Corporate Social Responsibility and Eco-Efficiency: Impact on Firm Value in The Indonesian Manufacturing Sector

Anisa Putri Mutiara Sicard, Nadia Talitha Salsabila Tanjung, Holly Deviarti
Accounting Department, School of Accounting
Bina Nusantara University
Jakarta, Indonesia, INA
Anisa.sicard@binus.ac.id, Nadia.tanjung@binus.ac.id, Bunda_mustafa@binus.ac.id

Abstract

Climate change is one of the most widely debated issues in the world because of the rise in greenhouse gas emissions during the industrial revolution. Corporations contribute to this to happen. They publish Social and Environmental Responsibility Report to indicate their responsibility to the environment. This study aims at exploring how Corporate Social Responsibility (CSR) reporting, carbon emissions disclosure, and eco-efficiency applications affect value of the corporation. Multiple linear regression analysis using SPSS 26 was to analyse the data. This study found that CSR has no relationship with firm value. Meanwhile, disclosure of carbon emissions substantially gives adverse impact on firm value. The same applies for eco-efficiency which reduces the firm value. These findings demonstrates that CSR, carbon emissions disclosure, and eco-efficiency have a significant negative effect on firm value computed by PBV. They evidently had little effect on especially the fluctuation of the company's stock price.

Keywords:
corporate social responsibility, carbon emission disclosure, eco-efficiency, firm value

1. Introduction
Climate change is one of the most debatable and controversial issues around the world. According to Berkeley Earth Monitoring Group, there are no indications for climate cooling in 2021 as human activities have been creating more heats (Tombeg, 2022). The rise of the earth temperature is most commonly due to higher emissions of greenhouse gases in the atmosphere since the industrial revolution which are caused by human activities such as combustion of fossil fuels that emits carbon dioxide. The industrial revolution had affected accounting in particularly reporting (Rusmana & Purnaman, 2020). Even though primary goal of a company is to generate profit, it must nevertheless use its resources effectively. According to Limited Company Law No. 40, Article 74 of 2007, Indonesian firms that depend on natural resources for their activities must be aware of the environment conservation and be socially responsible. The success of the corporate social and environmental responsibility programmes are not indicated by their execution only but also by their communication. When communication of the company Corporate Social Responsibility (CSR) meets or surpasses customers' expectations, the company can reap more advantages from its CSR initiatives (Kim & Ferguson 2018). Moreover, to minimize the environmental effect of the production wastes, the company must ensure that the wastes give insignificant impact to the environment. Eco-efficiency concept is thus considerably appropriate for a company to manage its wastes.

Company annual report containing company's long-term commitment, performance of the year, and other achievements serves as a mean of communication to the investors and the shareholders as well as an evaluation for prospective investors who want to invest in the company. According to the study of Utomo, Rahayu, Kaujan, and Irwandi (2020), the environmental performance has a favourable influence on environmental disclosure and firm value. Nevertheless, environmental disclosure has evidently no impact on firm value and does not change the impact of environmental performance on firm value. As the consequence, CSR disclosure and its components such as efficient waste management and carbon emission control have an impact on firm value. Although no regulation specifies which components of CSR should be reported, company can have additional value from the investors and stakeholders by implementing CSR. Companies operating in particularly manufacturing industry must have CSR report from which investors and stakeholders can recognize how seriously they take their environmental and social responsibilities. In

Indonesia, CSR disclosure is a mandatory for companies planning to go public or for the public ones. Since many companies are not yet listed on the Indonesian Stock Exchange, they very rarely disclose their CSR which is in fact voluntary. The paper is outlined in four sections. First, a review on previous research addressing CSR and eco-efficiency that are pertinent to this study are presented. Second, theoretical thoughts focusing on the relationship between CSR disclosures on carbon emissions management and its components, such as effective waste management that importantly impacts firm value, are outlined. Third, the databases used to collect data on each variable are discussed. The empirical analysis of the findings is presented in the final section.

