JURNAL UPI

Jurnal Riset Akuntansi dan Keuangan

Journal homepage: https://ejournal.upi.edu/index.php/JRAK/

Voluntary Carbon Disclosure on Financial Performance and Investment Efficiency: A Study in Indonesia

Afif Musthafa[1], Taufiq Arifin[2]*

[1]Faculty of Economic, Universitas Tidar, Indonesia

[12]Faculty of Economics and Business, Universitas Sebelas Maret, Indonesia

*Correspondence: E-mail: afifm@untidar.ac.id

ABSTRACT

This study aims to seek empirical evidence on the effect of voluntary carbon disclosure on financial performance and investment efficiency of companies in Indonesia before the HPP Law. This study uses panel data analysis with a sample of 644 companies listed on the Indonesia Stock Exchange. The 2019-2020 sample was used because in 2021 there is already a law governing carbon tax. The results showed that the company's voluntary carbon disclosure has no influence on financial performance, both in the short and long term but has a positive influence on the company's investment efficiency. This research highlights the importance of voluntary carbon disclosure in building trust and support from stakeholders, which can provide benefits to the company in the form of investment efficiency and better financial performance. This research presents a more complex measure of voluntary carbon disclosure linked to financial performance and investment efficiency.

INFO ARTIKEL

Article History:

Submitted/Received June 15, 2024

First Revised July 15, 2024

Accepted July 31, 2024

First Available online August 14, 2024

Publication Date August 14, 2024

Keyword:

Voluntary Carbon Disclosure, Investment Efficiency,Financial Performance, Carbon Policy

1. INTRODCUTION

Climate change has become one of the global issues that has captured public attention (Mazzucato, 2018), resulting in many countries initiating corporate carbon disclosure policies (Hahn et al., 2015; Jiang et al., 2021). Companies are under increasing pressure to reduce their carbon emissions (Comyns, 2016; Daddi et al., 2018; Helfaya et al., 2019; Liesen et al., 2015). This suggests that the main concern regarding global warming issues lies in carbon emissions resulting from companies' operational activities. Companies also play a vital role in climate change, both as a cause and as a solution (Luo et al., 2012). Research from Siddique et al. (2021) found that carbon disclosure can help stakeholders, such as shareholders and creditors, to make better investment decisions. Siddique et al. (2021) also stated that carbon disclosure can help other stakeholders, such as law enforcement, institutional investors, and the public in general to monitor and regulate the carbon emissions produced by companies. This makes climate change and carbon disclosure a concern for all parties, thus making companies care about environmental issues.

Legitimacy theory reveals that companies must be able to adjust to the social system and values of society (Peprah et al., 2023). There are several expressions that companies will try to convince stakeholders if they have carried out and carried out their activities in accordance with applicable social norms and values. Legitimacy is a process used to gain trust and recognition from society for the survival of a company (Peprah et al., 2023). Company legitimacy is in a threatened position when there are differences in values between the company and society. The value is used by the company to secure the company from unexpected things, especially those related to differences in value views. One way to reduce the difference in value views is by disclosing carbon emissions (Peprah et al., 2023).

Carbon disclosure in practice is not immediately complied with by all entities, especially in developing countries. This is due to the priority of developing countries to improve development and economic performance and expand their commercial activities so that environmental sustainability in many cases is not prioritised (Islam & Deegan, 2008). As a result, there are serious environmental problems in some developing countries (Luo et al., 2013). Evidence from the literature suggests that potential factors that may increase voluntary carbon information disclosure in the corporate sector can be summarised into: social factors, financial market factors, economic pressures, and institutional/corporate ownership pressures (Kalu et al., 2016). Carbon disclosure is not only beneficial to the company in terms of sustainability, but also has costs. Companies are faced with the condition that disclosure has future economic benefits or not, especially with the existence of voluntary carbon disclosure can make the company a tax object (carbon tax). Findings conducted by Márquez et al. (2022) with a sample of 12 countries show that the number of regulations related to climate change negatively affects the tendency of companies to engage in greenwashing. Companies do seek legitimacy, but without sacrificing their economic efficiency due to the implementation of environmental practices that may prove costly. The disclosure of environmental information does not reflect any real commitment on the part of the company to combat climate change, thus implying a reduction in its environmental impact, as the company does not make any changes to its activities or only modifies them symbolically and not in practice (Gonzalez & Ramírez, 2016)

The influence between environmental information disclosure and investment efficiency has been confirmed from three perspectives, including: (1) Information asymmetry. Many researchers believe that information disclosure increases the transparency of corporate information and weakens the role of information returns, regardless of active or passive

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

disclosure (Hamid & Loke, 2021; Hornuf et al., 2022). Therefore, they consider that information disclosure positively improves investment efficiency; (2) Capital cost, some studies show that the reduction of investment costs, especially financing costs, reflects how information disclosure impacts investment efficiency (Habib & Hasan, 2021; Ji et al., 2020). According to Capital Cost Theory (Chondrakis et al., 2021), information disclosure effectively reduces over-investment and under-investment, encourages reasonable investment, and improves investment utilisation rate; and (3) Moral hazard, although companies listed on the stock exchange publish their information regularly at designated times, research shows that moral hazard plays an important role in influencing information disclosure (Kam & Lai, 2018; Xie et al., 2018), especially for mature top-tier companies.

Previous research generally discusses more in developed countries (Guenther et al., 2015; Jung et al., 2018; Matsumura et al., 2014; Siddique et al., 2021). As for research in developing countries such as Indonesia, there has not been much discussion of voluntary carbon disclosure proxied by financial performance, investment efficiency, and several other control variables to strengthen the research model. This study was conducted to fill that void with the background of companies in Indonesia in 2019-2020. The setting in 2019-2020 was done because during that period the Harmonisation of Tax Regulations Act (HPP Law) had not yet been passed, giving an assessment that carbon disclosure was done voluntarily.

This study aims to find empirical evidence of voluntary carbon disclosure policy on financial performance and investment efficiency of companies. The contribution of this study theoretically is expected to strengthen the literature on legitimacy theory and add references regarding voluntary carbon disclosure on financial performance and investment efficiency. It can also provide recommendations for stakeholders regarding carbon reporting information in decision making and also as a government study in formulating appropriate policies regarding carbon emissions.

2. LITERATURE REVIEW

Legitimacy Theory

The relationship between companies and carbon disclosure basically has many theoretical bases. (Hahn et al., 2015) identified that there are at least three major theories that can be used to analyse the relationship between companies and carbon disclosure. The first major theory is the sociopolitical theory. This theory states that companies disclose carbon due to socio-political pressure from various stakeholders. The second major theory is the economics-based theory. This theory states that companies in conducting carbon disclosure pay attention to the costs and benefits of the decisions to be taken. The third major theory is institutional theory. This theory states that companies' carbon disclosure is influenced by the context of the surrounding institutional environment (Hahn et al., 2015).

