The impact of corporate governance on environmental reporting: Evidence from the Indonesian manufacturing industry

S R Ika¹, J P Nugroho¹, N Achmad², and A K Widagdo³,⁴
¹Department of Accounting, Janabdra University Yogyakarta, Jl Tentara Rakyat Mataram 55-57 Yogyakarta, 55231, Indonesia
²Faculty of Engineering, Janabdra University Yogyakarta, Jl Tentara Rakyat Mataram 55-57 Yogyakarta, 55231, Indonesia
³Faculty of Economics and Business, Sebelas Maret University, Jl Ir Sutami 36 A Solo, 57771, Indonesia
E-mail: widagdo1998@staff.uns.ac.id

Abstract. Environmental reporting is the preparation, presentation, and dissemination of information on how the company interacts with the natural environment. The report is commonly presented to its stakeholders in the company’s annual report. The purpose of this study is to empirically examine the impact of corporate governance practices on environmental reporting. The corporate governance characteristics utilized in the study are audit committee effectiveness, board size, and ownership concentration. While size and profitability is the control variable of the study. One hundred and two manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2015 to 2017 were used as a sample, resulting in 306 company observations. Employing data panel regression analysis, the results indicate that audit committee effectiveness and board size positively influence environmental reporting. These results suggest that the more effective the audit committee is, and the higher the number of commissioners in the company, the higher the company’s encouragement to provide environmental information in the company’s annual report. The study also found that size positively associate with environmental disclosure. The study offers additional perspectives on factors that can affect the listed companies to report environmental reporting within the G4 environmental framework of the Global Reporting Initiative (GRI). Hence, the capital market authority agency may strengthen the regulation related audit committee to improve environmental awareness in IDX.

1. Introduction
Rapid industry growth has been leading to economic growth but has also contributed to environmental problems growing worldwide. The condition led to society, realizing that natural well-being severely and repeatedly degrades [1]. In this circumstance, businesses have been regarded as the primary contributor to pollution and have faced the pressure to participate in a more responsible business by protecting the natural environment [2]. The stakeholders of companies, specifically socially aware investors, demand the reporting of the degree in which a corporation is dedicated to environmental sustainability and the manner in which they deal with the environment.

It is widely explored that good corporate governance is related to improved accountability and credible disclosure to its stakeholders [3]. Therefore, it is necessary to understand the degree of environmental reporting performed by a corporation in the sense of how the organization is regulated...
and managed [4]. Good governance should improve accountability, openness and eventually contribute to both voluntary and mandatory disclosure.

Some researches investigate the influence of corporate governance attributes on the level of environmental reporting in the company annual report. In the international arena, for example, [5] studied the effect of board effectiveness on voluntary climate change disclosure in Canada. [4] scrutinize the impact of governance characteristics such as board independence, board size, concentrated ownership, and the proportion of female director on environmental disclosure in Australia. Some similar studies also found in some countries for example [1] in India, [6] in Pakistan, [7,8] in Malaysia, [9–11] in Indonesia and [12] in 54 largest companies worldwide running in the petroleum refining sector. The study results vary in terms of the significant corporate governance characteristics influencing environmental disclosure depending upon the country setting. Corporate social and environmental reporting in non-developed countries is heavily shaped by external forces/influential players namely domestic consumers, foreign investors, international broadcasting and international regulators (e.g. the World Bank). Unlike developed nations, businesses in developing countries feel relatively little public pressure to communicate corporate social responsibility [13].

The purpose of this study is to examine whether corporate governance features influence the level of environmental reporting in the Indonesian context. The corporate governance attributes observed in the present study are audit committee effectiveness, board size, and ownership concentration along with the control variables company size and profitability.

A review in the extant literature, as mentioned above, suggest that the audit committee variable is rarely to be examined in the relationship of corporate governance and environmental reporting. Previous studies conducted in Indonesia investigate the effect of board size, the proportion of independent director [10], percentage of female directors [14], managerial ownership [11], media coverage [11,15] on environmental reporting. The audit committee may greatly influence the degree of environmental reporting due to its oversight responsibility in ensuring financial and non-financial reporting quality released by the company. The audit committee is a committee under the board of commissioners with financial and accounting expertise to suggest or input the board of commissioner relate to internal and external audit matter and the compliance to the regulations. [16] found that the audit committee's effectiveness positively affects the level of corporate social responsibility (CSR) reporting. Hence this study posits that the effectiveness of the audit committee has a positive association with the level of environmental reporting.

