

THE IMPACT OF COMPANY SIZE, PROFITABILITY, INDUSTRY TYPE, LEVERAGE, AND ENVIRONMENTAL PERFORMANCE ON CARBON EMISSION DISCLOSURE

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ABSTRACT

The study aims to analyze the impact of company size, profitability, industry types, leverage, and environmental performance on carbon emission disclosure. The research population is all manufacturing company listed on the Indonesian Stock Exchange (IDX) during the period 2019-2022. Sampling method in this study uses purposive sampling techniques with specific criteria. The number of samples obtained amounted to 56 data. This type of research is quantitative research. This research data analysis method uses multiple regression analysis techniques. The data used in this study are secondary data derived from the annual reports and sustainability reports of the company contained on the website www.idx.co.id and the related company web. The research was processed using the SPSS 25 application. The result of this study show that profitability, industry types, and leverage have an impact on carbon emission disclosures, while company size and environmental performance have no impact on carbon emission disclosure.

Keywords : company size, profitability, industry types, leverage, environmental performance, carbon emission disclosure

INTRODUCTION

Today, global warming and the risk of climate change are significant issues for companies. Global warming is an increase in the average temperature of the air near the Earth's surface and oceans that has occurred since mid-19th century and is projected to continue. The majority of the temperature increase observed since the mid-20th century is due to the sharp increase in greenhouse gas concentrations (Astuti, 2021). The amount of greenhouse gas (GHG) emissions in Indonesia in 2021 was 259.1 million tons of CO₂ and the amount is projected to increase by 29.13% to 334.6 million tons of CO₂ in 2030 (Rizaty, 2022). The increase in carbon emissions is increasingly worrying, so efforts need to be made to reduce or even eliminate carbon emissions, including in Indonesia. Indonesia's step in maintaining economic growth is to make a green economy transition that prioritizes low-carbon development that is inclusive and equitable. To achieve this transition, Indonesia has committed to reduce GHG emissions in 2030 by 29% under business as usual conditions and if it receives support and cooperates internationally, it can increase to 41%. Indonesia has planned and implemented several strategic steps in several climate change critical sectors, namely the Forestry and Other Land Uses (FOLU) sector, energy, agriculture, waste management, and Industrial Process And Product Uses (IPPU) (Limanseto, 2021). In addition,

to overcome the increase in CO₂, carbon emission disclosure can be carried out by a company that establishes its business.

The phenomenon that occurs in companies listed on the Indonesia Stock Exchange (IDX), only 30% of companies that make sustainability reports. Indonesia has a higher ranking compared to South East Asia, Latin America and Africa, this is because the population in Indonesia is quite large and the level of corporations is much more advanced. However, Indonesia is still inferior when compared to Europe and America. From this phenomenon, it can be interpreted that companies in Indonesia are still relatively low in making sustainability reports compared to Europe and America. This may be due to companies' ignorance that sustainability reports are required by law and the fact that producing. This study focuses on the factors that influence the disclosure of carbon emissions with the object of research using a sample of manufacturing companies listed on the Indonesia Stock Exchange (IDX). The selection of this sector is done with the consideration that manufacturing companies in the company's operational activities provide quite a lot of carbon emissions. According to IMF data, the manufacturing sector contributes GHG emissions of 149.2 million MT CO₂e (Rizaty, 2023). As the manufacturing sector contributes a significant amount of emissions, it is required to minimize the impact of carbon emissions. This is in accordance with the provisions of Presidential Regulation No. 61/2011 on the National Action Plan for Reducing Greenhouse Gas Emissions (Andriadi & Werastuti, 2020).

This research is a development of research (Putri & Amin, 2022). In this study add industry type and environmental performance as independent variables. Industry types are added to find out whether all types of industries have already made carbon disclosure as their social responsibility or only a particular type of industry does carbon disclose. The reason added to the environmental performance variable is because the company's operations are a contributing factor to environmental damage, one of the chemicals and emissions contained in the raw materials and equipment so that it can be known environmental performances that how can carry out carbon emissions disclosure (Maulidiavitasari & Yanthi, 2021). The researchers intend to re-verify previous research results on the various factors that influenced the disclosure of carbon emissions. So, the purpose of the researchers is to analyze the impact of company size, profitability, industry types, leverage, and environmental performance on carbon emission disclosure for manufacturing companies listed in the IDX in 2019–2022.