2. Literature Review

Dowling and Pfeffer (1975) introduced the theory of legitimacy in an article entitled Organizational Legitimacy: Social Values and Organizational Behaviour. They termed legitimacy as a form of a social contract between corporate and society in mutual interrelationships. Deegan and Unerman (2006) stated that the theory of legitimacy refers to companies that continuously ensure their activities are acceptable according to the boundaries and norms of the society. By doing this, they are actually convincing external entities to admit their activities. The theory of legitimacy emphasizes that organizations should pay attention not only to the rights of investors but also to those of the public (Ratmono & Juliarto 2019). On the other side, institutional theory gives expectation on how organizations can embrace sustainability (Meyer & Rowan 1977; Zucker 1987). Disclosing CSR undertaken by a company in its annual report can possibly be seen as an attempt to satisfy expectations of the society on the company. Gray, Kouhy, and Lavers (1995) defined CSR disclosure as a process of disclosing information for showing company social accountability. This considerably gives an impact on the company's worth. Recently external parties - stakeholders, the society, economic analysts, and potential investors - have learnt company's carbon performance through its voluntary disclosure. The credit (or penalty) awarded by the parties to a company based on its carbon performance in turn affects firm value (Datt et al. 2019).

Institutional theory can be used to explain how changes in social values, technological advances, and regulations influence decisions on sustainable green activities (Ball & Craig 2010; Lounsbury 1997; Rivera 2004). However, theory of legitimacy argues that a company can be a sustainable corporation if the community accepts its existence and activities which comply with the community value system. Community acceptance and good reputation in the public are believed to improve the company's worth which can indirectly boost the company's earnings. Disclosing information of the company carbon emission has an important role since it can identify carbon footprint resulted by the company and attempts to decrease the footprint in each production. The higher the level of GHG emissions disclosure, the higher the value of the company (Gabrielle & Toly 2019). This can be the basis for the existing and potential investors to make investments decisions.

The Effect of Corporate Sustainability Report on Firm Value

Perspective on CSR depends on company goals which include sustainable management and contributions to the society that become the source of profit (Hizam et al. 2019). According to Limited Company Law No. 40 of 2007, CSR is typically functioned as a form of corporate responsibility towards parties that are directly or indirectly involved and impacted by the company's actions, there has been no official regulation in Indonesia regarding to reporting business activities that relate to the environmental issues. However, there is an international standards called the Global Reporting Initiative (GRI) that can assist governments and businesses in communicating their business impacts on climate change, human rights, and corruption. Corporate Social Responsibility reporting initiated by the GRI is referred to as Sustainability Report developed from the concept of Sustainability Development. Corporate Social Responsibility is measured by dividing the company's total net profit by 91 indicators of the GRI-G4. The performance indicators in the GRI-G4 are classified into three main categories: economic, environmental, social, and labour practices; work comfort, human rights, community; and responsibility to product (Sopian & Mulya 2018).

The rationale of institutional theory is that an organization must be able to convince the public that it is a legitimate entity and deserved for supports (Meyer & Rowan 1977). In line with the theory of legitimacy, an institution can engage in CSR activities and report them for maintaining, gaining, and regaining their legitimacy (Fernando & Lawrence, 2014). Consequently, the desire to legitimise an organization's operations through CSR disclosure is a predictable motivation driving disclosure-related decisions (Deegan 2002). According to legitimacy theory, there is a "social contract" between commercial entities and their respective societies (Deegan 2006; Deegan & Samkin 2013). This social contract relates to whether or not an organisation acts within the society's boundaries, conventions, or expectations. As a result, CSR programmes are developed not merely to meet the legal requirements but also to capture

and affect investors' opinions that economically benefit the firm and that will be reflected in the firm's value (Deswanto & Siregar 2018).

