THE EFFECT OF CIRCULAR ECONOMY AND ENVIRONMENTAL PERFORMANCE ON CORPORATE WASTE DISCLOSURE

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Abstrak

Background: Environmental issues caused by the impact of waste are currently a major concern for people around the world. The growing human population every year is the main cause of the increase in waste generation. Waste generation from companies' operational activities has also received attention from the world community, so corporate social environmental responsibility is very important to communicate. The United Nations Sustainable Development Goals raised this issue in the 12th SDG's topic of "Responsible Consumption and Production".
Objective: This study aims to examine the effect of circular economy and environmental performance on corporate waste disclosure, with financial performance, company size, and company value as control variables.
Research Methods: This research is a quantitative study that focuses on manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2021-2023 period. The method used in this research is multiple linear regression analysis.
Research Results: The results showed that the circular economy and environmental performance has a positive and significant effect on corporate waste disclosure. This study concludes that companies that are committed to circular economy practices and have good environmental performance tend to make more transparent waste disclosures. The results of this study also found that the control variables of financial performance and firm value do not have a significant effect, while the control variable of firm size has a significant effect.
Originality/Novelty of Research: This study provides new insight by using Social Return On Investment (SROI) as a measurement of environmental performance and incorporating the effect of circular economy on corporate waste disclosure.
Keywords: Circular Economy, Environmental Performance, Corporate Waste Disclosure

Introduction

The global waste problem has reached alarming levels, with annual production exceeding 2 billion metric tons (UNEP, 2024). The industrial sector contributes significantly to this problem, particularly through hazardous and toxic waste that has systemic impacts on ecosystems and public health (Adyana and Gantyowati, 2023; Alberca and Parte, 2024). The Indonesian context shows particular urgency with an 81.8% surge in manufacturing hazardous waste production (BPS, 2023) and rampant cases of illegal dumping (Assifa, 2022). In 2022, a site in Purwakarta planned as a 3R (Reduce, Reuse, Recycle) waste treatment site was instead used for illegal dumping and burning of factory waste (Assifa, 2022). The smoke

from burning waste can cause pollution and impact the health of neighboring residents. These facts indicate a gap between industrial waste management practices and the need for environmental transparency and accountability.

To address the issue of industrial waste, the concept of circular economy emerges as a potential solution through a closed system approach that can help minimize waste generation (McGrath and Jonker, 2024). However, previous research shows that the implementation of circular economy is often not accompanied by adequate disclosure (Dagiliene et al., 2020), raising questions about its effectiveness in improving environmental transparency. This transparency issue is even more complex given that existing environmental performance measurement tools such as PROPER are considered to have limitations in comprehensively capturing environmental impacts (Sagala and Aprilia, 2023). The development of new metrics such as Social Return on Investment (SROI) is an urgent need to provide a more complete assessment of the environmental performance of companies.

This study analyses the influence of circular economy and environmental performance on corporate waste disclosure using legitimacy theory (Deegan, 2014) and triple bottom line (Elkington, 1998) as theoretical foundations. Legitimacy theory (Deegan, 2014) explains that companies will seek to gain social legitimacy through the disclosure of practices that are aligned with stakeholders' expectations, including in terms of waste management. The implementation of a circular economy and good environmental performance provide a substantive basis for companies to make more comprehensive waste disclosures, while building an image as an environmentally responsible entity.

The triple bottom line concept (Elkington, 1998) reinforces this framework by emphasizing that circular economy and environmental performance measurement should not only look at ecological aspects, but also at economic and social impacts. Circular economy creates value through resource efficiency (economic aspect), while reducing the negative impact of waste on society (social aspect). Meanwhile, SROI as an environmental performance measurement tool is able to quantify this multidimensional value, thus providing incentives for companies to be more transparent in disclosing their waste management.

This study aims to examine these two key factors, namely the implementation of circular economy and the measurement of environmental performance through SROI, and by considering various control variables such as firm size, firm value, and financial performance. SROI ensures that the impact and value created from a company's environmental and social activities are well articulated in the company's sustainability information (Kim and Ji, 2020). In previous studies, researchers tended to observe environmental disclosure in a broad sense (Acar and Temiz, 2020; Opferkuch, Caeiro, Salomone, and Ramos, 2022; Fatimah, Kannan, Govindan, and Hasibuan, 2023). Research on more specific environmental disclosures such as waste disclosure remains rare. This study focuses on manufacturing companies in

Indonesia over the period 2021-2023 listed on the Indonesia Stock Exchange, considering that this sector is a major contributor to industrial waste as well as having significant environmental impacts.

This study is expected to broaden the knowledge of academics and deepen theoretical understanding of the influence of the circular economy and environmental performance on corporate waste disclosure. The results of this study are also expected to serve as material for evaluating the implementation of circular economy practices and environmental performance on the quality and transparency of corporate waste disclosure in Indonesia, so that companies can assess areas that need improvement in their corporate waste management efforts. Referring to the information previously described, the following research question was prepared (1) Does the circular economy affect corporate waste disclosure? (2) Does environmental performance affect corporate waste disclosure?

Literature Review

Legitimacy theory (Deegan, 2014) provides a framework for understanding why companies are motivated to disclose their waste management. This theory argues that companies need to gain and maintain social legitimacy by adjusting their operations to the expectations of stakeholders. In the context of industrial waste, public pressure for responsible environmental practices (Adyana and Gantyowati, 2023) forces companies to increase transparency through waste disclosure. This disclosure serves as a strategic communication tool to demonstrate alignment between company operations and evolving social norms, while reducing the legitimacy gap between societal expectations and actual company performance.

