The Biodiversity Disclosure Determinants in Indonesian Chemical Companies

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Abstract. Biodiversity is a central point in the Sustainable Development Goals (SDGs) to balance ecological and economical interests. There is a growing need for biodiversity disclosure as part of environmental-related information, but companies provide a lack of biodiversity information. This study examines the relationship between family ownership, institutional ownership, profitability, and leverage as the determinants of the biodiversity disclosure index. The sample consists of chemical companies listed on the Indonesian Stock Exchange (IDX) during 2018 - 2022 and comes up with 85 firm-year observations. The analysis was conducted using GLS panel data regression. The study documents a negative relationship between family ownership and biodiversity disclosure, suggesting the resistance of family-based companies when uncovering the condition of biodiversity surrounding their business. Financial incentives through profitability and leverage cannot provide the expected significant result. The insignificant role of institutional ownership also indicates that proper enforcement and monitoring of biodiversity disclosure need to be enhanced.

Keywords: Sustainable Development Goals, Biodiversity Disclosure, Family Ownership.

1   Introduction

Biodiversity plays a pivotal role in the continuation of the Earth and human life as one of the fifteen SDGs of the United Nations. Through the interaction between ecosystems, species, and genes, biological diversity or biodiversity creates some economic benefits for humans. The benefits can be seen through biodiversity as a natural regulating system, a source of all cultural beliefs, a natural resource provider, and a "home" on Earth [19]. Nevertheless, as a human-made activity, industry creates adverse environmental side effects and biodiversity loss [5]. Thus, [19] stated that there should be an act that companies do to minimise the loss of biodiversity, one of which is by conducting action taken to decrease or even prevent the loss of biodiversity and communicating those actions in the form of biodiversity disclosure.

The Indonesian government has implemented several regulations to pressure companies to practise actions and do communication-related to environmental matters. Some examples are Law Number 40 of 2007 about Limited Liability Companies, Government Regulation Number 47 of 2012 concerning the Social and Environmental Responsibility of Limited Liability Companies, Law Number 25 of 2007 about Capital Investment, and OJK Regulation Number 51 of 2017 concerning The Implementation of Sustainable Finance for Financial Institutions, Issuers, and Limited Liability Companies. Nevertheless, most regulations in Indonesia only emphasise the importance of sustainability reporting in general. The government allows existing companies to adopt various standards set by some experienced and well-known non-government organisations (NGOs) on the related topic. Hence, based on [27], in Indonesia and other Asia Pacific countries, the Global Reporting Initiative (GRI) Standard is the most used guideline for disclosing environmental-related information, including biodiversity, and as a benchmark for environmental activities practised by companies.

The disclosure of environmental and biodiversity information is still diverse among all companies in every industry, including Indonesia, although some standards have been launched as a guideline. Therefore, the determinants that cause the disclosure of biodiversity are worth studying. Additionally, it is crucial to be aware that a company's management may disclose some information depending on its commitment, priorities, and awareness of its internal and external environments [15]. Several previous studies have discussed the general determinants of environmental disclosure, and various outputs have been documented.

Some prior studies assumed ownership structure as one of the vital determinants of environmental and social disclosure [30] [21] [20]. [21] stated that different types of investors create different pressures on the management to disclose company information. As a result, Adu et al., cited by [30], argued that any biodiversity information disclosed in annual reports and sustainability reports aligns with the suggestions from company investors as owners and as the dominant player in the company's ownership structure. Research by [3] documented that family and institutional ownership are Indonesia's most common ownership structures. Hence, the current research studied the impact of family and institutional ownership on biodiversity disclosure.

Every company's decision, including the disclosure of environmental information, must consider financial performance [30]. [1] argued that profitability and leverage are two financial indicators commonly used in research. Profitability is considered an essential indicator due to its impact on a company's position and performance in the market [16]. On the other hand, leverage describes the financial composition of a company's assets and liabilities and is a barometer of creditors' involvement in the company's asset composition.