Studies found that CSR disclosure gives a positive and significant impact on firm value. The study of Chung et al (2018) found that CSR activities influence firm value since they are considerably necessary for having positive evaluation from the market. According to Tsang et al (2020), there is a positive relationship between CSR performance and future firm value regardless of how the CSR performance is defined using CSR ranking from the KLD data base. Referring to the research of Wirawan, Falah, Kusumadewi, Adhariani, and Djakman (2020) indicating that CSR disclosure can increase firm value, the descriptive analysis results in the fact that the CSR disclosure by Indonesian manufacturing companies was on average still low. Firm value is substantially related to CSR, institutional shares ownership, and company size (Chen & Lee 2017). This demonstrates that boosting CSR spending has various advantages such as to increase institutional shareholder ratios and to grow size of the company which then influence the growth of profit and of firm value. Success of a company is often related to stock price that in turn affects value of the company. Price-to-book (PBV) ratio can be used to know a company's stock price as cheap or expensive. The PBV ratio allows investors to recognize if company shares are worthy for investing or not and also describes conditions of the firm that can affect the firm's value. According to Dewi and Monalisa (2016), CSR disclosure does not significantly impact the firm value calculated with the PBV proxy. Mai (2017) also concluded that CSR does not impact PBV.

H1: CSR disclosure has a significant positive effect on firm value

2.1 Carbon Emission Disclosure and Firm Value

Naturally, carbon emission and greenhouse gases are needed by the atmosphere to keep the earth surface warm. Considering that greenhouse gas traps heat, gas concentration in the atmosphere higher along with more trapped solar thermal in the atmosphere. This causes temperature on the earth surface increases which in turn leads to climate changes indicated with unpredictable weather, ecosystem extinction, and reduction of water sources for about 10% to 30% in the sub-tropical and tropical areas. It can be stated that climate change on the earth endangers sustainability of the global ecosystem.

According to Ongsakul and Sen (2019), climate change is mainly caused by carbon emission produced by businesses. Significant carbon emissions contributes potentially to climate change. Moreover, manufacture that is considerably the base of a national economy is evidently the biggest contributor in energy consumption and to CO2 ((Wei et al. 2019); (Xu & Lin 2017). Carbon emission disclosure is necessary for managing the industrial emissions. It can be presented in the annual report or the sustainability report of the company. Such disclosure can be either voluntary (such as greenhouse gas (GHG) and CDP protocols) or mandatory (such as EU Emissions Trading (Velte et al. 2020). The institutional theory emphasizes that an organisation is not only driven by its profit motives but also by requirements of other institutions such as CDP, institutional investors, or governmental (Hahn, Reimsbach, and Schiemann 2015). Furthermore, the theory of legitimacy stresses that an organization is expected to operate in the scope of social values for it to sustain in the future (Deegan & Rankin 1997). It thus can be concluded that implicitly there is a social contract between an organization and its community, in which the organization's social concerns directs to disclosure of relevant information to meet the community expectation (Cormier et al. 2005; Deephouse, 1996; Solomon & Lewis, 2002). As carbon emission control is the basic aspect in ensuring sustainability of a business, companies can thus develop organizational structure enabling them to control carbon emission, to analyse carbon emission risks, and to handle carbon emission related problems (Kurnia et al . 2020). Companies are more likely to adopt environmental responsibility as public awareness of environmental issues grows (Kılıç & Kuzey 2019).

Previous research on the influence of carbon emission disclosure on firm value ended up with inconclusive results. Hardiyansah et al (2021) concluded that carbon emission disclosure affects positively and significantly on the firm value. Companies that are more environmentally conscientious attract investors who want to invest in high-profile industry. The study of Yan, Li, Huang, and Li (2020) also found that carbon performance consistency and carbon information disclosure improve goodwill. Such influence is more apparent on non-state and strong governance companies. Other studies (Alifiani & Suryaningrum 2020); Lee et al. 2021) concluded that carbon emission disclosure can increase firm value since voluntary disclosure can motivate investors to invest in the company that can then leverage firm value.

On the contrary, the result of Muhammad and Aryani (2021) indicates that carbon disclosure reduces firm value. Similarly, Lee, Park, and Klassen (2015) revealed that carbon information disclosure on CDP has considerable negative impact on capital market returns. This indicates that investors consider the disclosure as bad news and ponder that costs to deal with global warming is higher than the benefits (Hsu & Wang, 2013). Matsumura, Prakash, and Vera-munoz (2014) also found a negative relationship between carbon emission and firm value under the consideration that the capital market penalizes a company for carbon emission it produces.