Sociopolitical theory as a grand theory has two approaches that can be used. The first approach is through the use of stakeholder theory. Stakeholders in the definition from Siddique et al. (2021) are any individual or group that can affect or be affected by the achievement of organisational goals. For companies, there are many stakeholders who put pressure on companies to disclose carbon. These stakeholders include the government, investors, employees, customers, and society. These stakeholders put pressure on the company either directly or indirectly. However, the degree of pressure between stakeholders varies substantially. For company managers, one of the important tasks they need to carry out is to balance the various pressures coming from various stakeholders. The second approach is through the use of legitimacy theory. According to Suchman (1995), legitimacy is defined as a

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

general perception or assumption related to an action that is considered desirable, appropriate, and appropriate in a social construction system in which there are norms, values, beliefs, and understandings. Therefore, legitimacy theory states that companies disclose carbon in order to maintain the legitimacy of the company.

Legitimacy theory states that the sustainability of a company is very dependent on the extent to which the company carries out its business activities in accordance with the values held by society. Companies need to gain social legitimacy to survive in the long term. This causes companies to face greater pressure from various stakeholders, including society, regulators and investors. Companies are required to make objective and high quality. This disclosure not only helps companies meet society's expectations but also increases their transparency and accountability. Research by Siddique et al. (2021); Velte et al. (2020) emphasize that quality voluntary disclosure can strengthen companies' legitimacy, thereby helping them manage external pressures and maintain operational sustainability.

Legitimacy theory reveals that companies must be able to adjust to the social system and values of society (Peprah et al., 2023). There are several expressions that companies will try to convince stakeholders if they have carried out and carried out their activities in accordance with applicable social norms and values. Legitimacy is a process used to gain trust and recognition from society for the survival of a company (Peprah et al., 2023). Company legitimacy is in a threatened position when there are differences in values between the company and society. The value is used by the company to secure the company from unexpected things, especially those related to differences in value views. One way to reduce the difference in value views is by disclosing carbon emissions (Peprah et al., 2023).

Financial Performance

Financial performance measurement can be measured using the return on assets (ROA) and Tobin's Q ratios (Siddique et al., 2021). According to Siddique et al. (2021) argue that financial performance measures are carried out in the short and long term, it is considered complementary to evaluate the relationship between carbon disclosure and financial performance. Furthermore, Siddique et al. (2021) argued that in their financial performance measurement study they used return on assets (ROA) as a measure of short-term financial performance. The ROA measure considers current costs and relevant income disclosed in the financial statements, with immediate payments for the investment to be profitable. Financial performance measurement also uses Tobin's Q, a market-based measure that includes intangible assets and investors' long-term perception of the firm's sustainability (Delmas et al., 2015; Dowell et al., 2000; Siddique et al., 2021). Short-term performance measures take into account current cash flows in the current market environment, while long-term financial performance measures consider future profitability forecasts in light of possible legislation proposed to address climate change.

Effiency Investment

Investment efficiency is a balanced condition (midpoint) between the expectations of the company (investor) and the investment made. Investment can be considered efficient if the level of investment expected by the company does not experience any deviation. An investment can be considered overinvestment or underinvestment, this happens when the company is too excessive in making an investment or in other words exceeds above the predetermined target (overinvestment). Underinvestment can occur when the company does

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

not adequately fund a project, but the project has future economic benefits for the company (underinvestment).

Companies can experience overinvestment or underinvestment due to various factors. There is a demand for companies to be able to save existing resources and generate company profitability, managers are required to be able to manage resources so as to create a match between expectations and realisation. Overinvestment is characterised by investment expenditure that exceeds the company's expectations, this condition will result in the company experiencing a slow growth rate, assets in place and high free cash flow. Based on the research model in measuring investment efficiency, it shows that an increasing sales growth rate shows an increasing investment, and vice versa, a decreasing sales level will have an impact on decreasing the company's investment level. The higher investment efficiency will show the more efficient use of cash or company assets in making an investment, so it can be said that the more efficient investment is made, the higher the cash flow will be. Contrary to that, underinvestment is characterised by less investment expenditure compared to the number of expectations or opportunities that exist because the company does not have enough funds to finance an investment. Investment efficiency is related to the increase in sales or sales growth, if the sales of a company are increasing, it certainly illustrates that profits are increasing as well, so managers will think of maximising their profits in any way including investment. Vice versa, if the company's sales decrease, the level of investment will also decrease. High investment efficiency indicates efficient use of cash or assets in making investments. There are two factors for companies to experience overinvestment and underinvestment. The company experiences underinvestment in the condition that the company misses an investment with a positive Net Present Value (NPV) because it does not have the availability of funds, this happens because of the high cost of capital. The company also experiences overinvestment when the company manager invests in projects with a negative Net Present Value (NPV) value, so that the investment made incurs excessive costs. Furthermore, Sari & Suaryana (2014) define overinvestment as a condition experienced by the company when the investment made is higher than expected, while underinvestment is defined as a condition experienced by the company when the investment made is lower than expected.

Hypothesis Development

Based on legitimacy theory, companies will try to convince the public if they have conducted and carried out their activities in accordance with the social norms and values that exist in the community and contained in government regulations that have been applied in the community. The existence of carbon disclosure is the company's step in maintaining business continuity by complying with applicable regulations, values and norms so that the company can continue to operate. Company management is faced with two choices on carbon disclosure, the benefits and costs incurred. Legitimacy theory is the bridge theory for this variable. Carbon disclosure provides more information to stakeholders so that the company can continue to be sustainable. Stakeholders in this case include the community, customers, suppliers, shareholders, government, and institutions that make laws and regulations. Voluntary carbon disclosure gives more trust to stakeholders. The decision, however, is not immediately implemented by the company's management because there are costs involved. Various studies on the effect of carbon disclosure and financial performance concluded mixed results. Research conducted by Siddique et al. (2021) using legitimacy theory found a negative relationship between carbon disclosure and financial performance in the short term and a

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

positive relationship in the long term. The study of Dowell et al. (2000) found a positive relationship between the market value of a company as measured by Tobin's Q and the level of environmental standards it adopts. Specifically, they show that firms adopting strict global environmental standards have a higher market value than firms adopting less strict or localised environmental standards. Konar & Cohen (2001) study using Tobin's Q to measure the tangible and intangible value of a firm found that poor environmental performance has a negative effect on the intangible asset value of publicly traded firms. Based on the framework of legitimacy theory, companies that disclose carbon provide poor information to stakeholders and thus have a negative impact on financial performance, our hypothesis is as follows:

H_{1a} There is a negative impact of carbon disclosure on short-term financial performance

H_{2a} There is a negative impact of carbon disclosure on long-term financial performance