THEORITICAL REVIEW

Legitimation Theory

According to Fernando & Lawrence (2014), the theory of legitimacy shows that it is important for an organization to ensure that the business they run is in line with social norms and contracts in order to gain legitimacy in society (Pranasyahputra et al., 2020). A company can obtain legitimacy if its activities are in line with applicable restrictions and norms. A company tends to pursue a strategy to gain legitimacy in society by disclosing environmental information and its environmental-based performance. According to Dowling & Pfeffer (1975), the theory of legitimacy is a theory that deals with the relationship between a company and its environment. The theory explains that legitimacy arises from the presence of a perception of the legitimacy of an institution regarding a status or condition that arises when the company's norm scheme is in line with the existing scheme of social norms (Ayu Laksani et al., 2020). What a company can do to protect its legitimacy is to carry out voluntary disclosures like carbon disclosure. (Abdullah et al., 2020) has proved that big companies are faced with public urges to increase the disclosure of corporate information. Besides, intensive companies also need to disclose carbon emissions as a form of company responsibility. This is done by a company in order to form or enhance a positive image or image to gain legitimacy from stakeholders or the community in which the company operates (Ratmono, 2019).

Carbon Emission Disclosure

According to Borduas & Donahue (2018), carbon emissions are the release of gases that carry carbon into the Earth's atmosphere as a result of the carbon combustion process (Maulidiavitasari & Yanthi, 2021). The increase in carbon emissions that occurs every year in the atmosphere drives world governments and Indonesia to issue regulations that encourage or industries to reduce emissions through carbon disclosure. Carbon Emission Disclosure is a voluntary environmental disclosure. This disclosure can be found in an annual report or a company's sustainability report. Carbon disclosure covers greenhouse gas emissions intensity and energy use, corporate governance and strategies in relation to climate change, achievement of targets for greenhouse-gas emission reduction, risks and opportunities associated with climate-change impacts (Rusdi & Helmayunita, 2023).

Company Size

The size of a company is the ratio of the size of one company to another. A representation of the size of the company is seen from the total assets or net sales of a company. The greater the amount of assets it holds, the greater it is, and the larger it is; but the smaller the assets of the company, the lesser it is (Rusdi & Helmayunita, 2023). The size of the company can be

calculated using the natural logarithm of the total assets (Ln Assets) of the active and non-active assets contained in the annual report.

Profitability

Profitability is a comparison that measures the ability of a company to generate profits with the amount of assets or wealth of the company. A profitability ratio serves to determine the ability to generating profits from the company's operational activities. In addition, a profitability ratios can be used to determine how efficient management is in carrying out the business activities of the firm (Septriyawati & Anisah, 2019).

Industry Type

The type of industry of a company is closely related to the volume of carbon emissions produced by an entity. The Global Industry Classification Standard (GICS) classifies the type of industry that is based on the main activities carried out by an enterprise, such as the intensive industrial type and the non-intense industrial type. Intensive industrial type enterprises are enterprises whose main activities are directly related to environmental sustainability. Enterprises that fall into this category are mining, energy, materials, utilities, and transportation enterprises. Non-intensive industrial types are companies with lower emission volumes compared to the intense industrial types (Ramadhani & Venusita, 2020).

Leverage

Leverage is a ratio that can indicate how a company is capable of fulfilling its obligations, both in the short and long term. The leverage ratio functions to determine the size of the company's debt composition, in financing the company's activities whether the company uses more of its debt or assets (Rusdi & Helmayunita, 2023). Leverage relates to financing that can directly impact a company's decision to implement voluntary carbon disclosure.

Environmental Performance

Environmental performance is an effort made by a company to create better environmental conditions (Hilmi et al., 2020). A company's environmental performance can be proxied through PROPER (Company Performance Rating Assessment Program in Environmental Management). The higher the PROPER score obtained by a company, the higher the level of environmental coverage. Companies carry out environmental disclosures so that the trust given by the community is maintained and the company gains legitimacy from the community (Sekarini & Setiadi, 2021).

