' ability to generate returns (dividend) for its stakeholders also consistently exhibits a positive and significant (β= 0.191 and p < 0.05) association with SR. LNSP shows a positive but statistically insignificant association with SR (β= 0.091 and p > 0.1). While the last independent variable (PV) indicates a negative and significant association (β= -0.046 and p < 0.05) with the dependent variable (SR).

4.3.   *Sensitivity Analysis*

Instead of concurrently test the statistical model in a multivariate analysis, the sensitivity analysis is also deemed necessary to observe the magnitudes and the changes in the coefficient regression. Thus, a sensitivity analysis with stepwise logit panel data regression is carried out as follows.

Table 6: Sensitivity Analysis

VARIABLE	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$CSRperf_{i,t}$	0.054***	0.047***	0.050***	0.050***	0.047***	0.047***	0.0467***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
$SIZE_{i,t}$		0.869***	0.903***	0.860***	0.872***	0.840***	0.788***
		(0.119)	(0.128)	(0.121)	(0.121)	(0.129)	(0.133)
$LEVERAGE_{i,t}$			0.002***	0.005***	0.006***	0.006***	0.005***
			(0.0005)	(0.001)	(0.001)	(0.001)	(0.001)
$PER_{i,t}$				0.010***	0.012***	0.012***	0.014***
				(0.002)	(0.002)	(0.002)	(0.002)
$DY_{i,t}$					0.180**	0.150*	0.191**
					(0.074)	(0.082)	(0.076)
$LNSP_{i,t}$						0.167	0.091
						(0.121)	(0.111)
$PV_{i,t}$							-0.046**
							(0.021)
Constant	-2.665***	-23.29***	-24.39***	-23.94***	-24.53***	-25.05***	-21.80***
	(0.238)	(2.860)	(3.105)	(2.935)	(2.948)	(2.802)	(3.326)
Year fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	740	740	740	740	740	740	740

VARIABLE	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pseudo-R^2	0.441	0.506	0.526	0.542	0.547	0.549	0.554

Robust standard errors are in the parentheses.

*** p<0.01, ** p<0.05, * p<0.1

The output of Table 6 illustrates that every independent variable has shown a consistent expected sign. The stepwise panel data regression outputs notify significant results for each association between the independent and dependent variables. Take, for instance, CSRperf and SIZE suggest a positive and significant association with SR. Even though the test is conducted in sequence (stepwise), CSRperf and SIZE persistently suggest positive signs and significant relationship (p < 0.01). Also, the magnitudes of CSRperf and SIZE get bigger after the inclusion of the next additional independent variables (see columns 2, 3, and 4). This denotes the increasing CSRperf and SIZE of the related companies incline to result in a higher propensity of engaging with sustainability reporting. LEVERAGE displays a similar pattern, in which the stepwise panel regression analysis indicates a positive and statistically significant association with SR (p < 0.01). Again, this output suggests a corresponding result with the previous main analysis by employing logistic regression analysis. PER depicts a positive and significant relationship with SR, meaning that the increase in price-earnings indicator positively affects the probability of publishing a sustainability report. Additionally, DY, in the same way, shows a positive and significant relationship with SR. However, there is a condition where the coefficient regression between DY and SR slightly drops (β= 0.150 and p < 0.1) when we include LNSP, and it again gets stronger when we insert PV (β= 0.191 and p < 0.05). Moreover, the relationship between LNSP and SR indicates positive association but statistically insignificant (p > 0.05). Lastly, PV shows a negative and significant coefficient beta (β= 0.046 and p < 0.05) on SR.

4.4. Findings and Discussion

Recall back to the statistical results in Tables 5 and 6, the obtained outputs show that there is a mixed and significant association between the firm's attributes and sustainability reporting practice. Our notion is, firm's attributes are related to sustainability reporting. Hereby, CSR performance scores, as obtained from the ASSET4 database, is considered as the surrogate indicator to measure firm's attributes empirically. Additionally, we also use six proxies to measure and quantify firm's attributes and their effects on a firm's propensity of dealing with sustainability reporting. Consistent with prior studies in the same field, it is reported that SIZE, LEVERAGE, PER, DY, LNSP, and PV are positively and negatively associated with the probability of disclosing non-financial information in a stand-alone sustainability report or integrated into the annual report.

Most of the proposed hypotheses are statistically supported and performed as our expectations. Hypothesis one tests the association between CSRperf and SR. The information in Tables 5 (logit regression), 6 (sensitivity analysis), and 7 (robustness check) provide consistent results, in which the higher CSRperf positively in line with the higher probability of companies publishing sustainability reports (SR). Hypothesis two predicts whether the larger SIZE of the companies relates to the higher probability of engaging with SR. The obtained empirical output suggests that there is a positive and significant association between SIZE and SR. This association could also be driven by the social pressure and companies' motivation to obtain or to maintain its legitimacy

with their stakeholders (Colleoni, 2013). Hypothesis three displays positive coefficient regression and significant association with SR. This proves that the *a priori* notion of the hypothesis development is empirically proven. The higher leverage used by the companies increases the propensity of higher market discipline. In this context, the market discipline mechanism emerges as the stakeholders demand more accountability and transparency. To deal with the transparency issue, one of the ways that could be done by the companies is by publishing non-financial information together with the mandatory financial information disclosure.