H2: Carbon emission disclosure has a significant positive effect on firm value.

2.2 Waste management and firm value

According to the environmental dictionary and the Indonesian Ministry of Environment, eco-efficiency is a concept of efficiency on natural resources and energy that minimize the use of raw materials, energy, and negative impact to the environment. It is viewed as company's attempt to manage the environment for reducing the impacts of environmental damages while improving economic growth. Growing concerns of the public on the environment directs companies to focus not only on profit but also on community and environment. In line with the theory of legitimacy, a company that can minimalize the negative impacts it produces on the environment and can give information to the public will experience higher legitimacy from the public. Institutional ecological economics provides a reference for design, implementation, and effectiveness of the solutions of environmental governance (Norgaard 2004). According to the institutional theory, implementation of eco-efficiency needs a management system that assists in solving problems that have not yet been regulated, for example resources and energy usage, climate change mitigation and adaptation as covered in ISO 14001, which is a certification on environmental management system containing standard requirements and guidance. A company having ISO 14001 certificate indicates its commitment to continuously restore the environmental performance.

Inconsistency results of research on waste management implementing eco-efficiency and firm value exists. The research of Kurnianta and Dianawati (2021) and Satrio and Kunto (2020) found that eco-efficiency measured with ISO 14001 certification significantly influence firm value. This gives evidence that a company practicing eco-efficiency has higher firm value compared to those that do not do so. On the other hand, Safitri, Lindrianasari, and Gamayuni (2019) found that eco-efficiency has a negative and negligible effect on firm value. Putri (2019) also found negative relationship between eco-efficiency and firm value resulted from the implementation of eco-efficiency that potentially can reduce value of the corporation. Safitri and Nani (2021) added that eco-efficiency proxyed with ownership of the environment management with ISO 14001 certification has a favourable and considerable influence on financial performance of the company but has no direct relationship with firm value (Safitri & Nani 2021).

H3: Application of eco-efficiency has a significant positive effect on firm value

3. Methods

This study used non-probability sampling with an intentional procedure based on pre-set criteria. The criteria are manufacture companies listed on the Indonesian Stock Exchange (IDX), have annual report for the year of 2017-2020, and present their financial report in other than IDR. The data of 55 manufacture companies are secondary data gathered indirectly from annual report or sustainability report of the companies available on the official website of the Indonesian Stock Exchange and of the companies. Each variable is measured using particular measurement. The variable Y, firm value, is measured using price to book value (PBV) ratio. Measurement of the variable Xs are respectively CSR measured using GRI 4.0, carbon emission disclosure portrayed using Carbon Disclosure Project (CDP), and eco-efficiency predicted using dummy variable on availability of ISO 14001 certification owned by the company. The data was analysed using multiple linear regression analysis with SPSS 26.

4. Result and Discussion

Prior to linear regression analysis, classical assumption tests covering normality test, multicollinearity test, autocorrelation test, and heteroscedasticity test were conducted. In the next step, hypothesis test using t test and F test as well as coefficient of determination were run.

Classical Assumption Test

The normality test presented in table 1 resulted in significance of 0.068 which is bigger than 0.05. This indicates that the residuals are normally distributed or fits the normality criteria. The result of multicollinearity test are indicated by tolerance and VIF. The results presented in Table 1 shows that there are no tolerance value less than 0.10 and thus indicate that there are no relationship between the independent variables with a value greater than 95%. The VIF value also indicates that all independent variables of CSR (X1), carbon emission disclosure (X2), and eco-efficiency (X3) show no multicollinearity. The heteroscedasticity test resulted in the significance of CSR is 0.297, carbon emission disclosure is 0.869, and eco-efficiency is 0.923. Since the significance values are all bigger than 0.05, it is concluded that there is no heteroscedasticity between the independent variables in the regression model. As seen in table 1, the value of DW for the autocorrelation test is 1.797. With 5% confidence level and N amounted of 112, the test results DL 1.6187 and DU 1.766, and thus the value of 4-DL = 2.382 and 4-DU = 2.234. Since the DW value falls between DU and (4-DU) or (DU < DW < 4-DU), it can thus be concluded that there is no autocorrelation in the regression model.