Another finding in a study conducted by Delmas et al. (2015) used longitudinal data for 1,095 US companies from 2004 to 2008 which was a period of increased activity for climate change legislation, to estimate the impact of greenhouse gas emissions on short-term and long-term financial performance measures. They found that during this period, an increase in corporate environmental performance led to a decrease in the short-term financial performance indicator, return on assets. These results are in line with Laan et al. (2008) who argued that there is a negative relationship between corporate social performance that is negative for key stakeholders (e.g. investors, consumers, employees) and short-term financial performance. The study conducted by Busch & Hoffmann (2011) also found a negative relationship between process-based corporate environmental performance (CEP) and financial performance, and argued that process-based CEP ignores the measurement of concrete resource consumption and emissions optimisation. Based on the framework of legitimacy theory, companies that disclose carbon provide good information to stakeholders and thus have a positive impact on financial performance, our hypothesis is as follows:

H_{2a} There is a negative impact of carbon disclosure on short-term financial performance

H_{2b} There is a negative impact of carbon disclosure on long-term financial performance

Research conducted by Guidry & Patten (2012) found that disclosing emissions data can invite additional monetary and implicit costs such as shareholder reactions so that disclosure is subject to cost-benefit analysis. Companies are reluctant to disclose carbon due to the lack of regulation and the needs of interested parties. Moreover, carbon disclosure incurs costs and lack of economic benefits. Another finding conducted by Chen et al. (2022) by examining investment efficiency shows that carbon emissions trading restrains overinvestment and promotes corporate investment efficiency. In line with that, Yan et al. (2022) also used investment efficiency in examining the effect of green finance reform pilot zones and innovation on corporate investment efficiency using a sample of Chinese companies listed on the A-share index from 2015-2020.

Based on the framework of legitimacy theory, companies with carbon disclosure will have more disclosure costs and take benefits that are not proportional to the costs incurred.

H_{3a} There is a negative relationship between carbon disclosure and investment efficiency.

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

Based on the framework of legitimacy theory, companies that disclose carbon have more benefits than costs. Therefore, companies with good carbon disclosure will disclose more carbon.

H_{3b} There is a positive relationship between carbon disclosure and investment efficiency.

3. RESEARCH METHODOLOGY

This research is inferential quantitative research. The population of this study is companies listed on the Indonesia Stock Exchange in 2019-2020. Further sampling was carried out using purposive sampling method. The characteristics of the sample in general are as follows:

a. Companies listed on the Indonesia Stock Exchange at the time of the ratification of the HPP Law.
b. Non-financial companies listed on the Indonesia Stock Exchange at the time of the ratification of the HPP Law.

Non-financial data is taken based on research conducted by Biddle et al. (2009); Liu, et al. (2022); Yan et al. (2022) yang which exclude the financial sector because it requires different data treatment.

Table 1. Research Sample

No.	Procedure	Number of Samples (companies)
1	Companies listed on the Indonesia Stock Exchange on 7 October 2021; 753;	753
2	Financial companies (financial sector and financial and investment sub-sectors);	(109)
Total company sample 1 period		644
	Number of samples used (644 x 2 years)	**1.288**

This study uses data on voluntary carbon disclosure by companies in 2019 and 2020. This is because the new COGS Law was officially inaugurated in 2021. This situation makes the data on carbon disclosure available and possible to use are data from 2019 and 2020. In general, the 2020 data was published in company reports published in mid-2021. This assumption is used in reference to the research of Ramírez & González (2015) who used the previous year's data because the publication of information was carried out the following year.

This study uses 3 models with the same independent variables. The research model based on Figure 1 is as follows:

Model 1 :

$$ROA_{i,t} = \boldsymbol{\alpha}_0 + \boldsymbol{\alpha}_1 CD_{i,t-1} + \boldsymbol{\alpha}_2 Size_{i,t} + \boldsymbol{\alpha}_3 Lev_{i,t} + \boldsymbol{\alpha}_4 CAPIN_{i,t} + \boldsymbol{\alpha}_5 Age_{i,t} + \boldsymbol{\alpha}_6 CINT_{i,t} + \boldsymbol{\alpha}_7 Earning\ Quality_{i,t} + \boldsymbol{\alpha}_8 Stock\ Liquidity_{i,t}$$

Model 2:

$$TOBINSQ_{i,t} = \boldsymbol{\alpha}_0 + \boldsymbol{\alpha}_1 CD_{i,t-1} + \boldsymbol{\alpha}_2 Size_{i,t} + \boldsymbol{\alpha}_3 Lev_{i,t} + \boldsymbol{\alpha}_4 CAPIN_{i,t} + \boldsymbol{\alpha}_5 Age_{i,t} + \boldsymbol{\alpha}_6 CINT_{i,t} + \boldsymbol{\alpha}_7 Earning\ Quality_{i,t} + \boldsymbol{\alpha}_8 Stock\ Liquidity_{i,t}$$

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

Model 3:

$$Investment_{i,t} = \boldsymbol{\alpha}_0 + \boldsymbol{\alpha}_1 CD_{i,t-1} + \boldsymbol{\alpha}_2 Size_{i,t} + \boldsymbol{\alpha}_3 Lev_{i,t} + \boldsymbol{\alpha}_4 CAPIN_{i,t} + \boldsymbol{\alpha}_5 Age_{i,t} + \boldsymbol{\alpha}_6 CINT_{i,t} + \boldsymbol{\alpha}_7 Earning\ Quality_{i,t} + \boldsymbol{\alpha}_8 Stock\ Liquidity_{i,t}$$

