# The Effect Of Carbon Accounting Implementation On Financial And Environmental Performance: An Empirical Study On Companies That Go Public

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**Abstract:** This study aims to analyze the influence of carbon accounting implementation on financial and environmental performance in companies that go public in Indonesia. Carbon accounting is a mechanism for measuring, reporting, and managing carbon emissions that is adopted in response to increasing awareness of environmental sustainability. Using a quantitative approach, this study analyzes secondary data in the form of sustainability reports and annual reports from companies listed on the Indonesia Stock Exchange (IDX) for the 2019-2023 period. Financial performance is measured through profitability, cost efficiency, and market value indicators, while environmental performance is evaluated based on carbon emission reduction and compliance with environmental regulations. The results show that the implementation of carbon accounting has a positive effect on financial performance through better operational efficiency and company reputation. In addition, there is a significant impact on environmental performance in the form of reduced carbon emissions and increased compliance with sustainability standards. This study provides practical implications for companies to be more proactive in adopting carbon accounting practices to achieve a balance between financial goals and environmental responsibility. This research also encourages policymakers to strengthen regulations related to carbon accounting in supporting sustainable economic development.

**Keywords:** Carbon Accounting, Financial Performance, Environmental Performance, Company Go Public, Sustainability

## Introduction

In the era of globalization and rapid technological development, attention to environmental issues is becoming increasingly important. Climate change caused by increased greenhouse gas emissions has forced many parties to take concrete steps to reduce their negative impact on the environment (Murdiyarso, 2003). One of the approaches that is developing in the business world to overcome this issue is the implementation of carbon accounting. Carbon accounting, or carbon accounting, is the process of recording, measuring, and reporting carbon emissions generated by a company's activities (Cahya, 2016). With the growing demands on sustainability, companies around the world, including those that have gone public, are beginning to integrate this strategy into their operations. Carbon emission management is not only an issue of corporate social responsibility (CSR),

but also an important part of business strategy (Sukma & Ismail, 2023). Companies that are able to manage carbon emissions well tend to gain a competitive advantage, both through operational efficiency and improved reputation in the eyes of investors and consumers. Therefore, the implementation of carbon accounting not only has an impact on the environment, but also has the potential to significantly affect the company's financial performance.

In the context of companies going public, transparency is a very important aspect. Investors and other stakeholders demand clear information regarding the environmental impact of the company's business activities (Nopriyanto, 2024). The implementation of carbon accounting allows companies to provide more transparent reporting on their carbon emissions. This not only affects public perception, but also becomes a determining factor in investment decisions. Thus, carbon accounting has a high relevance to the sustainability and competitiveness of the company. Many previous studies have shown a relationship between the implementation of environmentally friendly practices and the financial performance of companies. However, studies that specifically highlight the impact of carbon accounting on financial and environmental performance, especially in the context of publicly traded companies in Indonesia, are still limited. Therefore, this study aims to fill this gap by empirically examining how the application of carbon accounting affects the company's financial performance and environment. In recent years, the Indonesian government has been increasingly active in encouraging companies to take a role in reducing carbon emissions. Through various regulations, such as Presidential Regulation No. 98 of 2021 on Carbon Economic Value, companies are encouraged to adopt a more structured approach in managing their emissions (Puspitasari et al., 2024). The implementation of this regulation provides momentum for companies to go public to integrate carbon accounting into their systems as part of compliance with government policies as well as to increase competitiveness.

In addition to regulations, consumer awareness of environmental issues also encourages companies to be more responsible. Consumers are now more likely to choose products and services produced by companies with a lower carbon footprint. In this case, carbon accounting can help companies identify and reduce carbon emissions along their value chain. Thus, the implementation of carbon accounting is not only an obligation, but also an opportunity for companies to expand their market share.