Table 1. Classical Assumption Tests

Description	Result	
Normality Test	Sig. (2-tailed)	.068
Multicollinearity Test	Tolerance	VIF
CSR	.696	1.650
Carbon Emission Disclosure	.601	1.664
Eco-efficiency	.973	1.028
Heteroscedasticity Test	Sig. (2-tailed)	
CSR	.297	
Carbon Emission Disclosure	.869	
Eco-efficiency	.923	
Autocorrelation Test	R^2 .815	DW 1.797

Hypothesis Test

F test results in 0.771 and the significance of 0.513 (table 2), since the significance value is bigger than 0.05, it can be concluded that the independent variables (CSR, Carbon Emission Disclosure, dan Eco-efficiency) have no concurrent effect the dependent variable (firm value).

Table 2 also presents the result of t test analysing the effect of the independent variable partially on the dependent variable. The t test on the hypothesis 1 stating that corporate social responsibility (CSR) influences firm value results in the significance of 0.193 > 0.05 or computed t value of 1.309 < t table 1.982. The data also reveal that based on the table GRI 4.0 as much as 24%-25% manufacture companies in Indonesia disclose their CSR activities. This low disclosure of GRI 4.0 is possibly caused by the number of companies that had not yet disclosed in detail each indicator in GRI 4.0 which contain information on the 91 GRI items. The information on CSR is disclosed briefly in the company's annual report and this results in inappropriate disclosure of CSR report. Consequently, investors cannot use it as their basis in making an investment decision and it influences the computation of the GRI value. In relation to the hypothesis 2 implying the effect of carbon emission disclosure on firm value, the significance of t test results in 0.747 > 0.05 and computed t value -0.323 < t table 1.982. The sample data show that only 13 companies published carbon emission in their annual reports. The significance value of the hypothesis 3 stating the influence of eco-efficiency on firm value is 0.787. This indicates that the estimated t value -0,271 < t table 1.982 and significance 0.787 > 0.05.

Ultimately, the coefficient of determination presented in table 2 is 0.021. This means that the independent variables (CSR, carbon emission disclosure, dan eco-efficiency) in the regression model explain changes in the dependent variable (firm value) as much as 2.1% only.

Table 2. The Result of Hypothesis Test

	B	T	Sig	Description
F-test			.513	
t-test				
(Constant)	1.331	3.572	.001	
CSR	1.248	1.309	.193	Positive but Not Significant
Carbon Emission Disclosure	-0,151	-0,323	.747	Negative Significant
Eco-Efficiency	-0,13	-0,271	.787	Negative Significant
Adjusted R^2			.021	

Discussion

The results show that hypothesis 1, 2, and 3 are rejected. According to the hypothesis 1, CSR disclosure has a positive but not significant effect on firm value. This result is in line with the previous studies (Kusumayanti & Astika 2016; Cristomo 2011) stating that CSR does not have effect on firm value because elaboration the content of the report is not yet clear enough. The reason for this is possibly there is no program or agreement on standards for CSR implementation and as a consequence CSR is implemented in a different way by each company (Rumambi & Lintong 2017). In addition, the research of Dewi and Monalisa (2016) and Mai (2017) found that CSR disclosure does not have a significant influence on firm value calculated using the PBV proxy. Referring to the institutional theory, the results of this study show that no relationship between CSR disclosure and firm value because the implementation of CSR is stimulated by obligations induced by the government.

Brammer, Jackson, and Matten (2012) noted that according to the institutional theory it is better to put CSR explicitly in a broader area of economic governance characterized by different modes of market, regulation, and state, rather than viewing it purely as a voluntary action. Company finance is conventionally to maximize value. This implies that company is responsible only to the stakeholders whose interest is to maximize value and not to other entities whose interest is community welfare (Friedman 1980). The results however do not support the theory of legitimacy since the disclosures by the companies are still far from the predetermined standards and are inconsistent in reporting social responsibility in each period (Sabatini & Sudana 2019).The theory of legitimacy focuses on attempts to get public legitimacy by conducting voluntary disclosure. Nevertheless, in Indonesia CSR report has not yet been viewed as necessary for making investment decision.