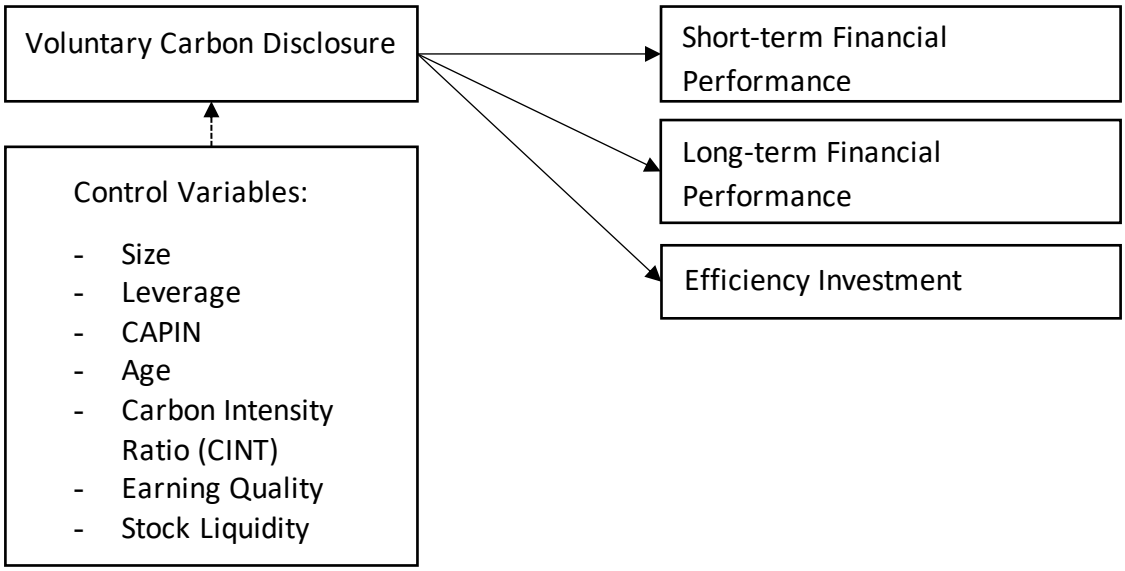

Figure 1. Conceptual Framework

The dependent variable in this study uses financial performance (ROA and Tobins'Q) and investment efficiency. Financial performance measurement can be measured using the return on assets (ROA) and Tobin's Q ratios (Siddique et al., 2021). According to Siddique et al. (2021), the measurement of financial performance is carried out in the short and long term, it is considered complementary to evaluate the relationship between carbon disclosure and financial performance. Siddique et al. (2021) also argue that in their study financial performance measurement uses return on assets (ROA) as a measure of short-term financial performance. The ROA measure considers current costs and relevant income disclosed in the financial statements, with immediate payments for the investment to be profitable. The financial performance measure also uses Tobin's Q, a market-based measure that includes intangible assets and investors' long-term perception of the firm's sustainability (Delmas et al., 2015; Dowell et al., 2000; Siddique et al., 2021). Short-term performance measures take into account current cash flows in the current market environment, while long-term financial performance measures consider future profitability forecasts given possible legislation proposed to address climate change.

The dependent variable also uses investment efficiency. Carbon disclosure provides two options to companies in the form of benefits and costs. Research conducted by Chen et al. (2022) shows that carbon emissions trading restrains overinvestment and encourages corporate investment efficiency. Measurement of investment efficiency in this study uses a model conducted by Biddle et al. (2009) by measuring the expected investment of company i in year t, measured using the investment level prediction model. Company opportunities in company growth (growth opportunisties) are measured using the level of sales. The calculation of the formula will produce a residual value which is then used as a proxy for investment efficiency. The residual value is then divided into several quartiles, the lower quartile range will be categorised as an underinvestment company while the upper quartile

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

will be categorised as an overinvestment company, and the middle quartile is used as a reference in determining underinvestment and overinvestment (Biddle et al., 2009).

The independent variable of this study is voluntary carbon disclosure (CD). Voluntary carbon disclosure is a company's activity in the form of reporting the amount of carbon generated from its business activities. Carbon disclosure by companies depends on the company's management policy, some are reported in the annual report and sustainability report. Legitimately, this reporting is done so that the company can continue to carry out its activities because it complies with applicable regulations. The measurement of carbon disclosure in this study waits for indicators from research conducted by Choi et al. (2013). There are five assessment categories in the disclosure of carbon emissions, namely as follows: climate change opportunities (CC/Climate Change), greenhouse gas emissions (GHG/Greenhouse Gas), energy consumption (EC/Energy Consumption), greenhouse gas reduction and cost (RC/Reduction and Cost) and accountability of carbon emissions (AEC/Accountability of Emission Carbon). The five categories are then translated into 18 indicator assessment categories. The assessment is done by giving a value of 1 if the company reports and a value of 0 if the company does not report following Fu et al. (2023).

Control variables are research variables used to control the independent variables so as to minimise research bias. This variable is deliberately made constant by the researcher as a way to minimise or eliminate other influences besides the independent variable that may affect the results of the dependent variable. The control variables in this study adopt research conducted by Siddique et al. (2021). The control variables carried out in this study are as follows: company size (size); debt ratio (leverage); capital intensity (CAPIN); company age (age); earning quality; stock liquidity; carbon intensity.

Company size (size) is used as a control variable based on the research of Clarkson et al., (2010); Luo (2019); Siddique et al. (2021). These studies found that larger companies have the physical and financial resources necessary to disclose non-financial information in a detailed and comprehensive manner. Large companies are also often subject to heightened public scrutiny. In this study, company size is measured using total assets. The use of company size as a control variable is done to control for factors that may affect the relationship between the independent variable and the dependent variable. This is important because large companies tend to have more resources to make better disclosures, which in turn can affect their environmental and financial performance.

Companies with low leverage are considered better able to carry out disclosures, including carbon emissions disclosures, because they have fewer financial obligations that must be fulfilled. Low levels of debt give companies greater power and flexibility in allocating resources for disclosing non-financial information that society considers important. Companies can be more responsive to social pressure and demands for transparency from external parties because they are not too burdened by obligations to creditors. In contrast, highly leveraged firms tend to focus on meeting their financial obligations, which reduces the resources and attention that can be allocated to voluntary disclosure. As a result, these companies may disclose less non-financial information, including information related to carbon emissions. Study by Siddique et al. (2021); Velte et al. (2020) confirm that high leverage often results in lower disclosure because the company's main priority is fulfilling creditor obligations rather than meeting transparency demands from the wider community.

Capital intensity (CAPIN) is a variable used to measure the amount of expenditure on assets needed to support the company's income level, indicating how much capital is needed to generate company income. Companies described as "capital intensive" require large capital

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

investments for growth, while "non-capital intensive" companies require less spending to create the same income. Companies with significant fixed asset purchases, which consistently require high capital expenditures (capex) as a percentage of revenue, are considered more capital intensive. The relationship between capital expenditure and carbon emission disclosure shows that companies with high capital expenditure face greater social pressure to disclose financing related to their environmental activities. This disclosure becomes necessary as a form of legitimacy in the eyes of society (Siddique et al., 2021; Velte et al., 2020). The study by Clarkson et al. (2008) state that companies with larger capital expenditures have the ability to adopt cleaner and newer technologies, which in turn helps them achieve higher levels of environmental performance. The calculation of capital intensity (CAPIN) in this study uses average total assets divided by total income. For example, to calculate the capital intensity ratio in 2020, total assets in 2019 and 2020 are added together and then divided by two, and the result is then divided by total income in 2020.

Company age is an important indicator in assessing a company's ability to survive and be sustainable in the long term. Companies that have been operating for a long time usually have built a strong reputation and have experience in facing various business challenges. As companies age, they tend to have more resources, both physical and financial, and higher operational activity. However, this increase in size and activity has also led to increased pressure from various stakeholders, including society, government, and investors. Companies must make objective and high-quality voluntary disclosures in order to be able to manage pressure and maintain legitimacy in the eyes of the public. These disclosures cover various aspects of the company's operations, including its financial performance and environmental and social impacts. Transparent and trustworthy disclosures impact companies can demonstrate their commitment to responsible and sustainable business practices. Research by Siddique et al. (2021); Velte et al. (2020) assert that good disclosure not only helps companies meet stakeholder demands but also increases their legitimacy in the eyes of the public, ultimately supporting the company's long-term sustainability.

