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The Effect of Corporate Performance and Corporate Governance on Manufacturing Company Carbon Emission Disclosure

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Abstract: The aim of this study is to examine the effect of company performance and corporate governance on the disclosure of carbon emissions of manufacturing companies. This study uses secondary data in the form of financial reports and sustainability reports from manufacturing companies that have been listed on the Indonesia Stock Exchange (IDX) for the period 2015 -2022. The data collection technique used a purposive sampling method with a sample of 93 companies. Data analyzed by using panel regression method. The results of this study show that company performance variables have a significant positive effect on disclosure of carbon emissions, but corporate governance variables do not have a significant negative effect on carbon emissions. The study suggests corporate governance will reduce the company's carbon emission levels. Hence, it is very important to enhance the company's corporate governance practices beyond the mandatory matters. This study is one among few studies which have been conducted in Indonesia to examine company performance and corporate governance regarding carbon emissions in the manufacturing industry in Indonesia. This study focuses on examining the manufacturing industry in Indonesia and this research has different results and points of view from previous researches.

Keywords: carbon disclosure, carbon emissions, corporate governance, corporate performance, Indonesia Stock Exchange (IDX).

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INTRODUCTION

Global warming and climate change have become a problem that continues to grow as a problem for the world (Kılıç & Kuzey, 2019). Greenhouse gas emissions, especially carbon dioxide, are a major cause of climate change (Shen et al., 2020). Continuous weather changes can cause a global warming phenomenon that is triggered by the irregular accumulation of greenhouse gas emissions into the atmosphere, which is potentially disruptive and irreplaceable (Gabrielle & Toly, 2019). Moreover, the problem of global warming can be influenced by an increase in human population which causes the production of carbon emissions and CO2 carbon dioxide to

increase (Gobel et al., 2019). Carbon emissions influenced by humans have increased to more than 400 billion tons/CO2 since 1751 based on the results of research conducted by the Carbon Dioxide Information Analysis Center (Hilmi et al., 2020).

Furthermore, based on the results of data processing carried out by IQAir in 2020, Bangladesh is the country with the highest air pollution, with an average of 77.10 µg/m3 and several other countries have carbon emission values that fall into the unhealthy for sensitive groups category (Suwandi et al., 2022). and according to World Bank data in 2020, the value of carbon emissions throughout the world has increased drastically by 93.51% from 1970–2012 (Noor & Saputra, 2020). Therefore, the problem of greenhouse gas emissions needs to be considered and studied in stages and one of the keys to reducing carbon dioxide emissions is implementing good weather change management (Shen et al., 2020).

Weather changes that often occur can put pressure on systems, populations, and regions (Ebi, 2020; Tong & Ebi, 2019; Watts et al., 2018) which are seen as reducing the health of the world's people and have become an important problem for the whole world (Butler, 2018). Therefore, an international organization was formed, namely the Intergovernmental Panel on Climate Change (IPCC) an organization that was built thanks to the collaboration of the United Nations (UN) and the World Meteorological Organization which aims to tackle weather problems (Nasih et al., 2019). From 1906 to 2005, the IPCC has collected data explaining that global temperatures have increased by a range of 0.74°C, the level of land surface temperatures exceeds that of the oceans, and in the last 50 years the temperature level has doubled by 100 last year (IPCC-Intergovernmental Panel on Climate Change, 2009).

Observing these facts, the Government of Indonesia is obliged to pay attention to this to minimize changes in global temperature. Indonesia is the fourth highest per capita emission contributor country in the world after China, the United States, and the European Union in 2005 (Freedman & Jaggi, 2011). Apart from that, in 2019, according to data held by the World Bank, in 2022, Indonesia has recorded 2.50 billion tons/CO2 (Karunia et al., 2023). Countries that have high carbon emissions can have an impact on the sustainability of domestic companies, for example in terms of finance and determining the company's market base (Miah et al., 2021). For domestic companies, carbon emissions are a form of disclosure (voluntary disclosure) owned by the company to be a way for the company to reveal the efforts the company is making to deal with environmental factors, especially the impact of carbon emissions (Trufvisa & Ardiyanto, 2019). Companies that disclose carbon emissions information tend to apply sustainability processes or principles into company strategy and operations so that investors can consider information about carbon emissions as important information in determining investment decisions (Park et al., 2014).