METHODS

The type of research used in this study is quantitative research using secondary data derived from the company's financial statements contained in the website www.idx.co.id and the official website of the relevant company. The data analysis technique used in this study uses multiple regression analysis. The population in this study are manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2019-2022. The sampling method used in this study was purposive sampling, for determining the sample with certain criteria and considerations. The results of the selection of sample criteria can be seen in table 1.

Table 1. Research Sample

NO	CRITERIA	AMOUNT
1	Manufacturing companies listed on the IDX in the period 2019-2022	228
2	Manufacturing companies that are not listed on the IDX consecutively in the 2019-2022 period	-44
3	Manufacturing companies that did not report annual reports and sustainability reports consecutively in the period 2019-2022	-161
4	Manufacturing companies that do not participate in PROPER	-9
Total Company		14
Total research sample x 4 years		56
Total sample that can be processed		56

Source: Processed by researchers, 2023

According to the above table, the population of companies listed on the Indonesian Stock Exchange amounts to 228 companies. However, after applying some criteria, the number of samples obtained was 56 company data. This study uses the measurement items for each variable as follows:

Tabel 2. Variable Measurement

Variable	Measurement	Source
Carbon Emission Disclosure	CDP checklist items consisting of five groups with 18 items in them. These checklist items are scored 1 point for each item when the disclosure has been published; if not disclosed scored 0. Calculation: $CED = \frac{\text{Total items disclosed}}{\text{Total items specified}}$	(Rusdi & Helmayunita, 2023) and (Putri & Amin, 2022)
Company Size	$SIZE = LN(\text{Total Assets})$	(Putri & Amin, 2022)

Profitability	Return On Assets = $\frac{\text{Net profit after tax}}{\text{Total Assets}}$	(Ayu Laksani et al., 2020)
Industry Type	Using the dummy variable, a value of 1 is given to companies that are part of an emission-intensive industry, namely companies in the energy, transportation, material and utility sectors, whereas the value of 0 is given for companies outside the previously mentioned sectors.	(Ramadhani & Venusita, 2020)
Leverage	Debt to Asset Rasio = $\frac{\text{Total Debt}}{\text{Total Assets}}$	(Sekarini & Setiadi, 2021)
Environmental Performance	Use the proper rating. Where the color Gold = 5, Green = 4, Blue = 3, Red = 2, Black = 1, and Nihil = 0.	(Maulidiavitasari & Yanthi, 2021)

Source: Processed by researchers, 2023

According to (Sugiyono, 2013) data analysis in quantitative research is an activity after data from all respondents or other data sources is collected. Data analysis methods in this study include descriptive statistical tests, classical assumption tests, multiple linear regression tests, and hypothesis tests. Data processed using SPSS 25 software. Here is the regression equation of this study :

$$\text{CED} = \alpha + \beta_1\text{UP} + \beta_2\text{P} + \beta_3\text{TI} + \beta_4\text{L} + \beta_5\text{KL} + \varepsilon$$

Description:

CED = Carbon Emission Disclosure

α = Constant

β_1 - β_5 = Regression Coefficient

UP = Company Size

P = Profitability

TI = Industry Type

L = Leverage

KL = Environmental Performance

ε = Error

RESULT AND DISCUSSION

Deskriptive Statistical Test

Table 1. Descriptive Statistical Test

N	Minimum	Maximum	Mean	Std. deviation
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Company Size	56	27,53	33,66	30,6273	1,55495
Profitability	56	-0,45	0,36	0,0743	0,12800
Industry Type	56	0,00	1,00	0,4286	0,49935
Leverage	56	0,13	1,40	0,4713	0,25952
Environmental Performance	56	3,00	5,00	3,5893	0,68162
Carbon Emission Disclosure	56	0,28	0,83	0,6280	0,12797

Source: Processed by researchers, 2023

Based on the above table, it can be explained that the total sample (N) of the research is 56 companies. Each variable can be interpreted as follows:

1. Carbon Emission Disclosure

The minimum value on the carbon emission disclosure variable is 0.28 obtained by PT Astra International Tbk (ASII), while the maximum value is 0.83 obtained by PT Indocement Tunggal Prakarsa Tbk (INTP). The average variable carbon emission report is 0.6280 and the standard deviation is 0.12797. Disclosure of emissions to manufacturing companies is not too low but not too high anyway.