The triple bottom line (Elkington, 1998) enriches this perspective by emphasising that corporate sustainability should consider three pillars: profit, people, and planet. In waste management, this concept explains how the circular economy creates value across all three dimensions - improving economic efficiency (profit), reducing public health impacts (people), and minimising environmental degradation (planet). Measuring environmental performance through SROI becomes a crucial instrument as it is able to quantify this multidimensional value, providing an objective basis for more comprehensive waste disclosure (Kim and Ji, 2020). The integration of these three aspects results in disclosures that not only fulfil legitimacy demands but also reflect sustainable value creation.

The circular economy acts as an operational mechanism that connects theory with practice. It transforms the traditional linear production system into a closed cycle through the reduce-reuse-recycle principle (McGrath and Jonker, 2024). The circular economy is still a new term, but the concept underlying the circular economy has been discussed in Boulding's (1966) essay known as the ‘spaceman economy’. The circular economy concept was created to replace the traditional take-make-dispose economic model,

i.e. the linear economy. In the context of waste disclosure, the implementation of circular economy provides two strategic advantages: (1) it reduces the volume of waste to be disclosed, and (2) it provides specific material on waste management innovations that can improve the quality of disclosure (Dagiliene et al., 2020). Thus, the circular economy not only solves environmental problems but also strengthens the material basis for meaningful disclosure.

Villiers, Dumay, Farneti, Jia, and Li (2024) explain that how well a company manages and reduces the impact of its activities on the environment will be reflected in its environmental performance, which can cover various aspects, such as resource management, waste management, and other environmental impacts as a whole. Environmental performance measured through SROI offers a revolutionary approach in evaluating waste management impacts. In contrast to PROPER which is limited to qualitative assessment (Sagala and Aprilia, 2023), SROI converts socio-environmental impacts into monetary values, enabling more rigorous cost-benefit analysis (Nicholls et al., 2012). This metric is particularly relevant for waste disclosure as it can quantify indirect benefits such as water pollution prevention or emission reduction, which are difficult to measure with conventional instruments.

Corporate waste disclosure in this study refers to the presentation of voluntary information on waste management policies, systems and performance according to the GRI 306 standard (Global Reporting Initiative, 2022). Reporting standards such as GRI 306 provide a framework for disclosing key aspects of waste management, ranging from waste volumes to their environmental impacts. In accounting terms, this disclosure is an application of the principle of full disclosure (Kieso et al., 2020) as an obligation to present all material information that can affect the decision making of users of financial statements. Suwardjono (2005) describes voluntary disclosure in which a company provides information beyond the mandatory provisions of accounting standards. AA1000AP (2018) emphasises the importance of the materiality principle in determining waste information that needs to be disclosed based on the significance of its impact on stakeholders. Legitimacy theory explains companies' motivation in making these disclosures as a response to social pressure, while the triple bottom line emphasises the importance of presenting economic, social and environmental impacts in a balanced manner. In the context of a circular economy, waste disclosure becomes a medium to communicate innovations in reducing and utilising waste more effectively.

The implementation of circular economy in operational activities is not merely a corporate strategy for economic benefits alone. At its core, from environmental and social perspectives, the circular economy model aims to reduce waste generation and its impacts (Henriques and Richardson, 2007). The triple bottom line concept explains that, from social and environmental aspects, circular economy practices can serve as a means to demonstrate corporate commitment and responsibility, communicated through waste disclosure (Savitz and Weber, 2006). Meanwhile, circular economy practices can also address legitimacy gaps by

enabling companies to exceed societal expectations. Companies continually strive to gain public support and legitimacy to remain sustainable, making increasingly transparent waste disclosure an important tool for enhancing corporate image (Deegan, 2014).

The adoption of circular economy principles can enhance the transparency of corporate waste disclosure. Research by Dagiliene et al. (2020) demonstrates that companies adopting sustainability reporting frameworks tend to disclose circular economy information in their environmental reports. However, Saizarbitoria et al. (2023) found that companies often mention circular economy concepts in environmental disclosures without comprehensive implementation, using them primarily as impression management strategies to improve corporate image without substantive action. It can be concluded that more comprehensive implementation of circular economy principles can help companies maximize waste utilization (Vega and Rodriguez, 2024) and encourage more transparent communication of waste management information. Based on these arguments, the following hypothesis is proposed:

H1: Circular economy has a positive effect on corporate waste disclosure.

A company's commitment to minimizing its environmental impact is reflected in its environmental performance (Villiers et al., 2024). Legitimacy theory (Deegan, 2014) posits that companies continuously seek public approval to maintain their existence and access to resources. The triple bottom line concept emphasizes the importance of balancing its three core aspects—economic, social, and environmental—to ensure sustainability (Yip et al., 2023). Companies must meet societal expectations, including environmental responsibilities (such as proper waste management), making strong environmental performance critical for demonstrating sustainability commitments. Firms with a strong commitment to environmental management tend to be more transparent in waste disclosure, as they actively mitigate risks and address environmental impacts (Bowden et al., 2001).

Companies with good environmental performance enhances corporate waste disclosure transparency. Research by Acar and Temiz (2020) shows that companies with strong environmental performance are more likely to disclose comprehensive environmental data. Similarly, Adyana and Gantyowati (2023) found that firms with better environmental performance disclose more detailed waste management information, driven by proactive environmental strategies. These findings suggest that companies with strong environmental performance disclose more waste-related information to enhance their reputation and ensure long-term sustainability. Based on these arguments, the following hypothesis is proposed:

H2: Environmental performance has a positive effect on corporate waste disclosure.