Moreover, concerning hypotheses four and five, the association as shown by PER and DY with SR are positive and statistically significant. As seen in Table 6, PER and DY as the indicators of firm's profitability show positive coefficient regression. The increasing values on PER and DY correspond to the increasing probability of engaging with sustainability reporting. As written in the literature review section, it is clear that companies with positive financial performance are very likely to engage with sustainability reporting. Since the companies have sufficient budget, while at the same time society and investors are putting more pressures on sustainability issues, thus firms through manager discretion could decide to engage with better sustainability reporting. Moreover, hypothesis six suggests a positive but insignificant association with SR. The proposed hypothesis six is proven by the same expected sign of coefficient regression. However, this association is statistically unsupported. The last hypothesis is hypothesis seven, which suggests a negative and significant association with SR.

Apart from the result of the main analysis, we also put a concern on the goodness of fit model displayed in the pseudo R^2 value. The obtained pseudo R^2 indicates neither high nor low predictability (55.4%). However, after meticulously conducting sensitivity analysis by employing stepwise regression, the value of goodness of fit model is consistently increasing. Furthermore, the other issue could be associated with the reverse causality problem, where CSRperf in the proposed statistical model plays a role as an independent variable. In this regard, if the probability of disclosing non-financial information either in SR or CSR report could be driven by the score of previous CSR performance, the reverse channel may exist. The counter-argument is that, CSRperf score could also be driven by the managerial decision whether or not to disclose CSR or SR-related activities. Given the problem of dual channels like this, we would presume that disclosing non-financial information as noted in the body of literature is merely the manager's discretion.

5.   ROBUSTNESS CHECK

To confirm that the obtained results hold and robust, we deliberately run a robustness check. The design of the robustness check is similar to the previous procedures in the main analysis. In this case, we count and generate one-quarterly time-lagged independent variables from the dataset since we conjecture that the past information could have been impacting the manager's decision to disclose non-financial information in the consecutive sustainability report (SR). To ensure that the information from one-quarter time-lagged holds with the main analysis, we extended the logit regression analysis using the 2nd, 3rd, 4th, and 8th quarter-lag periods. Logistic regression analysis is available as follows.

Table 7: Logistic Regression Analysis with One, Two, Three, Four-quarterly and Two Yearly Time-lag (2012-2016)

$$SR_{i,t}(0;1) = \alpha + \beta1CSRperf_{i,t-1} + \beta2SIZE_{i,t-1} + \beta3LEVERAGE_{i,t-1} + \beta4PER_{i,t-1} + \beta5DY_{i,t-1} + \beta6LNSP_{i,t-1} + \beta7PV_{i,t-1} + \varepsilon$$
$$SR_{i,t}(0;1) = \alpha + \beta1CSRperf_{i,t-2} + \beta2SIZE_{i,t-2} + \beta3LEVERAGE_{i,t-2} + \beta4PER_{i,t-2} + \beta5DY_{i,t-2} + \beta6LNSP_{i,t-2} + \beta7PV_{i,t-2} + \varepsilon$$
$$SR_{i,t}(0;1) = \alpha + \beta1CSRperf_{i,t-3} + \beta2SIZE_{i,t-3} + \beta3LEVERAGE_{i,t-3} + \beta4PER_{i,t-3} + \beta5DY_{i,t-3} + \beta6LNSP_{i,t-3} + \beta7PV_{i,t-3} + \varepsilon$$
$$SR_{i,t}(0;1) = \alpha + \beta1CSRperf_{i,t-4} + \beta2SIZE_{i,t-4} + \beta3LEVERAGE_{i,t-4} + \beta4PER_{i,t-4} + \beta5DY_{i,t-4} + \beta6LNSP_{i,t-4} + \beta7PV_{i,t-4} + \varepsilon$$
$$SR_{i,t}(0;1) = \alpha + \beta1CSRperf_{i,t-8} + \beta2SIZE_{i,t-8} + \beta3LEVERAGE_{i,t-8} + \beta4PER_{i,t-8} + \beta5DY_{i,t-8} + \beta6LNSP_{i,t-8} + \beta7PV_{i,t-8} + \varepsilon$$