Numerous arguments estimate the determinants of environmental disclosure, yet the results are inconsistent, and few have analysed the specific biodiversity disclosure determinants. Moreover, biodiversity disclosure seems to be rarely studied in Indonesia, even though Indonesia's forest is ranked as the eighth most significant area, Indonesia's exclusive economic zone is ranked as the sixth largest in the world, and Indonesia is considered one of several mega-biodiverse countries. Thus, the current study is trying to minimise the knowledge gap from the prior research by:

discussing the determinants of biodiversity disclosure in Indonesia;

extending the literature by the combination of family ownership and institutional ownership as ownership structure, profitability, and leverage as the expected determinants; and

analysing the Indonesian chemical companies listed in the Indonesia Stock Exchange Industrial Classification (IDX-IC) during 2018–2022 due to their high impact on biodiversity [8].

The rest of this study is arranged as follows. Section 2 describes the fundamental theory and the development of the hypotheses. Section 3 explains the method used for this research. Section 4 discusses the output generated from the analysis conducted. Section 5 concludes the research outputs, limitations encountered during the current study, suggestions for future research, and contributions to the related literature.

2   Hypothesis Development

2.1   Biodiversity Disclosure

The disclosure of biodiversity by companies is a form of communication about a company's actions and initiatives regarding preserving the living organisms on Earth [29] and preventing biodiversity loss. Because of that, the disclosure of biodiversity is considered a continuation of the corporate social responsibility (CSR) strategy and the environmental, social, and governance (ESG) framework to show the company's involvement in supporting a better condition of the Earth. Several standards have been launched to set the minimum amount of information a company should disclose. Thus, based on research by [27], the Global Reporting Initiative (GRI) Standard is the most used guideline for disclosing environmental-related information in Asia Pacific countries. The GRI standard requires companies to inform practices and decisions that have a high probability of causing biodiversity loss, the impacted value chain by a company's operation, and the initiatives companies take to minimise their impact on biodiversity and the environment [18].

Legitimacy and stakeholder theory explain the act of biodiversity disclosure by a company, according to the current research. Businesses must disclose information about non-financial factors, such as biodiversity, to gain societal legitimacy. Legitimacy theory also assumes that companies have a social contract with the public and its environment [6]. Therefore, [4] argued that biodiversity disclosure becomes a vessel to create a better company image. An example of this argument is when PT Adaro Energy Indonesia Tbk received a Padmamitra award from the Indonesian Ministry of Social Affairs for their conservation of the Bekantan population in Bakut Island during 2018–2022 [31].

The stakeholders mentioned in this research were shareholders, who are the most salience stakeholders in most companies. Stakeholder theory assumes management wants to maximise communication with shareholders to manage their bonds [9]. Thus, in the current situation, companies are maximising their efforts to disclose more information regarding the high demand for biodiversity information from shareholders. In

conclusion, stakeholder and legitimacy theories have created a basis for estimating the determinants of biodiversity disclosure in current research.

2.2   Family Ownership and Biodiversity Disclosure

Family ownership happens when the dominant investors in a company are family-related. A company can have more than one family as an investor yet still be considered to have family ownership. Family-owned companies carry the image of the company and the family. If the company's reputation is not good in the eyes of the public and other stakeholders, the family image will also be tarnished. Thus, according to legitimacy and stakeholder theory, family investors tend to do anything to make the company legitimate and raise the company's value. [20] stated that there was a positive relationship between family ownership and sustainability disclosure quality (SDQ). Therefore, the current research states the following hypothesis:

H1.   Family ownership positively affects biodiversity disclosure.

2.3   Institutional Ownership and Biodiversity Disclosure

Institutional ownership indicates the ownership of institutional investors in a company in the form of shares. In the current study, the financial constitutions of banks and non-banks encompass institutional investors. According to stakeholder theory, those financial constitutions are interested in increasing the company's value and maximising its welfare. They also tend to focus on a long-term strategy for monitoring a company's management [26] to make the company legitimate, based on legitimacy theory. Hence, [23] argued that institutional ownership has a positive and significant relationship with biodiversity disclosure. [7] also strengthen the argument by [23]. Hence, in the current research, the hypothesis for institutional ownership and biodiversity disclosure is as follows:

H2.   Institutional ownership positively affects biodiversity disclosure.