Research Methods

The study utilizes quantitative data derived from secondary sources. The secondary data is collected from sustainability reports and annual reports of manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the period 2021-2023. These reports were obtained through the official IDX website (www.idx.co.id), company official websites, and additional web searches for supplementary information. The research population consists of manufacturing companies listed on the Indonesia Stock Exchange (IDX). The study employs purposive sampling with the following inclusion criteria; (1) Manufacturing companies listed on the IDX during the 2021-2023 period. (2) Manufacturing companies that consistently published annual reports and sustainability reports on their official websites throughout the 2021-2023 period. (3) Manufacturing companies that provided complete disclosure of required sustainability information in their reports for the entire 2021-2023 period.

The study employs a documentation technique utilizing sustainability reports, annual reports, and other relevant information from company websites and business news portals covering manufacturing firms listed on the Indonesia Stock Exchange (IDX) from 2021 to 2023. Data collection was conducted by downloading annual reports from the official IDX website (www.idx.co.id) and sustainability reports from company websites. Additional supporting information was obtained through supplementary web searches.

The dependent variable in this study is corporate waste disclosure. Waste disclosure refers to information regarding the environmental impact of waste and how companies manage this impact (Global Reporting Initiative, 2022). Waste is defined as unwanted byproducts or residues generated from consumption and production activities (Wicaksono et al., 2024). Waste disclosure is measured using the GRI 306: Waste 2020 disclosure indicators (Global Reporting Initiative, 2022). Appendix A show the required waste disclosure components according to GRI guidelines.

The measurement of waste disclosure is conducted using a checklist method where each disclosure item is assigned a score of "1" if it is included in the company's sustainability report and "0" if it is not disclosed. The total disclosure score is then calculated by dividing the number of items disclosed by the total number of applicable items.

$$\text{CWD } Score = \frac{\sum \text{CWD}}{\text{CWD total}}$$

Ewijk and Stegemann (2023) define circular economy as a sustainable development model that optimizes resource efficiency through closed-loop material cycles. Circular economy implementation is measured using 10 disclosure indicators adapted from Halbusi, Popa, Alshibani, and Acosta et al.'s (2024) research framework as shown in Appendix B.

The measurement of circular economy is conducted using a checklist method where each disclosure item is assigned a score of "1" if it is included in the company's sustainability report and "0" if it is not disclosed. The total disclosure score is then calculated by dividing the number of items disclosed by the total number of applicable items.

$$\text{CE } Score = \frac{\sum \text{CE}}{\text{CE total}}$$

Environmental performance reflects how effectively a company manages and mitigates the environmental impacts of its operations (Villiers et al., 2024). Social return on investment (SROI) is employed to assess environmental performance because it converts qualitative benefits (such as ecosystem preservation and resource conversion) into monetary values, providing a more comprehensive evaluation of sustainability initiatives' impacts (Scholten et al., 2006). The SROI formula is as follows (Nicholls et al., 2012):

$$\text{EP} = \frac{\text{Present Value of Social Impact}}{\text{Initial Investment}}$$

The SROI calculation process consists of five stages, (1) stakeholder identification, (2) impact mapping, (3) valuing outcomes, (4) establishing impact, (5) calculating SROI. Social value is derived through stages one to four, while the initial investment amount represents the total capital allocated by stakeholders (input) for all related activities. Appendix C show details of the SROI analysis framework.

Financial performance is how well the company manages its resources to generate optimal profits (Nirwana and Wedari, 2023). Financial performance is proxied by return on assets (ROA), return on equity (ROE), and net profit margin (NPM). Companies with good financial performance are often considered to have a greater responsibility to disclose waste, because they are considered capable of bearing the investment costs of managing waste (Adyana and Gantyowati, 2023). ROA is calculated by dividing net income (before extraordinary items) by the company's total assets (Acar and Temiz, 2020).

$$\text{FP\_1} = \frac{\text{Net Income}}{\text{Total Assets}}$$

ROE is calculated by dividing net income (before extraordinary items) by the company's total equity (Sandberg, Alnoor, and Tiberius, 2023).

$$\text{FP\_2} = \frac{\text{Net Income}}{\text{Total Equity}}$$

NPM is calculated by dividing net income (before extraordinary items) by the company's net sales (Sekhon and Kathuria, 2020).

$$FP\_3 = \frac{\text{Net Income}}{\text{Net Sales}}$$

Firm size is the scale of the size of a company (Utari and Aprilina, 2023). Larger firm sizes tend to be more exposed to external pressures and regulations, and have greater resources than small companies (Kartikasary, Wijanarko, Tihar, and Zaldin, 2023), so large firm sizes are more likely to disclose waste to maintain their reputation. Firm size is calculated by the natural logarithm of total assets (Kartikasary et al., 2023).

$$FS = \text{Ln (Total Assets)}$$

Firm value is the overall value of a company as reflected by market perceptions (Kim and Kim, 2024). Good corporate values tend to disclose more information in sustainability reports (Lee and Cho, 2021), especially corporate waste disclosure. Firm value is calculated using price book value (PBV). PBV is calculated by dividing the stock price divided by the stock book value (Harahap, Septiani, and Endri, 2020).

$$FV = \frac{\text{Stock Price}}{\text{Book Value}}$$

Hypothesis testing for this study uses the following equation:

$$CWD = \alpha + \beta_1 CE + \beta_2 EP + \beta_3 FP\_1 + \beta_4 FP\_2 + \beta_5 FP\_3 + \beta_6 FS + \beta_7 FV + \varepsilon$$

Description:
CWD = Corporate waste disclosure
α = Constant
β = Regression coefficient
CE = Circular economy
EP = Environmental performance
FP = Financial performance
FS = Firm size
FV = Firm value
ε = Standard error

The equation is applied for multiple linear regression, as well as using descriptive statistical analysis and hypothesis testing. Descriptive statistical research methods are used to describe raw data into concise and informative data including frequency, minimum value, maximum value, average value (mean), and standard deviation. multiple linear regression in hypothesis testing requires four stages of testing, namely normality test, classical assumption test, model feasibility test, and hypothesis testing.