Furthermore, industries with large carbon profiles are required to pay a higher carbon premium from the Emission Trading Scheme (ETS) (Miah et al., 2021). Not only that, people are increasingly paying attention to the environment and social issues in using products and services from companies (Frias-Aceituno et al., 2013). Environmental issues are an important component of organizational governance goals to be able to maintain the climate and ethics as a whole (Peters & Romi, 2014). This is in line with the Instrumental Stakeholder Theory (IST) which stated high ethical relationship of the firms with their stakeholders are characterized by high levels of information sharing, cooperation, and trust (Jones et al., 2018). IST also argue that firms' ability to manage their stakeholders can provide a competitive advantage which ensures their performance in the long-run (Daromes et al., 2023; Laplume, 2021; Rukmiyati et al., 2023; Verma & Mukhtaruddin, 2023).

Thus, in this case the company must pay attention to how to manage information about the company's strategy and activities, both in terms of performance and other factors such as the environment. Based on the results of some studies above, it is necessary to looking at the impact of carbon emissions on the company's

financial performance and market base. Apart from that, companies that experience an increase in profitability will encourage companies to make disclosures, one of which is disclosing carbon emissions to gain interest from investors (Florencia & Handoko, 2021; Javed et al., 2023). Issues regarding carbon emissions carried out by Gonzalez & Ramírez (2016) and Kılıç & Kuzey (2019) using the objects of developed countries such as Turkey and Spain where in developed countries, most are already aware of the responsibility for increasing carbon stocks in the atmosphere (Miah et al., 2021). Meanwhile, developing countries such as China (BRICs), India and Russia have faced rapid spikes in GDP growth rates resulting from higher productivity and economies that require large energy inputs to maintain a steady pace of economic growth (Miah et al., 2021). These combined effects lead to higher carbon emissions in the atmosphere (Appiah et al., 2019; Sadorsky, 2014).

Research on carbon emissions, corporate governance and company performance conducted by Nasih et al. (2019) and Trireksani & Djajadikerta (2016) using industrial types such as mining and agriculture in Indonesia where the mining industry such as oil, coal and gas is the highest contributor to carbon emissions in developing countries including Indonesia while the agricultural industry has contributed to the growth of carbon emission levels by 54% since 2000 (Nasih et al., 2019). There is still limited research that examines this, especially in other sectors such as manufacturing in Indonesia. Therefore, this study focuses on examining the manufacturing industry in Indonesia and this research has different results and points of view from previous researches because the manufacturing industrial sector is an industry that implements different carbon emission management because manufacturing companies have activities that can affect the surrounding environment and Manufacturing companies have a relatively large number in Indonesia compared to other companies (Urmila & Mertha, 2017), coupled with the pressure arising from society where people will hesitate to use products and services that are not friendly to the environment.

Previous research was conducted by Gonzalez & Ramírez (2016) using a research sample of companies in Spain listed in the FT500, DJSI and IBEX 35 indexes, further research was conducted by Odoemelam & Okafor (2018) using research samples of companies listed on the Nigeria Stock Exchange (NSE). In addition, research conducted by Miah et al. (2021) researched the financial and non-financial sectors using research samples in developing countries recorded from the Datastream database from the 2011–2020 period. Whereas in this study specifically focuses on manufacturing industry companies in Indonesia that are listed on the Indonesia Stock Exchange (IDX) throughout 2015–2022.

The problem of this study is whether company performance and corporate governance can influence carbon emissions in manufacturing industrial companies. Therefore, the issues in this study are: (1) Can company performance influence the carbon emissions of manufacturing industrial companies? and (2) Can corporate governance influence the carbon emissions of manufacturing industry companies? This study has a specific objective, namely, to examine company performance and corporate governance regarding carbon emissions in the manufacturing industry in Indonesia. Apart from that, the industrial side is intended to be used as material for correcting, improving, maximizing, motivating and increasing the value of the company as well as managing carbon emissions well in the coming year.

METHODS

The population in this study are all companies in the manufacturing sector that are listed on the Indonesia Stock Exchange (IDX) during the 2015–2022 period. In ascertaining the sample, this study used a purposive sampling method, namely a technique in obtaining a sample by reviewing several specific parameters to be placed as a sample. The sample selection procedure for manufacturing sector companies can be seen in Table 1.

Table 1 Sample Selecting Procedure

No	Criteria	Company Totals
1	Manufacturing sector companies listed on the Indonesia Stock Exchange in 2015–2022.	204
2	Manufacturing sector companies have published audited financial statements for the period 2015–2022.	93
Final sample total		93
Observation year		8
Total observations		744

The type of approach in this study is a quantitative approach. The type of data taken in the quantitative approach is the type of data that can be obtained directly either in the form of data or descriptions which can be expressed in a number or number. This study uses panel data types where the data used uses a combination of time series and cross-section. The data used for this research is secondary data which retrieves data from the financial reports of manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the 2015–2022 period, through intermediary information media that contains processed data on ROE, KI and CO2 variables. Data is obtained through the Indonesia Stock Exchange (IDX) website which can be accessed via www.idx.co.id. Apart from that, carbon emission variables are obtained from annual reports or sustainability reports via the Indonesia Stock Exchange (IDX) and company websites.