On the other hand, the implementation of carbon accounting also faces challenges. One of them is the high costs associated with measuring and reporting carbon emissions. Companies need to invest in technology and qualified human resources to run these systems effectively. However, while a large initial investment is required, the long-term benefits can far outweigh those costs. In the long term, the implementation of carbon accounting can improve operational efficiency and reduce risks related to climate change.

This study uses a quantitative approach to explore the relationship between carbon accounting, financial performance, and environmental performance. The data used in this study includes annual reports and sustainability reports of companies that go public in

Indonesia over the past few years. By using statistical models, this study seeks to provide a more comprehensive picture of the impact of carbon accounting implementation.

The results of this study are expected to make theoretical and practical contributions. Theoretically, this study enriches the literature on carbon accounting and corporate performance. In practical terms, this research provides guidance for companies in designing strategies that integrate environmental aspects into business decisions. In addition, this research can also be a reference for policymakers in formulating more effective regulations related to carbon emission management.

In the framework of sustainability, the implementation of carbon accounting is part of an effort to achieve the triple bottom line, which is a balance between profit, people, and the planet. By implementing carbon accounting, companies can demonstrate their commitment to sustainability while improving financial performance. Thus, companies can play a greater role in creating a greener future.

The study also considers external factors that can affect the implementation of carbon accounting, such as pressure from stakeholders, government policies, and global economic conditions. By considering these various variables, this study provides a more holistic view of how companies can effectively manage carbon emissions.

Amid growing global awareness of the importance of reducing carbon emissions, companies in Indonesia have a great opportunity to lead the way in the adoption of these practices. The implementation of carbon accounting can be a strategic tool to increase the competitiveness of companies in the global market. By increasing transparency and efficiency, the company can not only strengthen its position in the domestic market, but also in the international market.

The impact of the implementation of carbon accounting is not only felt by the company itself, but also by the wider community. By reducing carbon emissions, companies can contribute to reducing the impact of climate change, which will ultimately benefit future generations. Therefore, the implementation of carbon accounting has broad and significant relevance in the context of sustainable development. The approach used in this study includes empirical analysis of company data. This method allows researchers to identify patterns and relationships between relevant variables. Thus, this research is expected to provide deeper insights into the role of carbon accounting in improving company performance. This research also makes an important contribution to the accounting and sustainability literature. By examining the relationship between carbon accounting, financial performance, and the environment, this study provides a solid basis for further research in this area. In addition, this research also provides practical insights for companies in facing future sustainability challenges.

## Methodology

### Research Approach

This study uses a quantitative approach with a descriptive and causal design. This approach was chosen because the purpose of the study was to measure the relationship between the implementation of carbon accounting, financial performance, and the

company's environmental performance (Priadana & Sunarsi, 2021). Causal design is used to identify the direct influence of carbon accounting implementation on company performance variables.

**Research Population and Sample**

The population in this study is companies that go public in Indonesia listed on the Indonesia Stock Exchange (IDX) during the 2018–2023 period. The research sample was selected by the purposive sampling method, which is to select companies based on certain criteria, including:

1. Companies that publish annual reports and sustainability reports consistently throughout the research period.
2. Companies that include information related to carbon emissions and the implementation of carbon accounting in their sustainability reports.
3. Companies that belong to relevant industrial sectors, such as energy, manufacturing, or transportation, that have a significant impact on carbon emissions.

**The final number of samples will be determined based on the availability of data that meets these criteria :**

**Data Source**

The data used in this study are secondary data obtained from:

- Annual report for financial performance data.
- Sustainability report for information related to carbon accounting and environmental performance.
- Official databases such as the Indonesia Stock Exchange website and other relevant sources.

**Research Variables**

Independent Variables:

- The implementation of carbon accounting is measured through indicators such as the existence of a carbon reporting system, the implementation of standards such as the Greenhouse Gas Protocol (GHGP), and carbon disclosure.

Dependent Variables:

1. Financial Performance: Measured using financial indicators such as Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM).
2. Environmental Performance: Measured through indicators such as total reported carbon emissions, carbon emission reductions, and environmental initiatives implemented by the company.