Results and Discussion

The number of manufacturing companies listed on the Indonesian Stock Exchange in 2021-2023 is 165 companies. Based on the sample criteria, 32 companies have met the criteria. The observation period of the study was three years, so the total sample used in this study is 96 samples. The data used in this study are corporate waste disclosure (CWD), circular economy (CE), environmental performance (EP), financial performance (FP), firm size (FS), and firm value (FV). The results of descriptive statistics can be seen in Table 1 as follows.

Table 1. Descriptive Statistics

Variable	N	Minimum	Maximum	Average	Standar Deviation
CWD	96	0,063	1,000	0,377	0,252
CE	96	0,100	0,800	0,337	0,183
EP	96	0,075	24,147	5,241	4,967
FP_1	96	-0,282	0,313	0,072	0,096
FP_2	96	-0,624	0,862	0,108	0,192
FP_3	96	-1,408	0,328	0,063	0,186
FS	96	26,639	32,093	29,458	1,197
FV	96	-4,105	17,580	2,682	3,252

Source: Data processed (2025), Appendix D

The corporate waste disclosure variable (CWD) has a minimum value of 0.063, which indicates that the company's level of compliance with the 2020 GRI 306 standard is very low. This value is generated from the number of disclosure items as much as 1 out of 16 disclosure items in the 2020 GRI 306 standard on corporate waste. This shows that the company's waste disclosure is still very limited and does not meet the expected disclosure standards. The corporate waste disclosure variable (CWD) has a maximum value of 1,000 which indicates that the company discloses 16 out of 16 disclosure items in the 2020 GRI 306 standard on waste. This reflects the company's high transparency and commitment to responsible and sustainable waste management. The corporate waste disclosure variable (CWD) has an average value of 0.377 which indicates that on average companies disclose 5 to 6 out of 16 disclosure items in the 2020 GRI 306 standard on waste. Standard deviation shows how much the data spreads around the average. Table 1 shows that the standard deviation of CWD is smaller than the average CWD, which is 0.252. This indicates that the data variation is relatively small, meaning that most companies in the sample have a level of

disclosure that is not too far different from the average. In general, the level of corporate waste disclosure based on the GRI 306: Waste 2020 standard is still relatively low and limited, although there are still companies that can achieve full disclosure scores, most companies are still not fully transparent in disclosing information related to waste management. The small variation in disclosure levels between companies indicates that the majority of companies have similar disclosure patterns and have not optimally fulfilled the expected standards.

The circular economy variable (CE) has a minimum value of 0.100 which indicates that companies disclose 1 out of 10 circular economy disclosure items. This reflects a very low level of disclosure from the company. The circular economy variable (CE) has a maximum value of 0.800 which indicates that companies disclose 8 out of 10 circular economy disclosure items. This indicates that there are companies that are quite active in implementing and reporting circular economy practices even though they have not achieved full disclosure. The circular economy variable (CE) has an average value of 0.337 which indicates that on average companies disclose 3 out of 10 circular economy disclosure items. The standard deviation of CE is below the mean value, which is 0.183. This value indicates that the disclosure level of most companies is relatively not too far from the average disclosure of circular economy items. Based on the data presented in Table 1, the level of circular economy disclosure in the companies studied is still quite low on average, although there are some companies that disclose FS to 8 out of 10 circular economy disclosure items. Most companies still fall below 50% of the total circular economy items disclosed.

The environmental performance variable (EP) has a minimum value of 0.075, which shows that the company's total PV is Rp639,482,896,614.16 with a total investment value of Rp8,479,292,232,880. The investment value that is greater than the total PV reflects the company's less effective investment in improving the company's environmental performance. The environmental performance variable (EP) has a maximum value of 24.147 which shows the company's total PV is Rp78,737,495,367,493.70 with a total investment value of Rp3,260,712,000,000. The company's investment value which is much smaller than the company with the lowest environmental performance shows that the company has succeeded in achieving high environmental performance. The environmental performance variable (EP) has an average value of 5.241 with a standard deviation of 4.967. The standard deviation which is smaller than the average value indicates that the spread of the company's environmental performance data is not too far from the average. This means that despite the variation, most companies have environmental performance values that are not far from the average. Corporate environmental performance shows a wide variation between the lowest and highest values. Some companies have managed to achieve high environmental performance with more efficient investments, while others have not shown optimal results. This reflects the large differences in the effectiveness and outcomes of environmental investments between companies.

The financial performance (FP) control variable is divided into three measures, namely the ROA ratio (FP_1), ROE ratio (FP_2), and FVM ratio (FP_3). The minimum FP_1 value is -0.282 resulting from a net loss of Rp1,943,362,438,396, and total assets of Rp6,882,077,282,159. The large loss compared to the total assets owned by the company, reflects the very low and detrimental efficiency of the company's asset management. The maximum FP_1 value is 0.313 resulting from a net profit of Rp1,066,467,000,000 and total assets of Rp3,407,442,000,000. The net profit generated by the company compared to the total assets owned by the company reflects efficient and profitable asset management. The average value of FP_1 of 0.072 indicates that manufacturing companies generally manage their assets efficiently, although there is considerable variation as shown by the standard deviation of FP_1 which is greater than the average of 0.096.