2. Company Size

The minimum value on the company size variable is 27.53 obtained by PT Merck Indonesia Tbk (MERK), while the maximum value is 33.66 acquired by PT Astra International Tbk (ASII). The average variable value is 30.6273 and the standard deviation value is 1.55495.

3. Profitability

The minimum value on the profitability variable is of -0,45 obtained by PT Waskita Beton Precast Tbk (WSBP), while the maximum value of 0.36 obtains by PT Unilever Indonesia Tbk (UNVR). The average value of the variable of profitability is of 0.0743 and the standard deviation value is of 0.12800.

4. Industry Type

The minimum value for the industrial variable is 0.00, the maximum value is 1.00, the average value for industrial variables is 0.4286 and the standard deviation value is 0,49935. The sample companies in this study mostly have a non-intensive type of industry.

5. Leverage

The minimum value on the leverage variable is 0.13 obtained by PT Jamu Industries and Pharmaceuticals Sido Tbk (SIDO), while the maximum value is 1.40 obtaining by

PT Waskita Beton Precast Tbk (WSBP). The average value of the variable leverage is 0.4713 and the standard deviation value is 0.25952.

6. Environmental Performance

The minimum value on the environment performance variable is 3.00, the maximum value is 5.00, the average value of the environmental performance variables is 3.5893 and the standard deviation is 0.68162. The sample companies tend to have a high PROPER index.

Classical Assumption Test

Normality Test

Normality test is used to determine whether the data is distributed normally or not. In this study, the normality test uses the Central Limit Theorem (CLT) test, which means that if the number of observations is large enough ($n > 30$), then the assumption of normality can be ignored (Gujarati, 2003). This study is the number n equal to 56, then $n > 30$. It suggests that the data can be said to be distributed normally.

Multicollinearity Test

Table 2. Tolerance and VIF Test

Variable	Tolerance	VIF	Information
Company Size	0,866	1,155	No Multicollinearity
Profitability	0,687	1,456	No Multicollinearity
Industry Type	0,553	1,809	No Multicollinearity
Leverage	0,768	1,302	No Multicollinearity
Environmental Performance	0,763	1,311	No Multicollinearity

Source: Processed by researchers, 2023

Based on table 2, it is seen that the tolerance values and the VIF values of all independent variables indicate the value of $VIF \leq 10$ and tolerance value $\geq 0,10$. So, it can be concluded that there is no multicollinearity between independent variables in the regression model.

Autocorrelation Test

Table 3. Run Test

Variable	Asymp. Sig. (2-tailed)	Information
Unstandardized Residual	0,059	No Autocorrelation

Source: Processed by researchers, 2023

Based on table 3, it can be seen that the Asymp. Sig. (2-tailed) value is 0.059. This means that the asymp. Sig. (2-tailed) value is > 0.05 (taraf signifikansi). So it can be concluded that there is no autocorrelation.

Heteroscedasticity Test

Table 4. Spearman-Rho Test

Variable	Sig. (2-tailed)	Limit	Information
Company Size	0,272	$> 0,05$	No Heterokedasticity
Profitability	0,906	$> 0,05$	No Heterokedasticity
Industry Type	0,987	$> 0,05$	No Heterokedasticity
Leverage	0,587	$> 0,05$	No Heterokedasticity
Environmental Performance	0,907	$> 0,05$	No Heterokedasticity

Source: Processed by researchers, 2023

Based on the spearman-rho test on table 4, there is information that all variables have significance values > 0.05 . So it can be concluded that the regression model does not have heterocadasthesis.

Hypothesis Test

Multiple Linear Regression Test

Table 5. Hypothesis Results

Variable	Unstandardized Coefficients		Standard Coefficients	T	Sig.	Description
	B	Std. Error				
(Constant)	0,416	0,320		1,302	0,199	
UP (Company Size)	0,006	0,010	0,079	0,647	0,520	H1 rejected
P (Profitability)	0,296	0,137	0,296	2,168	0,035	H2 accepted
TI (Industry Type)	0,160	0,039	0,624	4,096	0,000	H3 accepted
L (Leverage)	-0,142	0,064	-0,288	-2,227	0,030	H4 accepted

KL (Environmental Performance)	-0,003	0,024	-0,016	-0,120	0,905	H5 rejected
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F = 5,606