2.4   Profitability and Biodiversity Disclosure

Profitability is one of many financial measurements to assess manager performance [1]. Companies with high levels of profitability can be considered successful in the short term. With its high level of profitability, a company's management makes a decision that hopefully will increase its value. [11] argued that companies with high levels of profitability tend to take more initiative and disclose more information on environmental matters to increase their value and differentiate themselves from companies with low levels of profitability. Hence, biodiversity disclosure is seen as an instrument for actualising this concept. Several studies have stated a positive relationship between profitability and environmental disclosure [1] [17] [16]. Therefore, this research hypothesises the relationship between profitability and biodiversity disclosure as follows:

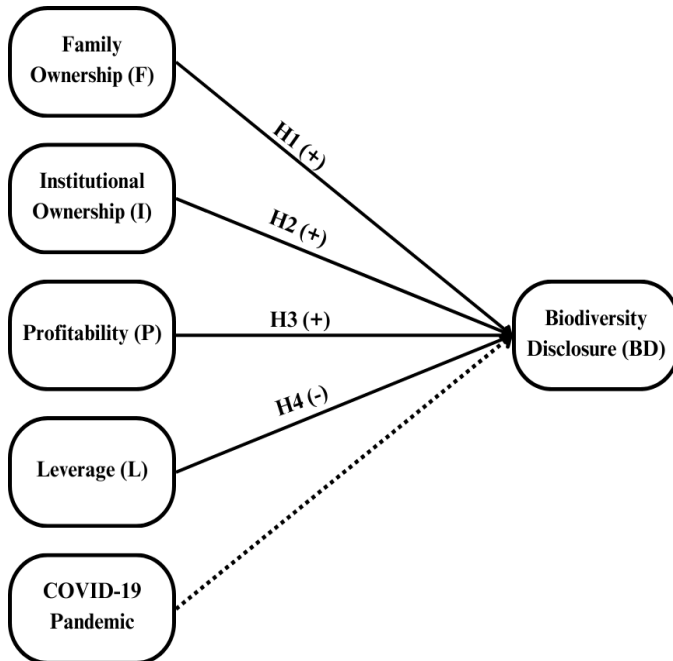H3.   Profitability positively affects biodiversity disclosure

Figure 1. The hypothesis between independent variables and dependent variable.

2.5 Leverage and Biodiversity Disclosure

Leverage shows the composition of the company's debts to creditors amongst its assets. A high debt composition leads creditors to have a more dominant role in examining the company. Additionally, a high level of leverage beyond the industry level leads to more company risks. Thus, companies tend to prioritise mitigating and stabilising their leverage score. Moreover, based on stakeholder theory, creditors will just focus on the company's liability towards its debt. This action forced the company to focus on financial performance and decreased the company's focus on non-financial aspects, such as biodiversity disclosure. Therefore, a high level of leverage will reduce the quantity and quality of biodiversity disclosure. In their research, [1] and [25] supported this assumption. Hence, the hypothesis is stated as follows:

H4.   Leverage negatively affects biodiversity disclosure.

Table 1. The Details of the Variable Used

Variables	Acronym	Operationalization
Biodiversity disclosure	BDI	A measurement of the quality of biodiversity disclosure based on the 53-item Biodiversity/Extinction Index by [14]. The maximum score is 100%.

Family ownership	FO	The presentation of total shares owned by family investors.
Institutional ownership	IO	The presentation of total shares owned by institutional investors.
Profitability	ROA	The result of dividing a company's total assets by its net income in the same year.
Leverage	LEV	The result of dividing a company's total assets by its total debts in the same year.
The COVID-19 pandemic	CP	A dummy variable is "1" if the observation represented the year during the COVID-19 pandemic (2020, 2021, or 2020) and "0" if it did not represent years during the COVID-19 pandemic (2018 or 2019).