The independent variable in this study is the company's performance which is calculated in the ratio of return on equity (ROE) which calculates the company's equity ability to earn profits and shows how the industry is effective in using its assets and capital. (Márcio, 2018). By using the formula (Mayasari et al., 2018)

$$\textbf{ROE} = \frac{Net\,Profit\,After\,Tax}{Total\,Equity}$$

The second independent variable in this study is corporate governance. Corporate governance is used to maintain relationships between decision makers and parties who supervise decision makers (Hapsoro & Hartomo, 2016; Hidayat & Muliasari, 2020). Corporate governance can be calculated with independent commissioners, where independent commissioners are commissioners who have no relationship with company management and no business relationships which can be a tool to be able to do things independently for the benefit of the company (Putra, 2016; Hidayat & Muliasari, 2020). The independent commissioner's calculations are as follows (Prasatya et al., 2020).

$$\textbf{KI} = \frac{\text{Indepenent Commissioner}}{\text{Total Commissioner}}$$

The dependent variable in this study is the amount of carbon emissions (CO2) obtained through manufacturing companies' sustainability reports for 2015–2022. Apart from that, the data obtained from the company's sustainability report will be transformed into a logarithmic transformation which aims to change the original data into data that can meet the expected assumptions.

The variables to be tested in this study are divided into two independent variables, namely company performance and corporate governance, while the dependent variable is disclosure of carbon emissions. Secondary data from several variables were obtained from the financial reports of manufacturing industry

companies from 2015-2022, after which they were processed and analyzed using panel data regression via Eviews 12. The following research equation is as follows:

$$CO2_{it} = \alpha_{it} + \beta_1 ROE_{it} + \beta_2 KI_{it} + \varepsilon_{it} \quad (1)$$

Where:

$CO2_{it}$ = Index of disclosure of carbon emissions of a company i for year t
ROE_{it} = Return on equity of company i for year t
KI_{it} = Corporate governance of company i for year t
α = Constant
β = Regression coefficient
ε = Error

The analysis technique in this study uses the panel regression analysis method. Panel data method selection can be done by using 3 (three) tests, namely: (1) Chow test is a test to ascertain the Common Effect (CEM) and Fixed Effect (FEM) models to estimate panel data. The assessment of the results of the Chow Test is as follows: a) If the p-value is 0.05, it can be ascertained that the test technique used is Common Effect (CEM), b) If the p-value is <0.05, then the model used is Fixed Effect. (2) Hausman test. The Hausman test is one of the measuring tools used to determine the use of either Fixed Effect or Random Effect (REM) models. Through parameters such as: a) If the p-value is 0.05 then the model used is Random Effect, b) If the p-value < 0.05 the model used is Fixed Effect. (3) Test Lagrange Multiplier. The Lagrange Multiplier (LM) test is a test to reveal the test comparison method between the common effect and random effect methods. Through the following criteria: a) If the cross section score in Breusch-Pagan > sig 0.05, it can be said that the method is appropriate, namely the common effect, b) Meanwhile, if the score from the cross section in Breusch-Pagan < sig 0.05, it can be said that the method is accurate namely random effects (Fajaryani & Suryani, 2018).

RESULTS AND DISCUSSION

The descriptive statistical analysis shown is the basic statistics formed from the mean, standard deviation, minimum and maximum can be seen in Table 2.

Table 2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
CO2	262	3.00	2.64	(-4.94)	7.09
ROE	262	9.83	16.38	(-88.00)	86.00
KI	262	0.37	0.11	0.14	0.83

Source: Secondary data, analyzed.

Table 2 shows that the average of carbon emissions as measured by carbon emissions (CO2) is 3.00. The minimum results for the carbon emission variable (CO2) are at the Darya Varia Laboratoria Tbk. (DVLA) in 2022 is (–4.94). Meanwhile, the maximum value lies with the company Japfa Comfeed Indonesia Tbk. (JPFA) which is 7.09 in 2022. A large level of carbon emissions (CO2) can show that the company must have improvements in monitoring the company's carbon emissions so that the level of carbon emissions can decrease and maintain the sustainability of the surrounding environment and the continuity of the company.

The average result in company performance as measured by the ROE ratio is 9.83. The minimum result of the ROE variable is at the company Prasidha Aneka Niaga Tbk. (PSDN) in 2021 is (–88.00). Meanwhile, the maximum value of the ROE variable is 86.00 by the company Multi Bintang Indonesia Tbk. (MLBI) in 2022. An increasing ROE variable can show that the profits achieved by the company from funding sources owned by each investor and shareholder can be managed well.