The board size denotes to the number of commissioners on the board. There were opposing views on the acceptable size for a company's board. One view that larger boards can enhance the level of collective control and decision-making by using the board's diverse experience and expertise [17]. On the other hand, one supports smaller boards as they are deemed more successful in making a consensus decision and tracking management actions [18]. Recent studies find a strong positive association between board size and environmental disclosure [4,7,8,19]. This research follows this finding and propose the following hypothesis. Board size has a positive impact on the level of environmental reporting.

The concentration of ownership influences how the control power is distributed in management actions [8]. Higher ownership concentration would improve monitoring and control power and avoid negligent management. In a highly concentrated ownership organization, minority shareholders possess little influence and cannot discourage major shareholders from pursuing their agenda. It is expected that management would reveal less CSR activities in a centralized shareholding system because of the limited number of shareholders pressurizing companies to disclose their environmental concerns. Therefore, this study posits that ownership concentration has a negative effect on the level of environmental reporting.

2. Methods

2.1. Sample, sampling, and data collection

The sample utilized in this study was all companies in manufacturing industry listed on the Indonesia Stock Exchange (IDX) in 2015-2017. The number of companies that consistently listed during the
three years were 110 companies. Eight companies were excluded from the list due to unavailability of annual reports. Hence, there were 102 companies used as a sample, resulting in 306 company observations from 2015 to 2017. Data were collected from the annual report which is available either in the IDX website or companies’ official website. This study selects the manufacturing industry due to several reasons. Firstly, the highest number of the company listed is in the industry. Secondly, to some extent, the process of production in the sector may detrimental to the environment. This study picks 2015-2017 because that was the latest data when this research was begun.

2.2. Dependent variable
The dependent variable in the present study is environmental disclosure (ED). Following previous studies [2,20–24], this study utilizes a set of unweighted ED checklist to determine the environmental reporting level disclosed by the sample companies. The checklist in the index was created from the environment-focused GRI G4 framework. It comprises 34 checklist objects. Therefore, this study did not assess the content of the information provided; instead, it investigates whether statements relating to the environmental items included in the index were present or absent [2]. In the annual report, if the information has been stated, it earns the score one and zero otherwise. The index’s maximum score probable is 34. Then the level of ED is displayed in percentage.

The index contains 12 categories of environmental reporting topics. It provides among other, discussion on materials, electricity, water, habitats, pollution, waste and effluents, goods and services, conformity with regulations, transportation, other carbon emissions, environmental performance of the supplier and the mechanism to address environmental problems.

2.3. Independent variables
Corporate governance attributes namely audit committee effectiveness (ACEF), board size (BDSIZE), ownership concentration (OWNC) are the independent variables of the study. Meanwhile, company size (SIZE) and profitability (ROA) are the control variables. The operational definition of each variable is presented in Table 1.

ACEF was assessed by an index of audit committee effectiveness developed by [25]. The index includes four elements that are classified into ten criteria, namely composition, authority, resources and diligence. The index scoring procedure follows [25]. The scoring was based on the presence of criteria (i.e. "1" and "0"), except for the duty of the audit committee. If the audit committee has a brief comment, a score of 1 is applied. If a specific obligation is also clarified, a score of 2 will be awarded. If a firm does not state at all relates to particular duty in the annual report, the score would be 0. The ranking for the effectiveness of the audit committee is the total of all criteria, with the highest score is fourteen. Table 2 presents the audit committee effectiveness index.

2.4. Analysis Technique
This study utilizes panel data regression analysis to examine the influence of corporate governance characteristics, company size, and profitability on environmental disclosure. The equitation of the regression model is as follow. This study also conducts the classical assumption test to guarantee the unbiased result of the regression test.

$$ED = \alpha + \beta_1\text{ACEF} + \beta_2\text{BDSIZE} + \beta_3\text{OWNC} + \beta_4\text{SIZE} + \beta_5\text{ROA} + e$$