3   Method

This research utilised one dependent variable, four independent variables, and one control variable. Table 1 shows the details of the variables and their operational definitions used in the current research. The population for this study was the listed Indonesian chemical companies in IDX-IC, while the sample was those between 2018 - 2022. The chemical industry was chosen because it is considered one of several industries with the most impact on biodiversity [8]. Through elimination, the final samples collected for the current research were 85 observation years from 17 companies.

This research data was considered to be panel data. Annual and sustainability reports were downloaded from the company's website to collect the data. The data was then analysed, prepared, and edited to prevent missing data. The descriptive statistical measurements used for this research were minimum, maximum, mean, and standard deviation for BDI, FO, IO, ROA, and LEV, as well as frequencies for CP. Panel data regression was employed for the multiple regression analysis, and Eviews for student version 12 software programme was used to help with further analysis. The regression model of this research is described as follows.

$$BDI_{it} = \beta_1 + \beta_2 FO_{2it} + \beta_3 IO_{3it} + \beta_4 ROA_{4it} + \beta_5 Lev_{5it} + \beta_6 CP_{6it} + \varepsilon_{it} \qquad (1)$$

4   Result and Analysis

4.1   Descriptive Statistics

Three tables of descriptive statistical outputs were created to depict the collected data in the current research. Table 2 explains the descriptive statistics of the biodiversity disclosure index. Table 3 explains the descriptive statistics of the COVID-19 pandemic

as a dichotomous variable. Lastly, Table 4 explains the descriptive statistics of family ownership, institutional ownership, profitability, and leverage as continuous variables.

Table 2 displays the tendency for low BDI scores with a minimum of 0 and a maximum of 0.51. The maximum value of the BDI score was barely past 50%, which is the half value of 100%, the maximum score. The mean value of BDI scores was 0.07 or 7% out of 100%, which is the total score possible. Regarding BDI on the count, the minimum value was 0 and the maximum value was 27, higher 0.05 than 26.5, the middle count of 53 indexes. The mean of the BDI count was 3.60 or 7% out of 53 or 100% as the total count. Thus, the disclosure of biodiversity information was still low among Indonesian chemical companies.

These findings were in line with what [16] and [26] found about the low average environmental disclosure score among Indonesian companies. They also matched what [13] found about the low average score of biodiversity disclosure among Indonesian companies. It revealed that Indonesian chemical companies have not fully disclosed biodiversity and environmental-related information. Additionally, the score generated in this research has the lowest percentage of biodiversity disclosure among the other prior research mentioned.

Table 2. Descriptive Statistics of Biodiversity Disclosure Index

Categories	Min. Value	Max. Value	Mean	Std. Dev.
Report on current/previous actions (CPA) (max: 26)	0	17	2.45	0.64
Preventive actions (PAF) (max: 8)	0	1	0.05	0.15
Report on activities responsible for biodiversity loss (ELOSS) (max: 13)	0	8	1.00	0.30
Report on adopted statistics (FG) (max: 4)	0	1	0.11	0.04
Report on company fines (FIN) (max: 2)	0	0	0.00	0.00
Total in Count (max: 53)	0	27	3.60	0.92
Total in Score (max: 100%)	0.00	0.51	0.07	0.02

Table 3. Descriptive Statistics for Dichotomous Variables

Variables	N	Frequencies			
		0	%	1	%
The COVID-19 pandemic	85	34	40%	51	60%

Table 3 depicts that 60% of the observation years happened when the pandemic struck or during 2020–2022 (number 1), while 40% happened before the pandemic or during 2018–2019. Additionally, Table 4 illustrates the condition of the variables generated from the collected data. Family investors were considered dominant in Indonesian chemical companies with a value of 43%, despite still not reaching 51%, where the investors are deemed to become fully controlling shareholders. Although they only had 26% ownership on average, institutional investors also played a pivotal role in most Indonesian chemical companies. Hence, institutional investors also influence management's decisions in some way to disclose biodiversity information.