The average value of corporate governance studied using independent commissioners (KI) is 0.37. The minimum value of the KI variable is 0.14 for the Indah Kiat Pulp & Paper Tbk (INKP) company in 2021. Meanwhile, the maximum value of 0.83 is for Suparma Tbk (SPMA) company in 2019 and 2020. A high KI value can show that the company has implemented and implemented good corporate governance through continuous improvement by carrying out evaluations and conducting benchmarking.

The Chow test is used to be able to determine between the common effect method and the fixed effect when using the Chow test, by observing the probability F. By looking at the results in Table 3 show a Prob < F value of 0.0000 less than sig 0.05, it can be concluded that the Chow method is the best while the fixed effect.

Table 3 Chow Test Results

Common Effect (within) regression
Prob < F = 0.0000

Source: Secondary data analyzed.

The Hausman test is used to see which method is more suitable to use between the fixed effect and the random effect. Based on Table 4 the probability value > chi-squared is equal to 0.8879 from sig 0.05 which can be concluded that the better method is the random effect.

Table 4 Hausman Test Results

Hausman FE, RE
Prob < Chi-squared = 0.8879

Source: Secondary data analyzed.

The Lagrange Multiplier test is used to find out which tests are more precise between the common effect and random effect models. The results of the Lagrange Multiplier test shown in Table 5 state that the Breusch-Pagan value is < chi-squared = 0.0000 so the method used is the random effect method.

Table 5 Lagrange Multiplier Test Results

Lagrange Multiplier, cross section
Breusch-Pagan < chi-squared = 0.0000

Source: Secondary data analyzed.

Based on the test results, random effect was chosen as the best method in estimating the effect of variables on company performance, corporate governance and disclosure of carbon emissions in manufacturing companies. Then after having the right method to do the classical assumption test.

The normality test is used to see whether the residual values are normally distributed or not. Therefore, based on Table 6 it can be studied that the probability value is 0.0000 < sig. 0.05 so it can be concluded that the data is not normally distributed.

Table 6 Normality Test Results

Prob
Prob > Asym Sig[2] Tailed = 0.0000

Source: Secondary data analyzed.

The multicollinearity test has the goal of knowing whether the data used has multicollinearity constraints or not. Based on the results of Table 7, the correlation values X and X_2 are 0.019530 <0.85, so there is no multicollinearity.

Table 7 Multicollinearity Test Results

	X_1	X_2
X_1	1.000000	0.019530
X_2	0.019530	1.000000

Source: Secondary data analyzed.

The autocorrelation test is used to be able to test whether the data used has autocorrelation problems. The autocorrelation test in this study was studied using the Durbin Watson test. The Durbin-Watson test result based on Table 8 is 2.166. It can be interpreted that in this study there is no autocorrelation problem because the Durbin Watson value is greater than -2 and less than 2.

Table 8 Autocorrelation Test Results

Durbin-Watson	2.166

Source: Secondary data analyzed.

The heteroscedasticity test has benefits in testing, namely whether in a study there are differences in the variance of some residuals. The results of the heteroscedasticity test using the Glejser method in Table 9 show the values of the variables X_1 and X_2 having a probability of 0.2331 > sig. 0.05 and 0.3021 > sig 0.05 so there is no problem with the heteroscedasticity test.

Table 9 Results of the Glejser Heteroscedasticity Test

Variable	Prob.
X_1	0.2331
X_2	0.3021

Source: Secondary data, analyzed.

Based on the results of the three correlation tests which show that there is no effect between the multicollinearity test, the autocorrelation test and the heteroscedasticity test, the next thing is to examine the regression data with a random effect model. The results of data processing the regression with the random effect are presented in Table 10.

Table 10 Regression Results with Random Effects

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.3083	0.5346	8.0586	0.0000
X_1	0.0157	0.0062	2.5157	0.0125
X_2	-3.6191	1.1828	-3.0597	0.0024

Source: Secondary data, analyzed.

Based on the regression results with the random effect model, the research formula model that can be studied is as follows (Fitrianto & Musakkal, 2016):

$$\gamma_{it} = \alpha + x_{it}\,\beta + (\nu_i + \nu_{it}) \qquad (2)$$

Where:

γ_{it} = Dependent variable value
x_{it} = Independent variable
β = Unit coefficients
ν_{it} = Variant random disturbance, σ^2
ν_i = Individual-specific effects unobserved

Based on the panel data regression results in Table 10, H1 is proven which states that company performance has a positive effect on carbon emissions, with a significance level of 95% (alpha = 5%), with a significance value of the company performance variable of 0.0125 and a coefficient level of 0.0157. So, it can be concluded that company performance has a significant positive effect on carbon emissions.