### Table 1. The operational definition of variables used in the study

| Variable | Definition | Measurement |
|----------|------------|-------------|
| ED       | Environmental disclosure | The number of environmental items (based on GRI G4 in the field of environment) which were reported by the company divided by the maximum possible score of the index. |
| ACEF     | Audit committee effectiveness | The total score of audit committee effectiveness index based on [25] |
BDSIZE  Board size  The number of board of commissioners
OWNC  Ownership concentration  The number of shares owned by substantial shareholders, i.e. shareholders holding 5% or more
SIZE  Company size  Natural logarithm of total asset
ROA  Profitability ratio  Return on asset: Net income divided by total asset

| Table 2. The audit committee (AC) effectiveness index. |
|-------------------------------|----------------------------------|------------------|---------|
| Element                      | Proxy                           | Criteria                      | Scoring |
| Composition                  | AC independence                 | All members are outside independent parties | 1 or 0 |
|                              | AC expertise                    | At least one member is having educational background in accounting or finance | 1 or 0 |
| Authority                    | AC charter                      | There is a statement concerning AC charter | 1 or 0 |
|                              | AC duty                         | Reviewing firm’s financial information | 0, or 1, or 2 |
|                              |                                | Evaluate external auditing activity | 0, or 1, or 2 |
|                              |                                | Examine the effectiveness of firm’s internal control | 0, or 1, or 2 |
|                              |                                | Assess firm’s compliance with regulation | 0, or 1, or 2 |
| Resources                    | AC size                         | Consist three members as a minimum | 1 or 0 |
| Diligent                     | AC meeting                      | Having as a minimum four times of meeting in a year | 1 or 0 |
|                              | AC voluntary disclosure         | There is a voluntary statement or report regarding AC | 1 or 0 |

3. Result and discussion

3.1. Descriptive statistic
Table 3 presents the descriptive statistic of the variables used in the study. It consists of the minimum, maximum, mean, standard deviation.

| Table 3. Descriptive statistic |
|-------------------------------|-------------------------------|------------------|---------|
| Element | Minimum | Maximum | Mean  | Standard Deviation |}
| ED      | 1.44    | 38      | 13.034 | 7.230          |
| ACEF    | 1       | 14      | 8.04   | 2.862          |
| BDSIZE  | 2       | 11      | 4.33   | 1.783          |
| OWNC    | 29.71   | 100     | 76.14  | 16.352         |
| SIZE    | 7.87    | 21.42   | 3.968  | 19.801         |
| ROA     | -90.48  | 132.37  | 8.042  | 16.636         |
| N       | 306     | 306     | 306    | 306            |
As presented in Table 3, the level of environmental reporting in the sample company is 13.03 per cent on average, the minimum score is 1.44 per cent, and the highest score is 38 per cent. The result denotes that the level of environmental reporting in the manufacturing industry is minimum. The finding is consistent with the conclusion of previous studies which stated that the level of environmental reporting of Indonesian companies is moderate [10,11,14,26].

Audit committee effectiveness ranges from one to fourteen, with the mean value of audit committee effectiveness of the sample companies around 8. The number of board commissioners in the sample company is between 2 to 11 persons. While the average number of board size is 4 persons. Ownership concentration ranges from 29.71 per cent to 100 per cent, with the mean value of the ownership being 76.14 per cent. The numbers suggest that companies in Indonesia are highly concentrated [27]. The profitability of the sample companies is 8.04 on average, while the company size is 3.97 on average.

3.2. Panel data regression result

To examine the effect of corporate governance mechanisms on environmental reporting, we conduct a panel data regression analysis. Result of the regression is shown in Table 4.

| Table 4. Panel data regression result |
|--------------------------------------|
|                                | B    | t    | Sig  | Tolerance | VIF |
|--------------------------------------|------|------|------|-----------|-----|
| Constant                            | -3.172 | -0.0950 | 0.343 |           |     |
| ACEF                                 | 0.790 | 6.128 | 0.000*** | 0.968 | 1.033 |
| BDSIZE                               | 1.205 | 5.387 | 0.000*** | 0.828 | 1.208 |
| OWNCC                                | -0.026 | -1.178 | 0.240 | 0.978 | 1.023 |
| SIZE                                 | 0.472 | 2.234 | 0.021** | 0.814 | 1.229 |
| ROA                                  | 0.000 | 0.006 | 0.995 | 0.955 | 1.047 |
| F Value                              |      |      |      | 19.439 |     |
| F sig                                |      |      |      | 0.000*** |     |
| Adjusted R²                          |      |      |      | 0.232 |     |
| Kolmogrov Smirnov Sig                |      |      |      | 0.052 |     |

*** denotes significant at 1%; ** denotes significant at 5%.

As can be seen in Table 4, ACEF and BDSIZE are positively associated with environmental reporting, significant at 1% level. The results indicate that the more effective audit committee in an organization, and the higher the number of board commissioners, the more environmental activities explained in the company annual report. The results are consistent with[16], which found that audit committee effectiveness is more likely to enhance a company's corporate social responsibility disclosure. Through its duty in reviewing firms' financial information, including the disclosure in the annual report, the effective audit committee may encourage the management to provide more statement in sustainable business and environmental related issues.