The minimum FP_2 value is -0.624 which is obtained from a net loss of Rp950,288,973,938 and total equity of Rp1,533,820,300,426. The net loss generated by the company compared to the total equity owned by the company shows inefficient equity management. The maximum FP_2 value is 0.862 with a net profit of Rp924,906,000,000 and total equity of Rp1,073,275,000,000. The net profit generated by the company compared to the total equity owned by the company shows efficient equity management. The average value of FP_2 is 0.108, which indicates that companies can generally manage company equity well with a fairly high variation between companies. This variation is indicated by the standard deviation of FP_2 which is greater than the average, which is 0.192.

The minimum value of FP_3 is -1.408 which is obtained from a net loss of Rp1,943,362,438,396 and net sales of Rp1,380,071,332,830. The net loss generated by the company reflects the company's less effective cost management in generating higher profits than the company's revenue. The maximum FP_3 value is 0.328 which is obtained from net profit of Rp675,769,677,491 and net sales of Rp2,062,171,056,660. The net profit generated by the company reflects the company's effectiveness in reducing company costs. The average value of FP_3 of 0.063 indicates that manufacturing companies can generally generate profits, although some companies experience losses with considerable data variation. The data variation is shown by the standard deviation of FP_3 which is greater than the average, which is 0.186.

The minimum value of the company size control variable (FS) is 26.639 with total assets of Rp370,684,311,428 which indicates that the company has smaller total assets than other manufacturing companies in the sample. The maximum value of FS is 32.093 with total assets of Rp86,681,524,428,000 which indicates that the company has larger total assets than other manufacturing companies in the sample. The average value of FS is 29.458, with a standard deviation of FS much smaller than the average, which

is 1.197, which means that most companies in the sample have a relatively consistent company size and are not too far different from the average.

The minimum value of the firm value control variable (FV) is -4.105 obtained from a share price of Rp50 and a book value of shares of Rp12. A low share price and a negative book value of shares indicate a poor market valuation of the company. The maximum value of FV is 17,580 obtained from a share price of Rp8,950 and a book value of Rp509. A high share price and positive book value indicate a very favourable market perception of the company. The mean value of FV is 2.682, with a standard deviation of FV of 3.252 showing considerable variation. Some manufacturing companies have negative valuations due to low share prices and negative book values, and some other manufacturing companies have positive market valuations. The large variation indicates the diverse conditions and fundamentals of manufacturing companies.

This study has passed the normality test, heteroscedasticity test, autocorrelation test and multicollinearity test, so it has met the requirements for regression analysis testing. The coefficient of determination (R^2) test aims to test how influential the independent variable is in explaining the dependent variable. The R^2 test results are presented in Table 2. The adjusted R square value in Table 2 shows 0.485. This figure shows that the independent variables of circular economy (CE), and environmental performance (EP) can explain the dependent variable of corporate waste disclosure (CWD) by 48.5%, while the remaining 51.5% is explained by other variables outside the study.

Table 2. Determination Coefficient Test (R^2 Test)

Model	R	R Square	Adjust R Square	Std. Error of the Estimate
1	0,723	0,523	0,485	0,205

Source: Data processed (2025), Appendix G

Table 3. F Test

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4,055	7	0,579	13,803	0,000
	Residual	3,693	88	0,042		
	Total	7,748	95			

Source: Data processed (2025), Appendix I

The F test aims to test the feasibility of a regression model, as well as test the relationship between the independent and dependent variables studied. The significance value in Table 3 shows a value of 0.000,

which means that the regression model is suitable for testing because it has met the requirements to pass the F test. This conclusion is based on the requirement that the significance value must be less than 5% or 0.050 to pass the F test.

Table 4. Hypothesis Test (T Test)

Model	Unstandardized Coefficients		T	Sig.	Description
	B	Std. Error			
Constant	-2,839	0,562	-5,049	0,000	
CE	0,889	0,136	6,524	0,000	Significant, positive
EP	0,011	0,005	2,150	0,034	Significant, positive
FP_1	0,524	0,609	0,861	0,392	
FP_2	-0,324	0,203	-1,596	0,114	
FP_3	-0,292	0,248	-1,175	0,243	
FS	0,068	0,019	3,513	0,001	
FV	-0,004	0,008	-0,430	0,668	

Source: Data processed (2025), Appendix J

The hypothesis test (t) aims to prove the effect of the independent variable on the dependent variable in the regression model. The results in the hypothesis test are presented in Table 4. The results concludes that both circular economy (CE) and environmental performance (EP) have a significant and positive impact on company waste disclosure. In addition, financial performance (FP) and firm value (FV) as control variables have no significant influence on corporate waste disclosure, while firm size (FS) as a control variable has a significant and positive influence on corporate waste disclosure.

The Effect of Circular Economy on Corporate Waste Disclosure

The results of this study found that circular economy as measured using circular economy disclosure items has a significant and positive influence on corporate waste disclosure. The results of this study are in accordance with research conducted by Dagiliene et al. (2020) which states that companies that adopt a sustainability reporting framework tend to disclose more circular economy information in their sustainability reports. Vega and Rodriguez (2024) explain that a more comprehensive implementation of the circular economy can help companies to maximise waste utilisation. Saizarbitoria et al. (2023) said that companies tend to disclose more circular economy information in the absence of comprehensive practices. This study reveals that certain companies implement comprehensive circular economy practices as an authentic business strategy rather than mere regulatory compliance. These company adopt circular economy

principles to achieve long-term sustainability by balancing economic, social, and environmental considerations. Through genuine circular economy implementation, these company create value from waste while build corporate legitimacy through transparent waste management in respond to global sustainability trends.