Sig F = 0,000

Adjusted R Square = 0,295

Source: Processed by researchers, 2023

Based on the coefficients table above, the regression equation is:

$$CED = 0,416 + 0,006UP + 0,296P + 0,160TI - 0,142L - 0,003KL + \varepsilon$$

The result can be interpreted as follows:

1. The constant value (α) has a positive value of 0.416. This positive sign indicates that there is a directional impact between the independent variable and the dependent variable. This suggests that the company size, profitability, industry type, leverage, and environmental performance variables are constant or unchanged, so the CED value will increase by 0.416.
2. The regression coefficient value for the Company Size variable (X1) has a positive value of 0.006. This indicates that if the company size increases by 1%, then the Carbon Emission Disclosure will increase by 0.006 assuming the other independent variables are considered constant.
3. The regression coefficient value for the Profitability variable (X2) has a positive value of 0.296. This indicates that if profitability increases by 1%, then Carbon Emission Disclosure will increase by 0.296 assuming the other independent variables are considered constant.
4. The regression coefficient value for the Industry Type variable (X3) has a positive value of 0.160. This indicates that if the industrial type has an increase of 1%, then the Carbon Emission Disclosure will increase by 0.160 assuming that the other independent variable is considered constant.
5. The regression coefficient value for the Leverage variable (X4) is -0.142. The value indicates a negative influence which means the opposite direction between the variable leverage and the Carbon Emission Disclosure variable. This indicates that if the leverage variable has an increase of 1%, then the carbon emission disclosure will have a decrease of 0.142 on the assumption that the other independent variables remain constant.

6. The regression coefficient value for the Environment Performance variable (X5) is - 0,003. This indicates that if the environmental performance variable increases by 1%, then the carbon emission disclosure will decrease by 0.003 on the assumption that the other independent variable remains constant.

Adjusted R Square

Table 5 shows the adjusted R Square value of 0.295, meaning that the variables Company Size, Profitability, Industry Type, Leverage, and Environmental Performance simultaneously (together) impact the variable Y (Carbon Emission Disclosure) by 29.5%, while the remaining variable (70.5%) is determined by other variables outside the regression equation.

F Test (Model Feasibility)

Based on table 5, the validity of the research model can be determined from the F value of the table or the sig value. To find the value of the table F can be done in the following way: Knowing the sample number of research (n) = 56, the number of independent variables (k) = 5, Sig (assuming researchers) using 0.05. (5; 51). Based on table F obtained the value of table F 2.40. Then compare the F-table value with the F-count. The value of F - count 5,606 > F - table (2,40) that the hypothesis is accepted. This means that the X (independent) variable collectively has an impact on the Y (dependent) variable in the regression equation. This means that the research model is robust.

DISCUSSION

The impact of company size on carbon emission disclosure

The first hypothesis in this study is company size has an impact on carbon emission disclosure. Based on the test results, a variable coefficient value of 0.006 and a significance level of 0.520, which means greater than 0.05. The results of this study showed that the company size variable has no impact on carbon emission disclosure. This contradicts the theory of legitimacy that states that large corporations will get a lot of public pressure which causes a company to increase the disclosure of corporate information to build a good social image and gain legitimacy from the public compared to a small company. The size of companies, whether large or small, has not been considered an important factor in carbon disclosure. Large companies feel that doing voluntary disclosures related to carbon emissions is ineffective and does not add value. As a result, non-financial companies in Indonesia preferred to focus on other types of

disclosure in order to increase public recognition (Sadira Ashia Priliana & Ermaya, 2023) The results of this study are in line with the research carried out by (Septriyawati & Anisah, 2019) which explains that the size of the company has no impact on carbon emission disclosure due to the view of large companies that have not considered the effectiveness of their voluntary disclosures.