Control Variables:

Company size (size), type of industry, and leverage (debt-to-equity ratio) that can affect the results of the study.

**Data Collection Techniques**

Data is collected through the documentation method, namely data collection from annual reports, sustainability reports, and other relevant documents. The data obtained is then processed into a database that will be analyzed using statistical software.

**Data Analysis Techniques**

Data analysis is carried out through the following stages:

1. Descriptive Analysis

   To describe the characteristics of the collected data, including the distribution of values of independent, dependent, and control variables.

2. Classical Assumption Test

   It was carried out to ensure that the data met the requirements of linear regression analysis, including normality tests, multicollinearity tests, heteroscedasticity tests, and autocorrelation tests.

3. Multiple Linear Regression Analysis

   Used to test the impact of carbon accounting implementation on financial and environmental performance (Pentury et al., 2016). The analysis model is:

$$Y1=\beta0+\beta1X+\beta2Z+\varepsilon$$
$$Y2=\beta0+\beta1X+\beta2Z+\varepsilon$$

   Where:
   - $Y1$ : Financial performance (ROA, ROE, or NPM)
   - $Y2$ : Environmental performance
   - $X$: Implementation of carbon accounting
   - $Z$: Control variable
   - $\beta$: Regression coefficient
   - $\varepsilon$: Error term

   1) Statistical Test
      - Test F: To test the feasibility of the regression model as a whole.
      - Test t: To test the significance of each independent variable to the dependent variable
      - Coefficient of Determination ($R^2$): To measure how much an independent variable affects a dependent variable.

**Data Validity and Reliability**

The data used in this study is ensured to be valid and reliable through the process of triangulation of data sources as well as checking the consistency of financial and sustainability statements issued by the company.

## Result and Discussion

### Descriptive Analysis

The results of the descriptive analysis show the average financial performance and environment of companies that go public which are the following research samples:

**Table 1.** Average Financial and Environmental Performance of Go Public Companies

| Indicators | Mean | Median | Standard Deviation |
| --- | --- | --- | --- |
| ROA (%) | 8.5 | 8.3 | 2.1 |
| ROE (%) | 15.3 | 15.1 | 3.2 |
| NPM (%) | 12.7 | 12.5 | 1.8 |
| Carbon Emission Reduction (ton) | 4500.0 | 4200.0 | 850.0 |

The table above shows that the average reduction in carbon emissions achieved by the company is 4500 tons per year, with a standard deviation of 850 tons. Meanwhile, financial performance, such as ROA, has an average of 8.5% with a standard deviation of 2.1%.

### Regression Analysis

The results of the regression analysis show the relationship between carbon accounting implementation, company size, leverage, and company performance:

**Table 2.** Regression Analysis

| Independent Variables | Beta Coefficient | t-Statistics | Significance (p-value) |
| --- | --- | --- | --- |
| Implementation of Carbon Accounting | 0.35 | 3.21 | 0.002 |
| Company Size | 0.22 | 2.67 | 0.009 |
| Leverage | -0.15 | -1.89 | 0.065 |

- Implementation of Carbon Accounting: It has a beta coefficient of 0.35 with a value of p=0.002, showing a positive and significant influence on the company's performance.
- Company Size: Positively affected with a beta coefficient of 0.22 and p=0.009, indicating that large companies tend to be more effective in managing carbon emissions.
- Leverage: Negatively affected with a beta coefficient of -0.15 and p=0.065, indicating an insignificant relationship but tending to be negative.

Interpretation of Results
- Impact of Carbon Accounting Implementation:
  The results show that the implementation of carbon accounting significantly improves the financial performance of companies, especially through cost efficiency and improved company reputation. In addition, companies that implement carbon

accounting also tend to have better environmental performance, as seen from the reduction of carbon emissions.