H2 reveals that corporate governance has a negative effect on carbon emissions, with a significance level of 95% (alpha = 5%), with a significance value for the corporate governance variable of 0.0024 and a coefficient value of –3.6191. So, it can be seen that corporate governance has a significant negative effect on carbon emissions.

Company performance in this study uses one profitability ratio, namely Return on Equity (ROE). The probability result is 0.0157 and the variable significance level is 0.05 (alpha = 5%) which can show that the company performance variable has a significant positive effect on the carbon emissions of manufacturing companies listed on the Indonesia Stock Exchange (BEI).

The results of this research are in line with those carried out by Bae Choi et al. (2013); Wang et al. (2014); Jannah & Muid (2014); Cahya (2016); Apriliana (2019) which states that the company's performance ratio has a positive effect on increasing carbon emissions. This indicates that company performance calculated using one of the profitability ratios is directly proportional to carbon emissions. When Return on Equity (ROE) increases, the company's carbon emissions will increase and vice versa.

The greater the level of profitability that a company has, the more likely the company is to care and pay attention to environmental aspects by disclosing good news in the form of mandatory disclosures and voluntary disclosures such as carbon emissions disclosures which cause investors to be interested in placing their funds in

company. On the other hand, companies that have a low profitability value focus on how the company increases profits and manages company assets effectively and efficiently compared to paying attention to social aspects such as carbon emissions because this will increase the company's operational costs.

Apart from that, these results can clarify the legitimacy theory and stakeholder theory, where the legitimacy theory states that companies that have good financial performance will receive pressure from investors to provide information about environmental issues. Then, stakeholder theory states that companies will not always prioritize company profits but can provide benefits to the environment and social society.

Corporate governance is measured by Independent Commissioners (KI), where corporate governance is one of the activities carried out by the company to encourage the company to be more open in providing information to the public (Herawaty et al., 2021) and will increase the level of efficiency in using company assets for investment if the company implements good governance manage the company well (Firmansyah & Triastie, 2020). The results of the hypothesis study show that corporate governance has a probability coefficient of 0.0024 and a coefficient value of –3.6191, which means that the probability level is greater than the significance level of 0.05, so the corporate governance variable measured by commissioners independent (KI) has a significant negative effect on carbon emissions.

This shows that better corporate governance or increasing the proportion of independent commissioners will reduce and minimize the company's carbon emissions, because most independent commissioners owned by companies come from professional circles who have interests not only in the company but also pay attention to the interests of investors or society in general. Apart from that, these results can show that independent commissioners tend to encourage companies to care more about the environment. The study also suggests that corporate governance will reduce the company's carbon emission levels. Hence, it is very important to enhance the company's corporate governance practices beyond the mandatory matters. Furthermore, these results can also support legitimacy and stakeholder theory, where legitimacy and stakeholder theory both emphasize that companies must pay attention to and display responsibility for environmental issues that occur. This study also supports the IST in term of high ethical relationship of the firms with their stakeholders are characterized by high levels of information sharing, cooperation, and trust (Jones et al., 2018).

CONCLUSION

This research aims to find out whether company performance and corporate governance can influence the carbon emissions of manufacturing sector companies that have been listed on the Indonesia Stock Exchange (IDX) from 2015 to 2022 in a sustainable manner, with a sample size of 93 companies that meet the criteria. From the results that have been studied, it can be concluded that good company performance has a positive effect on carbon emissions. This can show that the better the company's performance, the higher the company's carbon emissions. Corporate governance has a negative effect on a company's carbon emissions. It can be concluded that corporate governance will reduce the company's carbon emission levels. A limitation in this research is that one of the test tools used is the normality test, where the test aims to see whether the data used is normally distributed or not. In this research, the data used is data that is not normally distributed, which indicates that the data used has subjectivity constraints in data collection and interpretation of the value of carbon emissions. This can arise because in determining the value of carbon emissions, each researcher has a different point of view in assessing carbon emissions and in this research, not all manufacturing companies in 2015-2022 registered on the IDX have carbon emission values in their sustainability report. Future research can add several other

measurement variables such as company size and media exposure. Further research can consider that the profitability variable can be used as a moderate variable for carbon emissions. Apart from that, further research can use other sector companies and use a longer time in order to get more comprehensive results.