Earnings quality have an important role in encouraging companies to disclose information voluntarily. Disclosures made by companies not only include financial information but also include non-financial information that is relevant to the company's performance and sustainability. (Francis et al., 2008) show that good earnings quality is correlated with a higher level of disclosure, where companies with good earnings quality are more likely to make voluntary and transparent disclosures. Earnings quality is used as a control variable, following a study conducted by (Francis et al., 2008; Siddique et al., 2021). Earnings quality is defined as the standard deviation of a company's earnings over a 10-year period, which reflects the stability and consistency of a company's financial performance.

Transparency in company operations is key to building trust with stakeholders, and one effective way to increase transparency is through increasing stock liquidity. Company management has a strong incentive to increase stock liquidity because this not only makes it easier to issue new shares, but also allows them to sell shares acquired through options or other compensation plans more easily. According to research conducted by Dhaliwal et al. (2011), low levels of stock liquidity can influence a company's tendency to make voluntary disclosures. Companies with low stock liquidity may be more reluctant to disclose information voluntarily because they worry that the information could negatively affect their stock prices. However, by increasing stock liquidity, companies can reduce these concerns and feel more comfortable making broader voluntary disclosures. Research by Dhaliwal et al. (2011); Siddique et al. (2021) define stock liquidity as the ratio of the number of shares traded in one

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

year to the total shares outstanding at the end of the year. This ratio provides an idea of how actively a company's shares are traded in the market, which in turn reflects the liquidity of the shares. Increased stock liquidity not only helps in reducing barriers to voluntary disclosure but also strengthens overall corporate transparency.

The study conducted by Clarkson et al. (2008) argues that carbon intensity is used as a control variable because companies with higher carbon intensity relative to other companies, tend to report more carbon-related information to avoid negative effects. The measurement of carbon intensity in this study uses data on the percentage of carbon disclosure per sector, by doing a dummy. We assign a value of 1 to business sectors that have a percentage of carbon reporting more than the overall company average, 43.95% in 2019 and 59.49% in 2020.

This study uses panel data regression analysis to analyse the research data. There are three types of data, namely data based on time series, cross-sectional data, and combined data (panel data). Data categorised as time series data is data consisting of one or more variables with different time series. Data categorised as cross section data is data consisting of one or more variables with the same time period. This study uses panel data because it is conducted with more than one variable in different time periods. The use of cross section data is done with a sample size of 644 companies. As for the use of time series data, it was carried out in 2020-2021.

4. RESULT AND DISCUSSION

Table 2. Result Statistic Test

Variables	Financial Perfomance				Efficiency Investment	
	Short-Term		Long-Term			
	β	*t*	*β*	*t*	*β*	*t*
Voluntary Carbon Disclosure	-0,21245	-1,72*	-0,00316	-0,20	0,01500	2,89***
Size	1,14915	4,68***	-0,11902	-1,53	-0,01883	-1,87*
Leverage	-0,07511	-2,91***	0,00289	1,40	-0,00189	-2,02**
Capital Intensity (CAPIN)	0,12387	0,52	0,01624	0,74	0,01740	1,43
Age	-0,00976	-0,27	1,65925	24,44***	0,00196	1,39
Carbon Intensity Ratio (CINT)	2,69335	3,10***	0,00000	-	0,08769	2,66***
Earning Quality (EQ)	-0,18721	-1,77*	0,08973	1,46	0,00083	0,19
Stock Liquidity (SL)	0,79648	7,51***	0,06087	4,09***	-0,00097	-0,16
Constant	-27,84216	-6,42	-22,09384	-12,42***	0,72606	4,17***

*Note: *** significant at p<0.01, ** significant at p<0.05, * significant at p<0.1.*

The statistical calculations above present the results of a study on the relationship between carbon disclosure financial performance and investment efficiency. The results show that carbon disclosure has a negative impact on the company's financial performance, indicating that the company does not have enough financial benefits to exceed the cost of carbon disclosure in the short and long term. The existence of carbon disclosure decreases short-term financial performance while in the long run, carbon disclosure is considered to be a disclosure or disclaimer so that managerial policy has no impact on long-term financial performance. The study was conducted when the COGS Law had not yet been passed, so there were no regulations governing carbon disclosure. The voluntary nature of carbon disclosure causes long-term management calculations to have less impact.

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

On short-term financial performance, the return on assets ratio is calculated based on the company's revenue compared to the amount of assets owned. This measure is done to calculate the company's ability to generate profits with all the assets owned by the company. Short-term performance measures take into account current cash flows in the current market environment, while long-term financial performance measures consider estimates of future profitability given the possibility of proposed legislation to address climate change. Profitability ratios relate profits to the number of sales and capital or assets used to generate profits. Based on the results of statistical calculations, it shows a negative direction, so companies that disclose carbon actually make the magnitude of this ratio decrease.

This result also shows that in the short term, carbon disclosure can reduce the company's financial performance. This is because the costs associated with carbon disclosure and efforts to meet higher environmental standards may outweigh the financial benefits gained from improved reputation and energy efficiency in the short term. The short-term decline in financial performance associated with carbon disclosure may also reflect the initial challenges companies face in adapting to more sustainable business practices.

Legitimacy theory states that companies seek to ensure that they operate within the boundaries and norms that are acceptable to the society in which they operate. Companies seek legitimacy from their stakeholders to maintain their social license to operate. Carbon disclosure can be seen as an attempt by companies to meet stakeholder expectations and strengthen their legitimacy. Although carbon disclosure may lead to a short-term decline in financial performance, companies may feel that this cost is necessary to maintain their legitimacy in the long run. Companies are expected to build trust and support from stakeholders, including investors, consumers and regulators by demonstrating a commitment to sustainability and environmental impact reduction. The long-term legitimacy gained from voluntary carbon disclosure can help companies overcome challenges and capitalize on opportunities associated with the shift towards a more sustainable economy. Companies that are perceived as socially and environmentally responsible may have better access to capital markets, be able to attract and retain customers, and reduce regulatory risk. Thus, despite short-term costs, carbon disclosure can be a strategic investment in a company's legitimacy and long-term sustainability.

This finding is corroborated by the findings of Delmas et al. (2015); Siddique et al. (2021) and supports this finding. In developed countries, they highlighted that despite increased awareness and demand for environmental transparency, there are still challenges in integrating social and environmental performance with financial performance. Laan et al. (2008) argued that a focus on poor social aspects can reduce the trust of key stakeholders (e.g. investors, consumers, suppliers), which negatively impacts short-term profits. This finding is in line with a study by Busch & Hoffmann (2011) who also found a negative relationship between process-based corporate environmental performance (CEP) and financial performance, and argued that process-based CEP ignores the measurement of concrete resource consumption and emissions optimization. A long-term perspective shows a different picture. Studies such as the one conducted by Siddique et al. (2021) suggest that carbon transparency and disclosure can have a positive impact on long-term financial performance, possibly due to improved reputation and public trust. Meanwhile, Konar & Cohen (2001) found that while good environmental performance may hurt the value of intangible assets in the short term, this may change as market perceptions of the importance of sustainability change. In developed countries, companies need to balance meeting stakeholder demands for social and environmental responsibility with maintaining sound financial performance.