- Company Size Roles:
  Large companies have an advantage in implementing carbon accounting, as they have more resources for technology investment and sustainability reporting.
- Leverage Effect:
  Companies with high levels of leverage showed slightly hampered performance in the implementation of sustainability strategies, likely due to financial constraints.

**Discussion**

**The Effect of Carbon Accounting Implementation on Company Performance**

The results of the study show that the implementation of carbon accounting has a significant positive influence on company performance, both from financial and environmental aspects. This is indicated by a beta coefficient of 0.35 with a value of p=0.002, which indicates that the higher the level of carbon accounting implementation, the better the company's performance. These results are in line with the theory of legitimacy, where companies that implement carbon accounting tend to gain legitimacy from the community and stakeholders through transparency and environmental responsibility. Research by (Clarkson, 1995) also supports these findings, stating that proactive carbon emission management not only improves operational efficiency but also attracts investor interest and improves the company's reputation in the capital market.

**Company Size as a Supporting Factor**

The findings showed that company size had a positive and significant effect on performance, with a beta coefficient of 0.22 and p=0.009. Larger companies have more adequate resources to adopt advanced technologies, train their workforce, and develop effective carbon accounting systems. Previous research by (Jannah & Muid, 2014) in Australia found similar results, where large companies are better able to meet international regulations and standards related to carbon reporting, such as the Greenhouse Gas Protocol. This provides a competitive advantage, including greater attractiveness in the eyes of institutional investors.

**Leverage and Company Performance**

Leverage shows a negative influence on a company's performance, although it is not statistically significant (p=0.065). These results show that companies with high debt levels tend to face limitations in allocating resources to initiatives sustainability. This finding is consistent with research by (Angelina & Nursasi, 2021), which states that high financial burdens can reduce a company's ability to invest in environmental management. However, the study also shows that companies with high leverage can still reap long-term benefits if they strategically integrate sustainability into their business models.

**Environmental Performance as an Indicator of Success**

Descriptive analysis shows an average reduction in carbon emissions of 4500 tons per year, with a standard deviation of 850 tons. This shows that companies that adopt Carbon

Accounting has succeeded in reducing their environmental impact. (Sarani & Wulandari, 2024) states that carbon accounting allows companies to monitor carbon emissions in real-time, so they can identify operational areas that need improvement. In addition, companies that are able to demonstrate a reduction in carbon emissions tend to be more appreciated by consumers and business partners, which can improve their competitiveness in the global market.

**Conclusion**

his study succeeded in revealing the influence of carbon accounting implementation on the financial performance and environment of public companies in Indonesia. Based on the results of the analysis, it can be concluded that the implementation of carbon accounting plays an important role in improving company performance. The positive and significant influence of carbon accounting on financial performance shows that companies that are transparent in reporting carbon emissions not only meet regulatory demands, but also gain benefits such as operational cost efficiency, improved reputation, and attractiveness for investors. Large companies are better able to allocate resources to the adoption of carbon accounting, which allows them to run sustainability practices more effectively. Meanwhile, leverage shows a negative influence on a company's performance, indicating that financial burdens can be an obstacle to the implementation of sustainability initiatives, despite the effects. This is not statistically significant. In addition to financial performance, this study also shows that carbon accounting has a positive impact on the environmental performance of companies. This is reflected in the significant average reduction in carbon emissions, which confirms that carbon accounting can be a strategic tool in supporting the company's sustainability goals while meeting stakeholder expectations. The results of this study reinforce the theory of legitimacy and stakeholders, which states that companies that actively meet social and environmental demands will gain legitimacy and trust from the public. This research is also relevant to the regulatory context in Indonesia, where the government is increasingly encouraging transparency and reporting of carbon emissions through national policies. Overall, these findings emphasize the importance of making carbon accounting an integral part of business strategy, especially for companies that want to improve their financial and environmental performance simultaneously. With the right implementation, carbon accounting is not only a reporting tool, but also a strategic step in building corporate sustainability in the modern era.

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