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REFERENCES

Appiah, K., Du, J., Yeboah, M., & Appiah, R. (2019). Causal Correlation between Energy Use and Carbon Emissions in Selected Emerging Economies— Panel Model Approach. *Environmental Science and Pollution Research*, *26*(8), 7896–7912. https://doi.org/10.1007/s11356-019-04140-2

Apriliana, E. (2019). The Influence of Industry Type, Environmental Performance, and Profitability on Carbon Emission Disclosure Erika. *Widyakala Journal*, *6*(1), 84–95. https://doi.org/10.36262/widyakala.v6i1.149

Araújo, R. C. d. C., & Machado, M. A. V. (2018). Book-to-Market Ratio, Return on Equity and Brazilian Stock Returns. *RAUSP Management Journal*, *53*(3), 324–344. https://doi.org/10.1108/RAUSP-04-2018-001

Bae Choi, B., Lee, D., & Psaros, J. (2013). An Analysis of Australian Company Carbon Emission Disclosures. *Pacific Accounting Review*, *25*(1), 58–79. https://doi.org/10.1108/01140581311318968

Butler, C. D. (2018). Climate Change, Health and Existential Risks to Civilization: A Comprehensive Review (1989–2013). *International Journal of Environmental Research and Public Health*, *15*(10), 1–21. https://doi.org/10.3390/ijerph15102266

Cahya, B. T. (2016). Carbon Emission Disclosure: Judging from Media Exposure, Environmental Performance and Characteristics of Sharia-Based Go Public Companies in Indonesia. *Nizham*, *5*(2), 171–188. Available at: https://e-journal.metrouniv.ac.id/nizham/article/view/916/748

Daromes, F. E., Ng, S., & Legaspi, K. P. (2023). Joint Impact of Financial Performance And Corporate Social Responsibility On Firm Value: Does Legitimacy Matter? *Indonesian Journal of Sustainability Accounting and Management*, *7*(1), 1–14. https://doi.org/10.28992/ijsam.v7i1.651

Ebi, K. L. (2020). Mechanisms, Policies, and Tools to Promote Health Equity and Effective Governance of The Health Risks of Climate Change. *Journal of Public Health Policy*, *41*(1), 11–13. https://doi.org/10.1057/s41271-019-00212-2

Fajaryani, N. L. G. S., & Suryani, E. (2018). Capital Structure, Liquidity, and Company Size on Company Financial Performance. *Journal of Contemporary Accounting Research*, *10*(2), 74–79. https://doi.org/10.23969/jrak.v10i2.1370

Firmansyah, A., & Triastie, G. A. (2020). The Role of Corporate Governance in Emerging Market: Tax Avoidance, Corporate Social Responsibility Disclosures, Risk Disclosures, and Investment Efficiency. *Journal of Governance and Regulation*, *9*(3), 8–26. https://doi.org/10.22495/jgrv9i3art1

Fitrianto, A., & Musakkal, N. F. K. (2016). Panel Data Analysis for Sabah Construction Industries: Choosing the Best Model. *Procedia Economics and Finance*, *35*(3), 241–248. https://doi.org/10.1016/s2212-5671(16)00030-7

Florencia, V., & Handoko, J. (2021). Test the Effect of Profitability, Leverage, Media Exposure on Disclosure of Carbon Emissions with Moderation. *Journal of Accounting and Finance Research*, *9*(3), 583–598. https://doi.org/10.17509/jrak.v9i3.32412

Freedman, M., & Jaggi, B. (2011). Global Warming Disclosures: Impact of Kyoto Protocol Across Countries. *Journal of International Financial Management and Accounting*, *22*(1), 46–90. https://doi.org/10.1111/j.1467-646X.2010.01045.x

Frias-Aceituno, J. V., Rodriguez-Ariza, L., & Garcia-Sanchez, I. M. (2013). The Role of The Board in The Dissemination of Integrated Corporate Social Reporting. *Corporate Social Responsibility and Environmental Management*, *20*(4), 219–233. https://doi.org/10.1002/csr.1294

Gabrielle, G., & Toly, A. A. (2019). The Effect of Greenhouse Gas Emissions Disclosure and Environmental Performance on Firm Value: Indonesia Evidence. *Journal Scientific of Accounting and Business*, *14*(1), 106–119. http://dx.doi.org/10.24843/JIAB.2019.v14.i01.p10

Gobel, I. W. J., Tondobala, L., & Sela, R. L. E. (2019). Spatial Distribution of Carbon Dioxide (CO_2) Gas Emissions in Residential Areas in Singkir District, Manado City. *JOURNAL Spasial*, *6*(3), 628–636. https://doi.org/10.35793/sp.v6i3.25787

Gonzalez, J. M. G., & Ramírez, C. Z. (2016). Voluntary Carbon Disclosure by Spanish Companies: an Empirical Analysis. *International Journal of Climate Change Strategies and Management*, *8*(1), 57–79. https://doi.org/10.1108/IJCCSM-09-2014-0114