From a theoretical perspective, this supports the legitimacy theory, which highlight how stakeholder recognition enables business sustainability. To obtain this legitimacy, companies must address three equally critical aspects: economic, environment, and social aspects. Circular economy practices serve as an effective mechanism for building public trust, giving companies the confidence to disclose detailed waste management information in their corporate reports. Such transparent disclosures capture stakeholder attention, ultimately earning the company recognition and approval. This stakeholder endorsed legitimacy allows businesses to maintain sustainable operations while making meaningful contributions to their surrounding environment and communities.

Pan Brother Tbk (PBRX) is a miscellaneous industry company engaged in the textile and garment subsector that has carried out comprehensive circular economy practices. The circular economy activities carried out by PBRX are in line with the triple bottom line concept which explains the importance of balance between economic, environmental, and social aspects to maintain business sustainability (Yip et al., 2023). One of PBRX's efforts in practising circular economy is by recycling used fabric pieces from garment and textile production into recycled yarn and fabric (PT Pan Brother Tbk, 2021). The company's strategy to reduce the generation and impact of corporate waste is a form of corporate commitment and responsibility that will increase the transparency of corporate waste disclosure in the company's sustainability report. PBRX's circular economy practices also involve MSMEs and neighbouring communities to increase their income. The company's strategy in developing its sustainability innovation has simultaneously helped the company in overcoming the legitimacy gap through circular economy practices. Based on this research, manufacturing companies that implement the circular economy model, especially those that implement circular economy activities comprehensively, have more advantages to disclose more information in corporate waste disclosure.

The Effect of Environmental Performance on Corporate Waste Disclosure

The results of this study found that environmental performance as measured using social return on investment (SROI) has a significant and positive influence on corporate waste disclosure. The results of this study are in accordance with the results of research conducted by Adyana and Gantyowati (2023) which found that companies that have good environmental performance will use corporate waste disclosure to communicate the results of their environmental investments to the public. The results of this study are also

in line with the results of research conducted by (Acar and Temiz, 2020) which explain that companies that have good environmental performance can separate themselves from companies with poor environmental performance by taking a competitive advantage so as not to be imitated by companies with poor environmental performance. Companies with strong environmental performance demonstrate their commitment to meet public expectations by providing transparent waste related information. Through comprehensive waste disclosure, these companies showcase their dedication to sustainability while maintaining a balance between economic, environmental and social considerations. Environmentally high performing companies not only differentiate themselves from competitors but also cultivate stakeholder trust and enhance their corporate image through transparency.

The finding of this study align with legitimacy theory perspective, which suggest that companies actively work to maintain business continuity by demonstrating alignment with stakeholder expectations. This alignment helps organizations secure and maintain legitimacy for their business activities. The triple bottom line concept explains that sustainable businesses must effectively balance three main aspects, namely economic, environmental, and social aspects. To preserve their legitimacy and ensure long-term sustainability, companies increasingly disclose waste management information as tangible evidence of their environmental commitment and corporate responsibility, particularly when supported by strong environmental performance.

Herbal and Pharmaceutical Industry Sido Muncul Tbk (SIDO) is a herbal and pharmaceutical company that has the maximum value in corporate waste disclosure and environmental performance. SIDO can be an example of a company with good environmental performance that discloses its efforts and innovations in corporate waste disclosure. In its sustainability report, SIDO utilises its organic waste, namely herbal pulp, to be reused as fertiliser and biomass fuel for boilers (PT Industri Jamu dan Farmasi Sido Muncul Tbk, 2022). SIDO's innovation has a positive impact on the health of the environment and surrounding communities. Based on the results of this study, manufacturing companies with good environmental performance have more privilege to disclose more corporate waste disclosure information.

Control Variable Analysis

Prior research by Nirwana and Wedari (2023) suggests that companies demonstrating strong financial performance often prioritize profit maximization over allocating resources to environmental and social initiatives. These findings reveal an interesting dynamic regarding financial performance indicators: manufacturing firms with higher Return on Assets (ROA) ratios tend to provide more extensive waste management disclosures. However, the difference in disclosure transparency between companies with strong versus weak ROA ratios proves statistically insignificant. Conversely, firms with strong Return on

Equity (ROE) and Net Profit Margin (NPM) ratios demonstrate reduced transparency in waste disclosures, while those with poorer ROE and NPM ratios show increased disclosure levels. These findings may indicates that companies with strong ROE and NPM prioritize shareholder returns over sustainability investments, viewing environmental disclosure as non-essential to core profitability. This may reflect either a strategic choice to allocate resources elsewhere or a complacency effect where financially successful firms feel less pressure to prove their environmental legitimacy.

Regarding firm size, our results align with Kartikasary et al. (2023), confirming that larger organizations possess greater resources to support environmental initiatives. The analysis reveals a positive and significant influence, indicating that manufacturing firms with larger total assets consistently provide more comprehensive company waste disclosures compared to their smaller counterparts. These may reflect that larger firms face heightened scrutiny from regulators, investors, and communities, compelling them to proactively address legitimacy gaps through transparent waste reporting. Their resources also enable systematic disclosure practices that reinforce their social license to operate.