The impact of profitability on carbon emission disclosure

The second hypothesis in this study is profitability has an impact on carbon emission disclosure. Based on the test results obtained variable coefficient value of 0.296 and the significance level of 0.035 which means less than 0.05. The results of this study show that the profitability variable has an impact on carbon emission disclosure. This is in line with the theory of legitimacy that states that companies with high rates of profitability will be able to meet the pressure of stakeholders that give legitimacy to undertake improved environmental management compared to companies with low rates of profits. Companies with high levels of profit are better prepared to manage and allocate resources into wider environmental disclosure, as well as run corporate operations with a greater focus on concern for the environment. Thus, when a company voluntarily discloses carbon emissions, it indicates that the company is in good shape. Simply put, less profitable companies tend to be less transparent in disclosing carbon emissions (Hamdiyani, 2023). The results of this study are in line with a study conducted by (Apriliana et al., 2019) that explains that profitability has an impact on carbon disclosure. This is because companies with high profitability are considered more open-ended and easy to do voluntary disclosures compared to companies with low profitability.

The impact of industry types on carbon emission disclosure

The third hypothesis in this study is industry types have an impact on carbon emission disclosure. Based on the test results obtained variable coefficient value of 0.160 and the significance level of 0,000 which means less than 0.05. The results of this study showed that industry type variables have an impact on carbon emission disclosure. This is in line with the theory of legitimacy that the incentive industry company fulfils its social responsibility by disclosing emissions in order to provide information that is useful to the company in raising its reputation among the public. This is in line with research conducted by (Rusdi & Helmayunita, 2023) and (Fatkhil Asri Mulya, 2020) that explains that the type of industry has a positive and significant impact on carbon emission disclosure. Companies with high emission intensities get more pressure from the authorities to comply with existing environmental regulations than companies with low emissions intensities. This is because emission-intensive companies will

have more impact on the environment so that companies with high carbon intensity will be more transparent in disclosing their emissions. Moreover, stakeholders or customers with high environmental awareness can also be one factor in causing intensive to disclose their emission. The company is intensely disclosing its emissions to maintain its competitiveness and corporate image.

The impact of leverage on carbon emission disclosure

The fourth hypothesis in this study is leverage has an impact on carbon emission disclosure. Based on the test results obtained variable coefficient value of -0,142 and the significance level of 0.030 which means less than 0.05. The results of this study show that the variable leverage has an impact on carbon emission disclosure. The value of the regression coefficient of the variable leverage is -0,142 indicates the negative relationship direction which means the higher the leverage value, the lower the dependent variable value. Companies will be able to make voluntary disclosures when they have good operational performance. Good operating performance can be seen from low leverage levels. When the leverage level is high, the company will have difficulty in making voluntary revelations because of cost barriers. This is in line with the theory of legitimacy that states that companies with good operational performance will commit to addressing social and environmental issues so that companies gain legitimacy. This study is in line with a study conducted by (Zanra et al., 2020) that states that companies with a high leverage will have difficulty in disclosing carbon emissions. Similarly, when a low leverage of a company will increase or make it easier for a company to disclose carbon emission because it has more corporate funds.

The impact of environmental performance on carbon emission disclosure

The fifth hypothesis in this study is environmental performance has an impact on carbon emission disclosure. Based on the test results obtained variable coefficient value of -0,003 and significance level of 0.905 which means greater than 0.05. The results of this study show that environmental performance variables have no impact on carbon emission disclosure. This contradicts the theory of legitimacy which assumes that the higher the PROPER value, the higher its emission disclosure rate. Companies that have a high PROPER rating can't do high emission disclosures because they've already gained public legitimacy about the company's good image. This is in line with a study conducted by (Apriliana et al., 2019) which explains that environmental performance has no impact on carbon emission disclosure because companies that get a high PROPER rating feel no need to make carbon disclosures because they judge that their company's performance is already good in order to reduce carbon

emissions. The study (Suhardi & Purwanto, 2015) also explained this ineffectiveness due to the PROPER rating that focuses on issues of natural resource conservation, environmental management systems, and CSR implementation. PROPER do not give primary emphasis to issues related to global warming or climate change. As a result, PROPER as an environmental performance indicator does not impact carbon emission disclosure.

CONCLUSION

Based on previous analysis and discussion, it can be concluded that company size has not impact on carbon emission disclosure and **H1 is rejected**. The results of the study show that profitability has an impact on carbon emissions disclosures and **H2 is accepted**. The results of the study show that industry types has an impact on carbon emissions disclosures and **H3 is accepted**. The results of the study show that leverage has an impact on carbon emissions disclosures and **H4 is accepted**. The results of the study show that environmental performance has not an impact on carbon emissions disclosures and **H5 is rejected**.

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