The finding that board size is more likely to improve environmental disclosure is similar with [4,8–11] which found that board number has a favorable impact on the extent of environmental reporting in Australia, Malaysia, and Indonesia. The findings may imply that large board of commissioners encourage the management to increase environmental engagement reported in the company annual report. Larger board has tremendous intellectual knowledge compared to small boards that support the management's decision-making and eventually boost businesses' efficiency, both financial and non-financial [6].
Table 4 suggests that OWNC does not have any influence on environmental disclosure. Such finding is similar with [8,10] which documented the insignificant relationship between block holder ownership and environmental disclosure. This may imply the negligible role of block owners and of owners in directing and dictating greater public disclosure of environmental information. Another potential explanation may be that Indonesian owners usually do not regard environmental concerns as crucial issues to be widely published in annual corporate reports [10].

Table 4 suggests that SIZE is also likely to increase environmental reporting. The result suggests that the larger the firm, the more incentive for the firm to disclose environmental activity in its annual report. The finding of the study is consistent with [10,28]. More remarkable institutions may also be subject to further public scrutiny and pressure, particularly from independent environmental organizations, such as the Indonesian Environment Forum (WALHI). As Indonesia's largest environmental organization [10], WALHI publicly criticizes larger corporations (e.g. industrial resources) for its practices, which can or may already harm the natural environment.

Meanwhile, as shown in Table 4, profitability has no association with the extent of environmental reporting. The results designate that whether the company is making profit or loss, it does not impact on the extent of environmental reporting. It is consistent with [2,10,11,29,30] study which found that profitability does not have any relationship with the extent of environmental disclosure.

The value of adjusted R² in Table 4 is 0.232, indicating that the predictive power of the independent variables toward the dependent variable is about 23.2 per cent. The remaining 76.8 per cent are the other variables that not captured in the study. As presented in Table 4, the Kolmogorov Smirnov sig value is 0.052, slightly above 0.05. The deal suggests that the regression model is free from normality problem. The Tolerance and VIF value in Table 4, which exceed 0.1 and less than 10, respectively, indicate that the regression model is free from multicolinearity problem.

4. Conclusion

Results of panel data regression analysis indicate that audit committee effectiveness and board size positively affect environmental disclosure. The results imply that the higher the audit committee effectiveness and the greater the number of board commissioners, the more likely the company discloses environmental issues in its annual reports.

The study has some limitations that should be taken into account in understanding the results. First, the value of adjusted R² is moderate, around 23 percent. It indicates some variables of governance characteristics that need to be included in the regression model. Future research may add these unexamined variables, for example, foreign ownership, managerial ownership, and the percentage of independence commissioners. Second, the findings cannot be generalized to other industries or other country settings.

References

[1] Ezhillarasi G and Kabra K C 2017 The impact of corporate governance attributes on environmental disclosures: Evidence from India Indian J. Corp. Gov. 10 24–43
[2] Monteiro S M da S and Albar-Guzmán B 2010 Determinants of environmental disclosure in the annual reports of large companies operating in Portugal Corp. Soc. Responsib. Environ. Manag. 17 185–204
[3] Cormier, D., Ledoux, M., & Magnan M 2010 Corporate governance and information asymmetry between managers and investors. Corp. Gov. Int. J. Bus. Soc. 10 574–89
[4] Rao K K, Tilt C A and Lester L H 2012 Corporate governance and environmental reporting: An Australian study Corp. Gov. Int. J. Bus. Soc. 12 143–63
[5] Ben-Amor W and McElhenny P 2015 Board Effectiveness and the Voluntary Disclosure of Climate Change Information Bus. Strateg. Environ. 24 704–19
[6] Rafique M A, Malik Q A, Waheed A and Khan N-U 2017 Corporate Governance and Environmental Reporting in Pakistan Corporate Governance and Environmental Reporting in Pakistan Pakistan Adm. Rev. 1 103–114
[7] Buniamin S, Alrazi B, Johari N H and Abd Rahman N R 2008 An investigation of the
association between corporate governance and environmental reporting in Malaysia Asian J. Bus. Account. 165–88