Table 4. Descriptive Statistics for Continuous Variables

Variables	N	Min. Value	Max. Value	Mean	Std. Dev.
Biodiversity Disclosure	85	0.00	0.51	0.07	0.12
Family Ownership	85	0.00	0.93	0.43	0.32
Institutional Ownership	85	0.00	0.99	0.26	0.34
Profitability	85	-0.20	0.26	0.03	0.06
Leverage	85	0.08	1.00	0.44	0.24

Table 4 also exhibits the profitability and leverage of Indonesian chemical companies. During 2018–2022, the companies experienced an average profitable condition of 3%. This condition was considered excellent due to the COVID-19 pandemic's strike from 2020 until 2022. Nevertheless, the level of leverage on average was 44% during 2018–2022. One interpretation would be that debt to creditors provided almost 50% of a company's capital. Hence, the companies have a high level of financial risk, and creditors have the power to influence management's decisions.

Table 5. The Determination of Estimation Model Output

Name of the Test	Name of the Value	Score	Criteria		Output
Chow test	Cross-section Chi-square	245.82698	Probability > 0.05	CEM	FEM

	Probability	0	Probability < 0.05	FEM	
Hausman Test	Cross-section random on Chi-square statistic	0	Probability > 0.05	REM	REM
	Probability	1	Probability < 0.05	FEM	
Lagrange Multiplier Tests	Breusch-Pagan on Cross-Section	139.93131	Probability > 0.05	CEM	REM
	Probability	0.00000	Probability < 0.05	REM	

4.2   Multiple Regression Analysis

Multiple regression analysis was conducted to determine the current research's relationship between dependent and independent variables. Three steps were used to perform the multiple regression analysis: determining the estimation model, performing the classical assumption tests, and performing the hypothesis test.

4.3   The Determination of Estimation Model

The collected data model was determined before being tested for classical assumptions. There are three possible estimation models of panel data: the common effect model (CEM), the fixed effect model (FEM), and the random effect model (REM). To determine the estimation model, [2] argued that panel data has to be examined by three tests: the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test.

Some criteria were set to determine the output of the estimation model between three possible models. Because the significant level used in the current research was 5%, 0.05 was used as the limit to determine the estimation. The Chow test considers the model CEM if the probability value exceeds 0.05. However, if it is less than 0.05, it is considered FEM. In the Hausman test, the model is considered REM if the probability value is more significant than 0.05 and FEM if the probability value is less than 0.05. Lastly, in the LM test, if the probability value is more significant than 0.05, the model is considered CEM, but if it is less, it is considered REM.

Table 5 shows that in the Chow test, the model generated in this research had a probability value of 0, less than 0.05. Therefore, the model was assumed to be FEM. However, in the Hausman test, the model generated a probability value of 1, which is greater than 0.05. Thus, the model changed to REM. Finally, the model was considered REM through the LM test because the probability value generated from the last test is 0, less than 0.05. Therefore, the model in this research was considered to have a random effect model (REM).

4.4   The Classical Assumption Test

Some researchers argued that it is not necessary to run the classical assumption tests on a model with REM [12] [22]. The action is legalised because REM uses generalised least squares (GLS) as its regression method. Therefore, the classical assumptions are considered fulfilled, and the model is free from the classical assumption problems. Nevertheless, this study still conducted two classical assumptions as a voluntary action: the test of multicollinearity and autocorrelation.

The Multicollinearity Test. The multicollinearity test detected a multicollinearity problem in the research data. [28] explained the multicollinearity problem as a highly correlated condition between independent variables. The current research used the correlation value to determine the problem. The correlation value shall not pass 0.80 to be defined as problem-free [10]. Hence, Table 6 shows no correlation value surpassed 0.80, and the research data did not suffer multicollinearity problems.