These finding also indicate that market perceptions do not significantly influence waste disclosure practices among manufacturing firms. The relationship between firm value and waste disclosure presents a contrasting picture. As Kim and Kim (2024) establish, firm value reflects market perceptions of growth potential, while waste disclosure emphasizes sustainability and environmental responsibility. This fundamental divergence in orientation explains the negative and insignificant relationship observed. Interestingly, manufacturing companies with lower market valuations tend to disclose more waste management information, while those with higher valuations demonstrate reduced transparency. These finding may suggest that high value firms, already enjoying market validation, may deprioritize environmental transparency, assuming their valuation confers sufficient legitimacy. Lower value firms, however, utilize waste disclosure to strengthen their standing with stakeholders concerned about sustainability, as a strategic behaviour to seek legitimacy.

Conclusion

The findings of this study highlight the significant role of the circular economy and environmental performance in shaping corporate waste disclosure. Companies that actively implement circular economy practices tend to disclose more comprehensive waste related information, demonstrating a commitment to environmental responsibility that exceeds societal expectations. Similarly, firms with strong environmental performance leverage company waste disclosure as a means to reinforce their sustainability commitments, aligning with legitimacy theory and the triple bottom line concept. Interestingly, while financial

performance and firm value did not exhibit a significance influence, firm size emerged as a relevant factor, suggesting that larger corporations may have greater resources or stakeholder pressure to enhance transparency in waste reporting.

From a theoretical perspective, this study reinforces the applicability of legitimacy theory in explaining why companies prioritize company waste disclosure and viewing it as a tool to secure social approval and maintain operational legitimacy. Additionally, the triple bottom line concept provides a robust lens through which to understand how businesses balance economic, environmental, and social accountability. The introduction of Social Return on Investment (SROI) as an alternative metric for assessing environmental performance offers a fresh methodological contribution, moving beyond conventional measures such as PROPER rankings or carbon intensity.

Practically, these findings carry important implications for both businesses and policymakers. Companies are encouraged to integrate circular economy strategies such as waste recycling and resource efficiency into their core operations, not only to meet regulatory demands but also to strengthen stakeholder trust. Adopting tools like SROI can further enhance the credibility of sustainability reporting by quantifying environmental and social impacts in a structured manner. For policymakers and business associations, the study highlights the need for standardized circular economy disclosure guidelines to minimize reporting inconsistencies. Incentive programs, such as tax benefits or grants for firms that adopt circular practices, could accelerate industry wide adoption. Furthermore, mandatory third-party verification of waste disclosures could improve reliability and comparability across sectors.

Despite these insights, the study has certain limitations that warrant consideration. The reliance on a binary checklist for assessing GRI 306 and circular economy disclosures introduces a degree of subjectivity, which may affect the consistency of findings across different studies. The absence of universally accepted circular economy metrics means some aspects of corporate sustainability efforts may remain unaccounted for in current reporting frameworks. Additionally, the overlap between certain waste and circular economy disclosure items may lead to interpretive ambiguities. Finally, the restricted analysis of financial variables leaves room for future research to explore their direct influence on waste disclosure practices more thoroughly.

Future research should focus on refining measurement methodologies to better capture the nuances of circular economy implementation, potentially incorporating lifecycle assessments or material flow analyses. Expanding the scope of study to include high-impact industries like mining and energy, as well as extending the observation period, could yield more representative insights. There is also an opportunity to investigate how financial performance, firm size, and firm value directly shape waste disclosure behaviors, moving beyond their role as control variables. It is hoped that these recommendations will serve

as a guide for academics and practitioners in developing more environmentally responsible research and business practices.

Appendix

Appendix A. GRI 306: Waste 2020 Disclosure Indicators

Code	Disclosure Dimension	Index	Disclosure Indicator
306-1	Waste generation and significant waste-related impacts	CWD-1	Actual and potential significant waste-related impacts from the organization.
306-2	Management of significant waste-related impacts	CWD-2	Actions taken, including circular approaches, to prevent waste generation in the organization's own activities and throughout its FSstream and downstream value chain, and to manage significant impacts from waste generation.
		CWD-3	If waste from the organization's activities is managed by third parties, describe the process used to determine whether third parties manage waste according to contractual or regulatory obligations.
		CWD-4	Processes used to collect and monitor waste-related data.
306-3	Waste generation	CWD-5	Total weight of waste generated in metric tons, with breakdown by waste composition.
		CWD-6	Contextual information necessary to understand the data and data collection methods.
306-4	Waste diverted from disposal	CWD-7	Total weight of waste diverted from disposal in metric tons, with breakdown by waste composition.
		CWD-8	Total weight of hazardous waste diverted from disposal in metric tons, with breakdown by recovery operation.
		CWD-9	Total weight of non-hazardous waste diverted from disposal in metric tons, with breakdown by recovery operation.
		CWD-10	Detailed breakdown in metric tons of hazardous and non-hazardous waste diverted from disposal (on-site or off-site).
		CWD-11	Contextual information necessary to understand the data and data collection methods.
306-5	Waste directed to disposal	CWD-12	Total weight of waste directed to disposal in metric tons, with breakdown by waste composition.
		CWD-13	Total weight of hazardous waste directed to disposal in metric tons, with breakdown by disposal method.

Code	Disclosure Dimension	Index	Disclosure Indicator
		CWD-14	Total weight of non-hazardous waste directed to disposal in metric tons, with breakdown by disposal method.
		CWD-15	Detailed breakdown in metric tons of hazardous and non-hazardous waste directed to disposal (on-site or off-site).
		CWD-16	Contextual information necessary to understand the data and data collection methods.