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

This finding contradicts carbon disclosure on investment efficiency. This is because investment efficiency takes into account the middle (efficient) value expressed in residual value 0 while financial performance does not. The value of financial performance is measured by ratios so that the higher the ratio, the better and does not take into account the middle value (balance).

Investment efficiency in theory is a form of meeting between the investment made by the company and sales. The increase in company sales also coincides with the increase in investment made. An increase in sales requires an increase in investment. This variable calculates investment by the amount of fixed assets and intangible assets allocated by the company, then regressed on the increase in sales, resulting in a residual value. Residuals in simple linear regression are the difference between predicted and actual values. When sales increase, it requires investment. The residual value shows the difference between the predicted sales increase and the investment made. The more the residual value approaches 0, the closer the predicted value is to the actual value. This equation then makes the company classified as an efficient company.

Carbon disclosure theoretically increases stakeholder trust. Legitimacy theory explains how companies seek to gain support and trust from society by adjusting their activities in accordance with prevailing social norms and values. Increased sales often require increased investment in fixed and intangible assets. To achieve this efficiency, companies should ensure that the residual value in the linear regression between sales and investment is close to zero, indicating that the prediction of investment is almost equal to reality. Carbon disclosure is one way for companies to demonstrate compliance with existing social norms and regulations, thereby increasing the trust of various stakeholders such as society, customers, government, and shareholders. When companies transparently report their carbon impacts and mitigation efforts, they gain legitimacy in the eyes of the public. This increased trust drives increased sales, which in turn requires increased investment to meet higher demand.

Carbon disclosure also carries financial consequences and implicit costs such as shareholder reactions, which should be analyzed through a cost-benefit approach (Guidry & Patten, 2012). Although environmental sustainability is often not a top priority in managerial efforts, as highlighted by Islam & Deegan (2008), this study shows that the right legitimization strategy can significantly increase stakeholder trust. This increased trust, in turn, drives increased sales and the need for additional investments, which reinforces the firm's investment efficiency. Thus, efforts to gain legitimacy through carbon disclosure not only help companies meet social expectations but can also drive better financial performance through increased sales and investment efficiency. The increase in sales can actually be achieved through legitimization efforts in order to increase stakeholder trust so as to increase sales. Efforts to increase trust are then calculated in the investment made by the company.

This research reinforces the findings of various studies that show that corporate governance that cares about the environment can increase investment efficiency. Liu et al. (2022) found that during the COVID-19 pandemic, companies in China that implemented environmental governance schemes managed to achieve higher investment efficiency. In addition, research by Chen et al. (2022) showed that carbon emissions trading can restrain overinvestment and promote corporate investment efficiency. This finding is consistent with the study of Yan et al. (2022) who found that in the pilot zone of green finance reform, corporate innovation in reducing carbon emissions successfully reduced inefficient investment. In conclusion, carbon disclosure and green innovation are not only beneficial to the environment but also significantly improve the efficiency of corporate investment. That is,

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

carbon disclosure and corporate innovation in reducing carbon emissions shape investment efficiency.

Table 3. Statistic Result with Robust Standard Error

Variables	Financial Performance				Efficiency Investment	
	Short-Term		Long-Term			
	β	*t*	*β*	*t*	*β*	*t*
Carbon Disclosure	-0.24651	-1.66*	-0,00316	-0,30	0,01686	3,29***
Size	1.09180	4.07***	-0,11902	-0,69	-0,01545	-1,53
Leverage	-0.07625	-1.36	0,00289	1,43	-0,00178	-1,78*
Capital Intensity (CAPIN)	0.14554	0.58	0,01624	0,71	0,01256	1,01
Age	0.00689	0.19	1,65925	21,16***	0,00147	1,03
Carbon Intensity Ratio (CINT)	-0.16042	-1.67	0,00000	-	-0,00083	-0,18
Earning Quality (EQ)	0.78733	5.69*	0,08973	1,47	-0,00090	-0,15
Stock Liquidity (SL)	-0.24651	-1.66***	0,06087	3,89***	0,01686	3,29
Constant	-27.2410	-5.05***	-22,09384	-6,90***	0,72863	4,20***

*Note: *** significant at p<0.01, ** significant at p<0.05, * significant at p<0.1.*

The use of robust standard error is a robustness test technique that serves to overcome heteroscedasticity and violations of regression model assumptions, such as homoscedasticity and autocorrelation. The use of robust standard errors can produce more accurate parameter estimates, improve the reliability of statistical inference, and provide more realistic confidence intervals. This technique allows the research results to be less dependent on ideal model assumptions, thus better reflecting the actual data conditions, both in cross-sectional and panel data (Bekker & Wansbeek, 2016; Hayakawa & Pesaran, 2015).

Tests on control variables show mixed results, indicating that the effects of various control factors on the financial performance and investment efficiency of companies may vary. Firm size has a negative impact on long-term financial performance and investment efficiency. This finding implies that the larger the size of the firm, the less its long-term financial performance and investment efficiency. This could be due to various factors such as increased operational complexity, more bureaucracy, and potential inefficiencies in resource management in large firms. This finding also indicates that larger firms tend to have better short-term financial performance. Large firm size is usually associated with more resources, better access to capital markets, and the ability to take advantage of economies of scale. Large companies can generate higher profits from their assets, which is reflected in an increase in return on assets (ROA).

Other control variables such as leverage show mixed effects depending on the model tested. Leverage in several regression models shows a significant effect with a negative direction, indicating that the higher the leverage, the worse the company's financial performance. This is due to increased financial risk and greater debt burden, which can reduce the profitability of the company. However, in other models, leverage does not show a significant effect, indicating that the impact of leverage may depend on the context and firm-specific conditions. Capital intensity ratio, which measures the proportion of fixed assets in total assets, does not show a significant effect in all models. This suggests that the proportion of fixed assets in a firm's asset structure does not have a meaningful impact on investment efficiency or financial performance, either short or long term. Company age also shows mixed

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

results. In some models, company age has no significant effect on investment efficiency or short-term financial performance. However, in the long-term financial performance model, company age shows a significant effect with a positive direction. This indicates that older firms tend to have better long-term financial performance, possibly due to greater experience, reputation and stability. The sector dummy (CINT), which indicates whether the company is in a sector with more carbon disclosure, shows mixed results as well. In some models, the sector dummy shows a significant effect with a positive direction, indicating that business sectors with more carbon disclosure tend to be more investment efficient and have better financial performance. However, in other models, the sector dummy does not show a significant effect. Earning quality, which measures the quality of corporate earnings, does not show a significant effect in all models. This suggests that earnings quality has no meaningful impact on investment efficiency or financial performance, either short-term or long-term. Stock liquidity, which is measured by the frequency of stock trading, shows mixed effects depending on the model tested. In some models, stock liquidity shows a significant effect with a positive direction, indicating that companies with higher stock liquidity tend to have better financial performance. However, in the regression model with investment efficiency, stock liquidity shows no significant effect. This implies that companies with liquid stock trading have no impact on their investment efficiency.