Table 6. The Multicollinearity Test Output

Variables	BDI	FO	IO	ROA	LEV	CP
BDI	1.00	0.08	-0.11	-0.11	0.11	0.12
FO	0.08	1.00	-0.76	0.07	-0.18	-0.02
IO	-0.11	-0.76	1.00	-0.12	-0.08	-0.02
ROA	-0.11	0.07	-0.12	1.00	-0.05	0.13
LEV	0.11	-0.18	-0.08	-0.05	1.00	-0.09
CP	0.12	-0.02	-0.02	0.13	-0.09	1.00

The Autocorrelation Test. The research data shall not experience an autocorrelation problem in the autocorrelation test. An autocorrelation problem is a condition in which the observation residual between variables is connected [32]. To detect the autocorrelation problem, this research implemented the Durbin-Watson method. Hence, the Durbin-Watson score generated from the research data should not exceed $du < d < 4 - du$, but in the range of 1.54 – 2.46. The Durbin-Watson score for the current study was 1.79 based on the Eviews analysis. Hence, the data did not suffer the autocorrelation problem.

The Hypothesis Test. The hypothesis test considers three kinds of values. The first one is the coefficient determination (R^2) to assess the goodness of the regression model. The second one is the F-test, which evaluates whether the independent variables, simultaneously or individually, affect the dependent variable significantly. The third one is

the t-test to assess whether the independent variables significantly affect the dependent variable.

Table 7 shows that the research model is significant at an F-value of 5.08 with a probability value 0. It could be interpreted that the independent variables impacted the dependent variable simultaneously or individually. The model also had an R-squared value of 24%. Nevertheless, the adjusted R-squared corrected it. Hence, the model could explain the biodiversity disclosure phenomenon by 19% using the variation of the independent variables included. Other variations of independent variables outside the model explain the remaining 81% of the biodiversity disclosure determinant. The adjusted R-squared value is still acceptable because it was more than 0.1 or 10%, and an independent variable significantly affected the dependent variable [24].

Table 7. The Hypothesis Test Output

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	0.19	0.07	2.86	0.00
FO	-0.17	0.08	-2.17	0.03
IO	-0.12	0.06	-1.80	0.07
ROA	-0.13	0.08	-1.63	0.11
LEV	-0.07	0.06	-1.15	0.25
CP	0.02	0.00	3.20	0.00
R-squared			0.24	
Adjusted R-squared			0.19	
F-statistic			5.08	
Prob (F-statistic)			0.00	

The t-value in Table 7 explains that, out of four independent variables and one control variable, only one independent variable and one control variable significantly impacted biodiversity disclosure. Family ownership negatively affected biodiversity disclosure. Hence, the percentage of family ownership, which was 43% on average, tends to restrain and decrease the quantity and quality of biodiversity disclosure. It proves that biodiversity disclosure is not a proper choice for family investors to make a more excellent image of their family and company. This output did not align with the assumptions of legitimacy and stakeholder theory. In legitimacy and stakeholder theory, the existence of family ownership shall increase biodiversity disclosure as one of several non-financial communications to increase the value of the company and to preserve the family's image from the public point of view. [1], who used signalling and agency theory, documented the same relationship regarding family ownership. They argued that the dominant role of family investors resulted in strict monitoring conditions for the company's management and decisions. Hence, disclosing biodiversity or other non-financial information wastes sources if the family investors do not see it as necessary.

Institutional ownership, profitability, and leverage insignificantly affected biodiversity disclosure. The existence of institutional investors, 26% on average, did not have

enough power to impact the quantity or quality of biodiversity disclosure. This condition also depicted that biodiversity matters have not become a priority for institutional investors [26]. They chose to prioritise another aspect that could visibly increase their welfare. Despite the values being 3% and 44% on average, simultaneously, the profitability and leverage did not properly motivate the companies to distinguish themselves from other poor-performance companies regarding biodiversity disclosure. It also showed that creditors had no control over a company in disclosing biodiversity information. Hence, companies focus more on managing their financial risk due to the high level of leverage.