Source: Global Reporting Initiative (2022)

Appendix B. Circular Economy Disclosure Index

Index	Disclosure Indicator
CE-1	The company is committed to reducing manual input per product unit
CE-2	The company is committed to reducing raw material and energy consumption
CE-3	The company proactively improves energy efficiency of production equipment
CE-4	Product packaging materials are reused multiple times
CE-5	Equipment cleaning materials are reused multiple times
CE-6	Residual materials are repurposed for manufacturing other products
CE-7	Waste generated during production processes is recycled
CE-8	Post-consumer product waste is recycled
CE-9	Recyclable waste and materials are reprocessed
CE-10	Processed waste and materials are utilized to manufacture new products

Source: Halbusi et al. (2024)

Appendix C. Social Return On Investment Five Stage Analysis

Stage 1	**Stakeholder Identification**
	The first stage involves identifying stakeholders - individuals or organizations experiencing changes or influencing activities, whether positively or negatively, as a result of the initiative being analysed.
Stage 2	**Impact Mapping**
	The second stage details how the analysed activity uses specific resources (inputs) to carry out activities (outputs) that deliver impacts (outcomes) for stakeholders. The inputs used are the economic costs generated by the company which also include economic costs, environmental costs, and social costs. Outputs include economic, environmental, and social activities. The impact of economic activities is proxied by an increase in retained economic value. The impact of environmental activities is proxied by savings in costs related to energy and the environment such as waste management costs, emissions, and biodiversity, electricity costs, water, etc. The impact of social activities is proxied by training and CSR activities.
Stage 3	**Outcome Verification and Valuation**
	The third stage is to collect data to verify that the expected outcomes have occurred, and assign a financial value to each outcome. Financial values use proxies to represent social, economic and environmental benefits. Economic benefits use indicators of the difference in retained economic value, environmental benefits use indicators of decreased or

	increased costs related to environmental activities, and social benefits use indicators of increased profits and total shares outstanding.
Stage 4	**Establishing Impact**
	The fourth stage is to assess the actual impact by adjusting for factors such as deadweight, attribution, and drop-off against other influences. Deadweight and attribution were assumed to be zero per cent (0%). Drop-off was assumed to be 10% as per the SROI guidelines.
Stage 5	**SROI Calculation**
	The fifth stage is to aggregate all monetizable benefits and subtract all negative costs or costs associated with achieving outcomes such as deadweight, attribution and drop-off. SROI is calculated by comparing the present value of social impact with the initial investment amount. The present value of social impact is calculated using present value (PV). The discount rate (r) used refers to the Bank Indonesia interest rate of 6.25%. The time period (n) used to calculate the PV is 5 years.

Source: Nicholls et al. (2012)

Appendix D. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CWD	96	.063	1.000	.377	.252
CE	96	.100	.800	.337	.183
EP	96	.075	24.147	5.241	4.967
FP_1	96	-.282	.313	.072	.096
FP_2	96	-.624	.862	.108	.192
FP_3	96	-1.408	.328	.063	.186
FS	96	26.639	32.093	29.458	1.197
FV	96	-4.105	17.580	2.682	3.252
Valid N (listwise)	**96**				

Appendix E. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		96.000
Normal Parameters[a,b]	Mean	.000
	Std. Deviation	.197
Most Extreme Differences	Absolute	.042
	Positive	.028
	Negative	-.042
Test Statistic		.042
Asymp. Sig. (2-tailed)		.200[e]
Monte Carlo Sig. (2-tailed)	Sig.	1.000
	95% ConfidenceLower Bound	.969
	Interval FSper Bound	1.000

a. Test distribution is Normal.

b. Calculated from data.

e. This is a lower bound of the true significance.

Appendix F. Heteroscedasticity Test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.178	7	.025	1.906	.078[b]
	Residual	1.177	88	.013		
	Total	1.355	95			

a. Dependent Variable: ABS_RES
b. Predictors: (Constant), FV, FS, EP, FP_3, CE, FP_2, FP_1

Appendix G. Autocorrelation Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.723[a]	.523	.485	.20486	.523	13.803	7	88	.000	2.086

a. Predictors: (Constant), FV, FS, EP, FP_3, CE, FP_2, FP_1
b. Dependent Variable: Log_CWD

Appendix H. Multicollinearity Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.839	.562		-5.049	.000		
	CE	.889	.136	.570	6.524	.000	.709	1.410
	EP	.011	.005	.190	2.150	.034	.695	1.439
	FP_1	.524	.609	.177	.861	.392	.128	7.806
	FP_2	-.324	.203	-.218	-1.596	.114	.289	3.455
	FP_3	-.292	.248	-.190	-1.175	.243	.208	4.807
	FS	.068	.019	.283	3.513	.001	.832	1.202
	FV	-.004	.008	-.041	-.430	.668	.581	1.722

a. Dependent Variable: Log_CWD

Appendix I. F Test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.055	7	.579	13.803	.000[b]
	Residual	3.693	88	.042		
	Total	7.748	95			

a. Dependent Variable: Log_CWD
b. Predictors: (Constant), FV, FS, EP, FP_3, CE, FP_2, FP_1

Appendix J. T test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-2.839	.562		-5.049	.000		
	CE	.889	.136	.570	6.524	.000	.709	1.410
	EP	.011	.005	.190	2.150	.034	.695	1.439
	FP_1	.524	.609	.177	.861	.392	.128	7.806
	FP_2	-.324	.203	-.218	-1.596	.114	.289	3.455
	FP_3	-.292	.248	-.190	-1.175	.243	.208	4.807
	FS	.068	.019	.283	3.513	.001	.832	1.202
	FV	-.004	.008	-.041	-.430	.668	.581	1.722

a. Dependent Variable: Log_CWD

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