5. CONCLUSION & RECOMMENDATION

This research presents the results of a study on the relationship between carbon disclosure, financial performance, and corporate investment efficiency. The main findings show that carbon disclosure has a negative impact on corporate financial performance. This suggests that the costs associated with carbon disclosure and efforts to meet higher environmental standards outweigh the financial benefits, both in the short and long term. Carbon disclosure results in a decline in short-term financial performance, while in the long run, it is perceived as a symbolic act that does not significantly affect financial performance. The findings also suggest that investment efficiency is affected by carbon disclosure. While carbon disclosure may decrease short-term financial performance, it may increase legitimacy and stakeholder trust, which in turn may increase firm sales and investment, thereby improving investment efficiency. The findings also highlight the importance of carbon disclosure in building trust and support from stakeholders, which can provide long-term benefits to the company in the form of investment efficiency and better financial performance.

Companies should improve the cost-efficiency of carbon disclosure by adopting innovative technologies and managerial practices, and strengthen communication with stakeholders to build long-term legitimacy. Carbon disclosure should be integrated into broader corporate strategies, so that it can have a measurable positive impact on investment efficiency and financial performance, while maintaining sustainability and corporate reputation.

6. REFERENCES

Bekker, P., & Wansbeek, T. (2016). Simple many-instruments robust standard errors through concentrated instrumental variables. Economics Letters, 149, 52–55. https://doi.org/https://doi.org/10.1016/j.econlet.2016.09.017

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

Biddle, G. C., Hilary, G., & Verdi, R. S. (2009). How does financial reporting quality relate to investment efficiency? Journal of Accounting and Economics, 48(2), 112–131. https://doi.org/https://doi.org/10.1016/j.jacceco.2009.09.001

Busch, T., & Hoffmann, V. H. (2011). How Hot Is Your Bottom Line? Linking Carbon and Financial Performance. Business & Society, 50(2), 233–265. https://doi.org/10.1177/0007650311398780

Chen, W., Zhang, L., Shi, L., Shao, Y., & Zhou, K. (2022). Carbon emissions trading system and investment efficiency: Evidence from China. Journal of Cleaner Production, 358, 131782. https://doi.org/https://doi.org/10.1016/j.jclepro.2022.131782

Choi, B. 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

Chondrakis, G., Serrano, C. J., & Ziedonis, R. H. (2021). Information disclosure and the market for acquiring technology companies. Strategic Management Journal, 42(5), 1024–1053. https://doi.org/https://doi.org/10.1002/smj.3260

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. Accounting, Organizations and Society, 33(4), 303–327. https://doi.org/https://doi.org/10.1016/j.aos.2007.05.003

Clarkson, P. M., Overell, M. B., & Chapple, L. (2010). Environmental Reporting and its Relation to Corporate Environmental Performance Forthcoming, Abacus Environmental Reporting and its Relation to Corporate Environmental Performance. http://ssrn.com/abstract=1751767Electroniccopyavailableat:https://ssrn.com/abstract=1751767Electroniccopyavailableat:http://ssrn.com/abstract=1751767Electroniccopyavailableat:https://ssrn.com/abstract=1751767

Comyns, B. (2016). Determinants of GHG Reporting: An Analysis of Global Oil and Gas Companies. Journal of Business Ethics, 136(2), 349–369. https://doi.org/10.1007/s10551-014-2517-9

Daddi, T., Todaro, N. M., De Giacomo, M. R., & Frey, M. (2018). A Systematic Review of the Use of Organization and Management Theories in Climate Change Studies. Business Strategy and the Environment, 27(4), 456–474. https://doi.org/https://doi.org/10.1002/bse.2015

Delmas, M. A., Nairn-Birch, N., & Lim, J. (2015). Dynamics of Environmental and Financial Performance: The Case of Greenhouse Gas Emissions. Organization & Environment, 28(4), 374–393. https://doi.org/10.1177/1086026615620238

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. The Accounting Review, 86(1), 59–100. http://www.jstor.org/stable/29780225

Dowell, G., Hart, S., & Yeung, B. (2000). Do Corporate Global Environmental Standards Create or Destroy Market Value? Management Science, 46(8), 1059–1074. http://www.jstor.org/stable/2661584

Francis, J., Nandan, D., & Olsson, P. E. R. (2008). Voluntary Disclosure, Earnings Quality, and Cost of Capital. Journal of Accounting Research, 46(1), 53–99. https://doi.org/https://doi.org/10.1111/j.1475-679X.2008.00267.x

Fu, S., Luo, X., & Liu, D. (2023). Carbon disclosure and stock price synchronization: from the perspective of analyst tracking. Environmental Science and Pollution Research, 30, 1–13. https://doi.org/10.1007/s11356-023-27579-w

Gonzalez, J. M. G., & Ramírez, C. Z. (2016). Organisational communication on climate change. International Journal of Climate Change Strategies and Management, 8(2), 286–316. https://doi.org/10.1108/IJCCSM-10-2014-0126

Guenther, E., Guenther, T., Schiemann, F., & Weber, G. (2015). Stakeholder Relevance for Reporting: Explanatory Factors of Carbon Disclosure. Business & Society, 55(3), 361–397. https://doi.org/10.1177/0007650315575119

Guidry, R. P., & Patten, D. M. (2012). Voluntary disclosure theory and financial control variables: An assessment of recent environmental disclosure research. Accounting Forum, 36(2), 81–90. https://doi.org/https://doi.org/10.1016/j.accfor.2012.03.002

Habib, A., & Hasan, M. M. (2021). Business Strategy and Labor Investment Efficiency*. International Review of Finance, 21(1), 58–96. https://doi.org/https://doi.org/10.1111/irfi.12254

Hahn, R., Reimsbach, D., & Schiemann, F. (2015). Organizations, Climate Change, and Transparency: Reviewing the Literature on Carbon Disclosure. Organization & Environment, 28(1), 80–102. https://doi.org/10.1177/1086026615575542

Hamid, F. S., & Loke, Y. J. (2021). Information disclosure and credit card repayments: evidence from Malaysia. International Journal of Bank Marketing, 39(7), 1479–1497. https://doi.org/10.1108/IJBM-03-2021-0082

Hayakawa, K., & Pesaran, M. H. (2015). Robust standard errors in transformed likelihood estimation of dynamic panel data models with cross-sectional heteroskedasticity. Journal of Econometrics, 188(1), 111–134. https://doi.org/https://doi.org/10.1016/j.jeconom.2015.03.042