The result in testing the hypothesis 2, carbon emission disclosure has a significant negative effect on firm value supports the previous research of Muhammad and Aryani (2021) indicating that carbon disclosure harms firm value. Lee, Park, Klassen (2015); Matsumura, Prakash, and Vera-munoz (2014) also found that the disclosure of carbon information has a significant adverse effect on the capital market as the capital market penalizes companies for the carbon emissions they produce. Grauel and Gotthardt (2016) found that national environmental regulation and context dictate large corporations to do voluntary carbon reporting. This is consistent with the institutional theory, in which government regulation on carbon emission disclosure is still inadequate in Indonesia. Mallin (2007) emphasized that non-disclosing can result in bias and fail in organizational disclosure obligations. Organizations must adapt to the changing business disclosure requirements to ensure that adequate information is provided to the stakeholders. On the other hand, according to the theory of legitimacy, a company discloses its carbon emission to gain public legitimacy and to restore its company image. This however does not support this research. Carbon footprint is still less common and companies with a lot of assets are not necessarily able to provide extensive carbon emission disclosure. This then affects value of the company. Since carbon emission reduction and disclosure are not understood by many companies, they considerably do not have effect on firm value in particularly stock price (Astiti & Wirawa, 2020)

The test on hypothesis 3 concluded that the application of eco-efficiency has a significant negative effect on firm value. The result is in line with the previous research (Putri, 2019; Safitri, Lindrianasari, and Gamayuni, 2019) stating that negative effect of eco-efficiency on firm value resulted from the implementation of eco-efficiency can lower value

of the company. Moreover, Safitri and Nani (2021) added that eco-efficiency proxied with ownership of environmental management and ISO 14001 certification has no direct relationship with firm value. Referring to the institutional theory stating that even though eco-efficiency is an acceptable industrial solution, relying on eco-efficiency to build green earth is not strategy for success in the long term since its orientation is economic (Chen et al. 2008). Thus ISO 14001 certificate does not guarantee a company has an efficient environmental management system in managing the wastes. As comparison, theory of legitimacy states that ISO 14001 is intended to have legitimacy from the stakeholders.

5. Conclusion

The study focusing on manufacture companies listed on the Indonesian Stock Exchange demonstrates that according to the first hypothesis, the company CSR disclosure has a positive but not significant effect on the firm value. The second hypothesis demonstrates that disclosing carbon emissions has a negative and considerable impact on firm value. Finally, the third hypothesis demonstrates that the company eco-efficiency has a negative and considerable influence on its value. Thus, the three independent variables under consideration do not influence the firm value in especially the fluctuation of the company's imminent share price. It means that implementing and disclosing CSR, disclosing carbon emissions, and promoting eco-efficiency do not boost value of Indonesian manufacturing enterprises. This can be a significant contribution for especially deciding share prices. Research on firm value varies in their results depending on proxies or indicators utilised to quantify the variables. This study has small sample size since it used only manufacturing in the industrial sector. Thus, future research can widen the business sectors by adding either other sectors listed on the Indonesian Stock Exchange or other companies operating outside the Southeast Asia. Furthermore, the criteria utilised in this study in processing sample data possibly had impact on the outcomes. Future studies may widen the criterion.

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Biographies

Anisa Putri Mutiara Sicard is an undergraduate student in Bina Nusantara University majoring in accounting with specialization in managerial accounting. She participates actively in the national and international seminars organized by the campus. This is her and her colleagues' first article.

Nadia Talitha Salsabila Tanjung is an undergraduate student in Bina Nusantara University majoring in accounting with specialization in managerial accounting. She actively participate in the international and national seminars organized by the campus. This is her and her colleagues' first article.

Holly Deviarti, S.E., M.B.A is a senior lecturer of management accounting in Bina Nusantara University. She received her PhD in Budgetary Control from Putra Business School. Her research interests are cost management, cost quality, sustainability, cost control, Just in Time.