Hapsoro, D., & Hartomo, A. B. (2016). The Existence of Corporate Governance as a Moderating Variable on the Effect of Financial Distress on Earnings Management. *Journal of Economics and Business*, *19*(1), 91–116. https://doi.org/10.24914/jeb.v19i1.507

Herawaty, V., Lambintara, N., & Daeli, F. (2021). The Role of Profitability on the Influence of Board Governance on Sustainability Report Quality. *Accounting, Auditing & Information Research Media*, *21*(1), 115–136. https://doi.org/10.25105/mraai.v21i1.9209

Hidayat, A., & Muliasari, R. (2020). The Influence of Liquidity, Leverage and Independent Commissioners on Company Tax Aggressiveness. *SULTANIST: Journal of Management and Finance*, *8*(1), 28–36. https://doi.org/10.37403/sultanist.v8i1.183

Hilmi, H., Puspitawati, L., & Utari, R. (2020). The Influence of Competition, Profit Growth and Environmental Performance on Disclosure of Carbon Emission Information in Companies. *Owner (Research and Accounting Journal)*, *4*(2), 296–307. https://doi.org/10.33395/owner.v4i2.232

IPCC-Intergovernmental Panel on Climate Change. (2009). Climate Change 2007. In *International Encyclopedia of Human Geography*. https://doi.org/10.1016/B978-008044910-4.00250-9

Jannah, R., & Muid, D. (2014). Analysis of Factors that Influence Carbon Emission Disclosure in Companies in Indonesia (Empirical Study of Companies Listed on the Indonesian Stock Exchange for the 2010-2012 Period). *Diponegoro Journal of Accounting*, *3*(2), 1–11. Available at: https://ejournal3.undip.ac.id/index.php/accounting/article/view/6164

Javed, A., Aksar, M., Haq, A., Naeem, M., & Sufyani, M. A. (2023). Do Corporate Social Responsibility and International Financial Reporting Standards Implementation Matter? *Indonesian Journal of Sustainability Accounting and Management*, *7*(1), 1–14. https://doi.org/10.28992/ijsam.v7i1.841

Jones, T. M., Harrison, J. S., & Felps, W. (2018). How Applying Instrumental Stakeholder Theory Can Provide Sustainable Competitive Advantage. *Academy of Management Review*, *43*(3), 371–391. https://doi.org/10.5465/amr.2016.0111

Karunia, M. R., Komarulzaman, A., & Tjahjawandita, A. (2023). Energy Consumption, Financial Sector Development and Carbon Emissions in Indonesia. *Indonesian Journal of Economics and Development*, *23*(1), 81–92. https://doi.org/10.21002/jepi.2023.06

Kılıç, M., & Kuzey, C. (2019). The Effect of Corporate Governance on Carbon Emission Disclosures: Evidence from Turkey. *International Journal of Climate Change Strategies and Management*, *11*(1), 35–53. https://doi.org/10.1108/IJCCSM-07-2017-0144

Laplume, A. O. (2021). From Instrumental Stakeholder Theory To Stakeholder Capitalism. In *Oxford Research Encyclopedia of Business and Management*. Oxford University Press. https://doi.org/10.1093/acrefore/9780190224851.013.319

Mayasari, T., Yusuf, Y., & Yulianto, A. (2018). The Influence of Return on Equity, Net Profit Margin, and Company Size on Underpricing. *Journal of Accounting Studies*, *2*(1), 41–53. https://doi.org/10.33603/jka.v2i1.1271

Miah, M. D., Hasan, R., & Usman, M. (2021). Carbon Emissions and Firm Performance: Evidence from Financial and Non-Financial Firms from Selected Emerging Economies. *Sustainability*, *13*(23), 1–19. https://doi.org/10.3390/su132313281

Nasih, M., Harymawan, I., Paramitasari, Y. I., & Handayani, A. (2019). Carbon Emissions, Firm size, and Corporate Governance Structure: Evidence from The Mining and Agricultural Industries in Indonesia. *Sustainability (MDPI)*, *11*(9), 1–14. https://doi.org/10.3390/su11092483

Noor, M. A., & Saputra, P. M. A. (2020). Carbon Emissions and Gross Domestic Product: Investigation of the Environmental Kuznets Curve (EKC) Hypothesis in Middle Income Countries in the ASEAN Region. *Journal of Regions and Environment*, *8*(3), 230–246. https://doi.org/10.14710/jwl.8.3.230-246

Odoemelam, N., & Okafor, R. (2018). The Influence of Corporate Governance on Environmental Disclosure of Listed Non-Financial Firms in Nigeria. *Indonesian Journal of Sustainability Accounting and Management*, *2*(1), 25–49. https://doi.org/10.28992/ijsam.v2i1.47