Helfaya, A., Whittington, M., & Alawattage, C. (2019). Exploring the quality of corporate environmental reporting. Accounting, Auditing & Accountability Journal, 32(1), 163–193. https://doi.org/10.1108/AAAJ-04-2015-2023

Hornuf, L., Kück, T., & Schwienbacher, A. (2022). Initial coin offerings, information disclosure, and fraud. Small Business Economics, 58(4), 1741–1759. https://doi.org/10.1007/s11187-021-00471-y

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

Islam, M. A., & Deegan, C. M. (2008). Motivations for an organisation within a developing country to report social responsibility information. Accounting, Auditing & Accountability Journal, 21(6), 850–874. https://doi.org/10.1108/09513570810893272

Ji, Z., Yu, X., & Yang, J. (2020). Environmental information disclosure in capital raising. Australian Economic Papers, 59(3), 183–214. https://doi.org/https://doi.org/10.1111/1467-8454.12176

Jiang, Y., Luo, L., Xu, J., & Shao, X. (2021). The value relevance of corporate voluntary carbon disclosure: Evidence from the United States and BRIC countries. Journal of Contemporary Accounting & Economics, 17(3), 100279. https://doi.org/https://doi.org/10.1016/j.jcae.2021.100279

Jung, J., Herbohn, K., & Clarkson, P. (2018). Carbon Risk, Carbon Risk Awareness and the Cost of Debt Financing. Journal of Business Ethics, 150(4), 1151–1171. https://doi.org/10.1007/s10551-016-3207-6

Kalu, J. U., Buang, A., & Aliagha, G. U. (2016). Determinants of voluntary carbon disclosure in the corporate real estate sector of Malaysia. Journal of Environmental Management, 182, 519–524. https://doi.org/https://doi.org/10.1016/j.jenvman.2016.08.011

Kam, B. H., & Lai, M. K. (2018). Buyer-supplier exchange relationship: How do exchange partners behave across the relationship life-cycle? Transportation Research Part E: Logistics and Transportation Review, 113, 239–257. https://doi.org/https://doi.org/10.1016/j.tre.2017.12.007

Konar, S., & Cohen, M. A. (2001). Does the Market Value Environmental Performance? The Review of Economics and Statistics, 83(2), 281–289. http://www.jstor.org/stable/3211606

Laan, G. Van der, Van Ees, H., & Van Witteloostuijn, A. (2008). Corporate Social and Financial Performance: An Extended Stakeholder Theory, and Empirical Test with Accounting Measures. Journal of Business Ethics, 79(3), 299–310. https://doi.org/10.1007/s10551-007-9398-0

Liesen, A., Hoepner, A. G., Patten, D. M., & Figge, F. (2015). Does stakeholder pressure influence corporate GHG emissions reporting? Empirical evidence from Europe. Accounting, Auditing & Accountability Journal, 28(7), 1047–1074. https://doi.org/10.1108/AAAJ-12-2013-1547

Liu, H., Jiang, J., Xue, R., Meng, X., & Hu, S. (2022). Corporate environmental governance scheme and investment efficiency over the course of COVID-19. Finance Research Letters, 47, 102726. https://doi.org/https://doi.org/10.1016/j.frl.2022.102726

Luo, L. (2019). The influence of institutional contexts on the relationship between voluntary carbon disclosure and carbon emission performance. Accounting & Finance, 59(2), 1235–1264. https://doi.org/https://doi.org/10.1111/acfi.12267

Luo, L., Lan, Y.-C., & Tang, Q. (2012). Corporate Incentives to Disclose Carbon Information: Evidence from the CDP Global 500 Report. Journal of International Financial Management

& Accounting, 23(2), 93–120. https://doi.org/https://doi.org/10.1111/j.1467-646X.2012.01055.x

Luo, L., Tang, Q., & Lan, Y. (2013). Comparison of propensity for carbon disclosure between developing and developed countries. Accounting Research Journal, 26(1), 6–34. https://doi.org/10.1108/ARJ-04-2012-0024

Márquez, A. J. M., González, J. M. G., & Ramírez, C. Z. (2022). An international empirical study of greenwashing and voluntary carbon disclosure. Journal of Cleaner Production, 363, 132567. https://doi.org/https://doi.org/10.1016/j.jclepro.2022.132567

Matsumura, E. M., Prakash, R., & Vera-Muñoz, S. C. (2014). Firm-Value Effects of Carbon Emissions and Carbon Disclosures. The Accounting Review, 89(2), 695–724. http://www.jstor.org/stable/24468367

Mazzucato, M. (2018). Mission-oriented innovation policies: challenges and opportunities. Industrial and Corporate Change, 27(5), 803–815. https://doi.org/10.1093/icc/dty034

Peprah, A. A., Atarah, B. A., & Kumodzie-Dussey, M. K. (2023). Nonmarket strategy and legitimacy in institutionally voided environments: The case of Jumia, an African e-commerce giant. International Business Review, 102169. https://doi.org/https://doi.org/10.1016/j.ibusrev.2023.102169

Ramírez, C. Z., & González, J. M. G. (2015). The Value of Climate Change Reporting of Firms: The Spanish Case. International Journal of Social Ecology and Sustainable Development, 6, 90–103. https://doi.org/10.4018/IJSESD.2015100107

Sari, L. I. N., & Suaryana, I. G. N. A. (2014). Pengaruh Kualitas Laporan Keuangan pada Efisiensi Investasi Perusahaan Pertambangan. E-Jurnal Akuntansi Universitas Udayana.

Siddique, M. A., Akhtaruzzaman, M., Rashid, A., & Hammami, H. (2021). Carbon disclosure, carbon performance and financial performance: International evidence. International Review of Financial Analysis, 75, 101734. https://doi.org/https://doi.org/10.1016/j.irfa.2021.101734

Suchman, M. C. (1995). Managing Legitimacy: Strategic and Institutional Approaches. The Academy of Management Review, 20(3), 571–610. https://doi.org/10.2307/258788

Velte, P., Stawinoga, M., & Lueg, R. (2020). Carbon performance and disclosure: A systematic review of governance-related determinants and financial consequences. Journal of Cleaner Production, 254, 120063. https://doi.org/https://doi.org/10.1016/j.jclepro.2020.120063

Xie, J., Dai, H., Xie, Y., & Hong, L. (2018). Effect of carbon tax on the industrial competitiveness of Chongqing, China. Energy for Sustainable Development, 47, 114–123. https://doi.org/https://doi.org/10.1016/j.esd.2018.09.003

Yan, C., Mao, Z., & Ho, K.-C. (2022). Effect of green financial reform and innovation pilot zones on corporate investment efficiency. Energy Economics, 113, 106185. https://doi.org/https://doi.org/10.1016/j.eneco.2022.106185

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X

DOI: http://dx.doi.org/10.17509/xxxx.xxx
p- ISSN 2338-1507 e- ISSN 2541-061X