[8] Yusoff H, Darus F and Rahman S A A 2015 Do corporate governance mechanisms influence environmental reporting practices? Evidence from an emerging country Int. J. Bus. Gov. Ethics 10 76–96

[9] Djajadikerta H G and Trireksani T 2012 Corporate social and environmental disclosure by Indonesian listed companies on their corporate web sites J. Appl. Account. Res. 13 21–36

[10] Nurhayati R, Brown A and Tower G 2006 Understanding the level of natural environment disclosures by Indonesian listed companies J. Asia Pacific Cent. Environ. Account. 12 4–11

[11] Junita N L and Yulianto A 2018 The Determinants Affecting Environmental Disclosure in the High Profile Companies in Indonesia Account. Anal. J. 7 114–50

[12] Ienciu I-A, Popa I E and Ienciu N M 2012 Environmental Reporting and Good Practice of Corporate Governance: Petroleum Industry Case Study Procedia Econ. Financ. 3 961–7

[13] Ali W, Frynas J G and Mahmood Z 2017 Determinants of Corporate Social Responsibility (CSR) Disclosure in Developed and Developing Countries: A Literature Review Corp. Soc. Responsib. Environ. Manag. 24 273–94

[14] Trireksani T and Djajadikerta H G 2016 Corporate governance and environmental disclosure in the Indonesian mining industry Australas. Accounting, Bus. Financ. J. 10

[15] Verawaty, Merina C I, Jaya A K and Widianingsih Y 2018 Determinants of environmental disclosure in Indonesia Adv. Econ. Bus. Manag. Res. 117 217–26

[16] Ika S R, Dwiwinarno T and Widagdo A K 2017 Corporate social responsibility and corporate governance in Indonesian public listed companies SHS Web Conf. 34 1–11

[17] Bonn I 2004 Board Structure and Firm Performance: Evidence from Australia J. Aust. New Zeal. Acad. Manag. 10 14–24

[18] Vafeas N 1999 Board meeting frequency and firm performance J. financ. econ. 53 113–42

[19] Said R, Zainuddin Y, Haron H, Hj Zainuddin Y and Haron H 2009 The relationship between corporate social responsibility disclosure and corporate governance characteristics in Malaysian public listed companies Soc. Responsib. J. 5 212–26

[20] Patten D M 2002 The relation between environmental performance and environmental disclosure: A research note Accounting, Organ. Soc. 27 763–73

[21] Freedman M and Jaggi B 2005 Global warming, commitment to the Kyoto protocol, and accounting disclosures by the largest global public firms from polluting industries Int. J. Account. 40 215–32

[22] de Villiers C and van Staden C J 2006 Can less environmental disclosure have a legitimizing effect? Evidence from Africa Accounting, Organ. Soc. 31 763–81

[23] Cho C H and Patten D M 2007 The role of environmental disclosures as tools of legitimacy: A research note Accounting, Organ. Soc. 32 639–47

[24] Clarkson P M, Li Y, Richardson G D and Vasvari F P 2008 Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis Accounting, Organ. Soc. 33 303–27

[25] Ika S R and Mohd Ghazali N A 2012 Audit committee effectiveness and timeliness of reporting: Indonesian evidence Manag. Audit. J. 27 403–24

[26] Hadiningtiyas S W and Mahmud A 2017 Determinant of Environmental Disclosure on Companies Listed in Indonesia Stock Exchange (IDX) Account. Anal. J. 6 380–93

[27] Brown R A 2006 The Rise of the Corporate Economy in Southeast Asia (London and New York: Routledge)

[28] Eng L L and Mak Y T 2003 Corporate governance and voluntary disclosure J. Account. Public Policy 22 325–45

[29] Gray R H 2005 Environmental reporting Kaikeigaku Jiten (Dictionary of Accounting) ed Y Jinnai (Tokyo: Aoki Shoten)

[30] Pahuja S 2009 Relationship between environmental disclosures and corporate characteristics: A study of large manufacturing companies in India Soc. Responsib. J. 5 227–44