Park, J., Lee, H., & Kim, C. (2014). Corporate social responsibilities, consumer trust and corporate reputation: South Korean consumers' perspectives. *Journal of Business Research*, *67*(3), 295–302. https://doi.org/10.1016/j.jbusres.2013.05.016

Peters, G. F., & Romi, A. M. (2014). Does the Voluntary Adoption of Corporate Governance Mechanisms Improve Environmental Risk Disclosures? Evidence from Greenhouse Gas Emission Accounting. *Journal of Business Ethics*, *125*(4), 637–666. https://doi.org/10.1007/s10551-013-1886-9

Prasatya, R. E., Mulyadi, J., & Suyanto, S. (2020). Executive Character, Profitability, Leverage, and Independent Commissioners Against Tax Avoidance with Institutional Ownership as a Moderating Variable. *Journal of Accounting & Taxation Research (JRAP)*, *7*(02), 153–162. https://doi.org/10.35838/jrap.v7i02.1535

Putra, B. P. D. (2016). The Influence of the Board of Commissioners, the Proportion of Independent Commissioners, on Company Performance. *Journal of Theoretical and Applied Management*, *8*(2), 70–85. https://doi.org/10.20473/jmtt.v8i2.2724

Rukmiyati, N. M. S., Purbawangsa, I. B. A., Baskara, I. G. K., & Candraningrat, I. R. (2023). Sustainable Disclosure Toward Firm Value: Recent Development and Future Research Agenda. *Indonesian Journal of Sustainability Accounting and Management*, *7*(1), 1–14. https://doi.org/10.28992/ijsam.v7i1.751

Sadorsky, P. (2014). The Effect of Urbanization on CO2 Emissions in Emerging Economies. *Energy Economics*, *41*, 147–153. https://doi.org/10.1016/j.eneco.2013.11.007

Shen, N., Zhao, Y., & Deng, R. (2020). A Review of Carbon Trading Based on an Evolutionary Perspective. *International Journal of Climate Change Strategies and Management*, *12*(5), 739–756. https://doi.org/10.1108/IJCCSM-11-2019-0066

Suwandi, S. I. N., Raras Tyasnurita, & Hanifan Muhayat. (2022). Forecasting Carbon Emissions Using SARIMA and LSTM Methods. *Journal of Computer Science and Informatics Engineering (J-Cosine)*, *6*(1), 73–80. https://doi.org/10.29303/jcosine.v6i1.436

Tong, S., & Ebi, K. (2019). Preventing and Mitigating Health Risks of Climate Change. *Environmental Research*, *174*, 9–13. https://doi.org/10.1016/j.envres.2019.04.012

Trireksani, T., & Djajadikerta, H. G. (2016). Corporate Governance and Environmental Disclosure in The Indonesian Mining Industry. *Australasian Accounting, Business and Finance Journal*, *10*(1), 19–28. https://doi.org/10.14453/aabfj.v10i1.3

Trufvisa, U. S., & Ardiyanto, M. D. (2019). The Influence of Board of Commissioners Characteristics on Carbon Emission Disclosure. *Diponegoro Journal of Accounting*, *8*(3), 1–11. Available at: https://ejournal3.undip.ac.id/index.php/accounting/article/view/25657

Urmila, N. M. D., & Mertha, I. M. (2017). Company Type Moderates Company Size, Profitability, Foreign Ownership on Manufacturing Companies' Corporate Social Responsibility Disclosure on the IDX. *Accounting E-Journal*, *19*(3), 2145–2174. Available at: https://jurnal.harianregional.com/akuntansi/id-29216

Verma, M., & Mukhtaruddin, M. (2023). Environmental Responsibilities and Firms Financial Performance: A Systematic Review And Bibliometric Analysis. *Indonesian Journal of Sustainability Accounting and Management*, *7*(1), 1–14. https://doi.org/10.28992/ijsam.v7i1.770

Wang, L., Li, S., & Gao, S. (2014). Do Greenhouse Gas Emissions Affect Financial Performance? - an Empirical Examination of Australian Public Firms. *Business Strategy and the Environment*, *23*(8), 505–519. https://doi.org/10.1002/bse.1790

Watts, N., Amann, M., Ayeb-Karlsson, S., Belesova, K., Bouley, T., Boykoff, M., Byass, P., Cai, W., Campbell-Lendrum, D., Chambers, J., Cox, P. M., Daly, M., Dasandi, N., Davies, M., Depledge, M., Depoux, A., Dominguez-Salas, P., Drummond, P., Ekins, P., … Costello, A. (2018). The Lancet Countdown on Health and Climate Change: from 25 years of Inaction to a Global Transformation for Public Health. *The Lancet*, *391*(10120), 581–630. https://doi.org/10.1016/S0140-6736(17)32464-9