VARIABLES	Expected sign	(1)	(2) IV with 2 quarter-lag	(3) IV with 3 quarter-lag	(4) IV with 4 quarter-lag	(5) IV with 2 years lag (8 quarter-lag)
$CSRperf_{i,t-1}$	+	0.044^{***}	$CSRperf_{i,t-2}$ 0.042^{***}	$CSRperf_{i,t-3}$ 0.04^{***}	$CSRperf_{i,t-4}$ 0.04^{***}	$CSRperf_{i,t-8}$ 0.0382^{***}
		(0.005)	(0.006)	(0.006)	(0.006)	(0.008)
$SIZE_{i,t-1}$	+	0.747^{***}	$SIZE_{i,t-2}$ 0.707^{***}	$SIZE_{i,t-3}$ 0.668^{***}	$SIZE_{i,t-4}$ 0.562^{***}	$SIZE_{i,t-8}$ 0.387^{***}
		(0.133)	(0.134)	(0.135)	(0.123)	(0.125)
$LEVERAGE_{i,t-1}$	+	0.006^{***}	$LEVERAGE_{i,t-2}$ 0.006^{***}	$LEVERAGE_{i,t-3}$ 0.006^{***}	$LEVERAGE_{i,t-4}$ 0.003^{**}	$LEVERAGE_{i,t-8}$ 0.002^{***}
		(0.001)	(0.001)	(0.001)	(0.00017)	(0.00007)
$PER_{i,t-1}$	+	0.016^{***}	$PER_{i,t-2}$ 0.016^{***}	$PER_{i,t-3}$ 0.017^{***}	$PER_{i,t-4}$ 0.001^{***}	$PER_{i,t-8}$ 0.010^{***}
		(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
$DY_{i,t-1}$	+	0.182^{**}	$DY_{i,t-2}$ 0.163^{**}	$DY_{i,t-3}$ 0.138^{*}	$DY_{i,t-4}$ 0.032	$DY_{i,t-8}$ -0.072
		(0.073)	(0.08)	(0.072)	(0.08)	(0.102)
$LNSP_{i,t-1}$	?	0.093	$LNSP_{i,t-2}$ 0.097	$LNSP_{i,t-3}$ 0.10	$LNSP_{i,t-4}$ 0.151	$LNSP_{i,t-8}$ 0.251^{*}
		(0.112)	(0.112)	(0.112)	(0.117)	(0.138)
$PV_{i,t-1}$	?	-0.054^{**}	$PV_{i,t-2}$ -0.061^{***}	$PV_{i,t-3}$ -0.07^{***}	$PV_{i,t-4}$ -0.081^{***}	$PV_{i,t-8}$ -0.098^{***}
		(0.022)	(0.022)	(0.022)	(0.022)	(0.026)
Constant		-20.39^{***}	-19.00^{***}	-17.61^{***}	-14.05^{***}	-9.511^{***}
		(3.316)	(3.331)	(3.359)	(3.116)	(3.282)
Observations		701	662	623	584	428
Year fixed-effect		Yes	Yes	Yes	Yes	Yes
Industry fixed-effect		Yes	Yes	Yes	Yes	Yes
Pseudo-R^2		0.534	0.5123	0.4907	0.4561	0.4167

Robust standard errors are in the parentheses.

Each asterisk indicates statistical significance where; *** $p<0.01$, ** $p<0.05$, and * $p<0.1$ respectively using a two-tail test.

Table 8 provides the robustness check output, which is extracted from the same dataset and designed in the time-lag model. As seen in Table 8, the association of the independent variables with the dependent variable is mainly dominated by positive and significant results ($p < 0.01$). Recall back to the evidence from panel data analysis and sensitivity analysis, the statistical outputs using one-quarter time-lag variables suggest consistent results. $CSRperf_{i,t-1}$, $SIZE_{i,t-1}$, $LEVERAGE_{i,t-1}$, $PER_{i,t-1}$, $DY_{i,t-1}$, and $LNSP_{i,t-1}$ show positive signs. Whilst, an independent variable (PV) shows a conflicting sign which is negative and statistically significant. This result is also in line with the proposed hypotheses, where the notion of a negative association between $PV_{i,t-1}$, and SR is supported in two-tail analysis. A similar propensity could also be found when we account for the logit regression analysis by employing more lagged variables (see columns 2, 3, 4, and 5). We deliberately use the 2nd, 3rd, 4th, and 8th quarter lag data to see if the logit regression provides hold and robust results over time. The obtained empirical robustness checks show that the results remain consistent with the main analysis.

6. CONCLUSION REMARKS

This paper particularly examines the nexus of CSR performance, firm's attributes, and sustainability reporting. Overall, this study highlights the main factors that drive companies' decision to engage in sustainability reporting. We conjecture that CSR performance could be useful to understand better how depth and well companies' commitment to the sustainability-related issues. As empirically proven, CSR performance in contemporaneous or lagged independent variables has consistently shown a positive association with the probability of engaging with sustainability reporting in the Indonesian capital market. Additionally, the proxies of firm's attributes also suggest consistent signs in their relation to sustainability reporting.

In closing, the overall results generally suggest three main conclusions. First, CSR performance and firm's attributes are empirically proven as the associate factors in driving companies' decision to engage with sustainability reporting in Indonesia. Second, the nature of firm's attributes opens a clear-cut that companies with good economic performance or those who achieve a good equilibrium in the cost-and-benefit analysis are more likely to engage in sustainability reporting. Third, in line with the government's and standard setter's objectives in maintaining environmental sustainability, sustainability reporting is useful for controlling the sustainability of the environment and society where the companies are operating. Also, sustainability-related activities and its publication is deemed able to act as an organizational legitimacy tool.

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