The COVID-19 pandemic had a positive significant relationship with biodiversity disclosure. Thus, the pandemic increases companies' awareness of the importance of biodiversity in the industry. The COVID-19 pandemic happened due to human careless intervention in nature, which was the activity of consuming bats as wild animals. Hence, to increase accountability and transparency, as well as not be considered recklessly ignoring their impact on nature and biological diversity, companies were starting to increase the quantity and quality of their disclosure on biodiversity information.

The current research documented that Indonesian chemical companies' average biodiversity disclosure index score was 7%. However, [13] output on the biodiversity disclosure score for Indonesian companies listed in the SRI-KEHATI Index during 2018 - 2022 was 36.75% on average. This condition showed that the biodiversity disclosure of Indonesian chemical companies was still far below the average score of Indonesian companies, even before the pandemic struck. Hence, even though the output of the relationship between the COVID-19 pandemic and biodiversity disclosure in the hypothesis test of this research could be interpreted as increasing awareness of the companies, the awareness is still far from the ideal disclosure level for Indonesian companies. As a result, Indonesian chemical companies are still required to increase their focus on biodiversity disclosure.

5   Conclusion

The current research studied the determinants of biodiversity disclosure in Indonesia. By adopting the legitimacy and stakeholder theory assumptions, biodiversity disclosure was considered the dependent variable, family ownership, institutional ownership, profitability, and leverage were the independent variables, and the COVID-19 pandemic was the control variable. The employment of those variables was intended to prove and broaden the discussion of previous research, especially in the scope of Indonesia.

The population of this research was the go-public Indonesian chemical companies. Hence, the sample was picked from chemical companies listed in IDX during 2018–2022. The panel data regression was used to analyse the data, which was identified as having a random effect model (REM) and had to employ the GLS regression analysis. In the current research, the Eviews student edition version 12 software programme was utilised to help with the analysis.

As a result of the analysis, Indonesian chemical companies have not paid proper attention to biodiversity. Furthermore, the assumption of legitimacy and stakeholder theory could not be fully applied in the current research because of the contradiction of the output. Family ownership had a negatively significant relationship with biodiversity disclosure. Hence, the dominance of family ownership in a company tends to restrain and decrease the quantity and quality of biodiversity disclosure. The other variables, such as institutional ownership, profitability, and leverage, did not affect biodiversity disclosure. Only the positive relationship of the COVID-19 pandemic to biodiversity disclosure implemented the legitimacy and stakeholder theory assumptions. That was because the pandemic raised companies' awareness of the importance of biodiversity. Hence, the companies tried to legitimate themselves in the public's eye.

Several limitations were experienced when performing the current research. First, the industry used for this research did not provide maximum biodiversity disclosure. Hence, future research might choose or mix some industries that visibly utilise natural resources, e.g., mines, forestry, fisheries, or agriculture. Second, some chemical companies did not fully disclose their company's information despite already becoming a public company. Thus, companies should also try to manage their communication with the public because it is considered one of many companies' stakeholders. Third is the repetition of biodiversity information disclosed in a company's annual and sustainability reports. Therefore, future research might want to consider the company website as an additional instrument of biodiversity disclosure, not just through the company reports.

The current study contributed to the existing research, regardless of its limitations. The contribution is divided into theoretical, practical, and social aspects to simplify the explanations. For the theoretical contribution, the current research gave a new perspective on environmental disclosure literature in Indonesia, specifically on biodiversity, which was still few at the time of the article's writing. In the practical aspect, the current study reminds companies to pay more attention to their environmental disclosure, including biodiversity. Additionally, this research urges the government to strengthen the monitoring of companies' disclosures related to financial and non-financial information. Last but not least, in terms of the social aspect, the current research encourages the general public and business stakeholders to pay close attention to any environmental information that a company discloses, including biodiversity disclosure, because family investors are the ones who reduce the quantity and quality of biodiversity disclosure, according to the current research.

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