

The Effect of Green Accounting, Profitability, and Firm Size on the Firm Value of Energy Companies Listed on the IDX From 2020 To 2024

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Abstract. This paper summarizes a quantitative study examining whether green accounting, profitability, and firm size influence the market value of energy companies listed on the Indonesia Stock Exchange (IDX) during 2020-2024. The research problem arises from the tension between environmental responsibility and financial performance in the energy sector, where firms are expected to create shareholder value while managing environmental impacts. The study uses firm value as the dependent variable, measured by Tobin's Q. Green accounting is measured by Environmental Expenditure, profitability by Return on Assets (ROA), and firm size by the natural logarithm of total assets. Secondary data were collected from annual financial reports and analyzed using panel data regression with EViews 10. The sample consists of 25 energy companies over five years, producing 125 firm-year observations. Model selection tests indicate that the Random Effects Model is the most appropriate estimation model. The findings show that green accounting has a negative but insignificant effect on firm value. In contrast, profitability and firm size have positive and significant effects on firm value. These results suggest that investors in the energy sector still respond more strongly to financial performance and asset scale than to environmental expenditure disclosure. The study contributes by providing updated empirical evidence for the post-pandemic energy sector in Indonesia and by clarifying the relative importance of environmental and financial indicators in shaping market value.

Keywords: Green Accounting, Profitability, Firm Size, Firm Value.

INTRODUCTION

Research Background

The energy sector plays a central role in supporting national economic activity because it provides the resources needed by industries, households, transportation, and other productive sectors. Energy companies contribute to economic growth, employment, and the stability of energy supply. However, the sector is also closely associated with environmental problems such as emissions, land disturbance, waste, and pollution. Because

of these impacts, energy companies are increasingly expected to balance profitability with environmental sustainability (Sunarmin, 2020). This condition makes the sector a relevant context for studying how environmental and financial factors shape firm value.

Research Motivation

Firm value represents how the market assesses a company's current performance and future prospects. A high firm value indicates that investors believe the company can generate sustainable returns and manage risks effectively (Sudana, 2011). In capital-intensive sectors such as energy, market value is not determined only by current profit, but also by expectations related to assets, regulations, commodity prices, environmental responsibility, and long-term business continuity (Putri & Wardhani, 2025). Therefore, examining firm value in the energy sector is important because the sector is exposed to financial, operational, environmental, and regulatory pressures at the same time.

Research Gap

Previous studies provide mixed findings regarding the influence of green accounting, profitability, and firm size on firm value (Alghifari et al., 2022; Arigestawan & Astawa, 2025). Some studies show that profitability and firm size improve firm value, while the effect of green accounting remains inconsistent. In addition, the period from 2020 to 2024 reflects the post-pandemic recovery phase, changes in energy prices, and increasing attention to sustainability. These conditions create a need to re-examine whether environmental expenditure, profitability, and asset scale affect the value of Indonesian energy companies listed on the IDX.

Research Questions

This study addresses the following research questions:

1. Does green accounting affect the firm value of energy companies listed on the IDX during 2020–2024?
2. Does profitability affect the firm value of energy companies listed on the IDX during 2020–2024?
3. Does firm size affect the firm value of energy companies listed on the IDX during 2020–2024?

Research Objectives

This study aims to examine and analyze the effect of green accounting, profitability, and firm size on the firm value of energy companies listed on the IDX during 2020–2024.

LITERATURE REVIEW

Theory of the Firm

The main theoretical foundation used in this study is the Theory of the Firm. This theory explains that a company is established to maximize shareholder wealth and increase firm value through effective resource management, investment decisions, financing decisions, and operational efficiency (Brigham & Houston, 2019). From this perspective, firm value reflects the success of management in transforming company resources into economic benefits (Kieso et al., 2018). When a company can manage its assets efficiently, generate profit, and maintain stable operations, investors are more likely to view the company positively.

Firm Value

Firm value is the market's assessment of the company's overall performance and future prospects (Kieso et al., 2018). In this study, firm value is measured using Tobin's Q, which compares the market value of the company with the book value of its assets. Tobin's Q is appropriate for energy companies because the sector generally has large fixed assets, high capital intensity, and strong exposure to regulatory and environmental risks (Dakhlallah et al., 2020). A Tobin's Q value above one indicates that the market values the company above its recorded asset value, suggesting positive expectations about future performance.

Green Accounting

Green accounting is an accounting approach that recognizes, measures, and reports environmental costs associated with business activities (Almunawwaroh et al., 2022). In the energy sector, green accounting is important because company operations often create environmental impacts that require monitoring, disclosure, and restoration. Environmental costs may include rehabilitation, reclamation, waste management, environmental protection, and other activities related to reducing or managing operational impacts. By disclosing these costs, companies can demonstrate accountability and transparency to stakeholders (Adyaksana & Pronosokodewo, 2020).

Profitability

Profitability refers to a company's ability to generate profit from the resources it controls (Kasmir, 2019). In this study, profitability is measured by Return on Assets (ROA), which compares net income with total assets. ROA shows how efficiently management uses company assets to produce earnings. A higher ROA indicates that assets are being used effectively and that the company has stronger operational performance. For investors, profitability is one of the most important signals because it is directly related to returns, dividends, growth potential, and business sustainability (Brigham & Houston, 2019).

Firm Size

Firm size refers to the scale of a company's operations and resources. It can be measured using total assets, sales, or number of employees. This study uses the natural logarithm of total assets because it reduces the gap between very large and smaller companies and makes the data more proportional for statistical analysis. Large firms usually have greater access to financing, broader operations, stronger bargaining power, and better capacity to absorb economic shocks Kasmir, 2019). These characteristics may increase investor confidence and lead to a higher firm value (Kieso et al., 2018).

METHODS

Research Design

This study uses a quantitative research design because it examines measurable relationships among variables using numerical data and statistical testing. The method applied is panel data regression because the data combine cross-sectional observations from several companies with time-series observations from 2020 to 2024. Panel data regression allows the researcher to observe changes over time while also comparing differences among companies. This approach is appropriate for testing whether green accounting, profitability, and firm size influence firm value.

Variables and Measurement

The dependent variable is firm value, measured by Tobin's Q. Tobin's Q compares market value with the book value of total assets and reflects how the market values the company relative to its recorded resources. The independent variables are green accounting, profitability, and firm size. Green accounting is measured by Environmental Expenditure, which compares environmental costs with net profit after tax. Profitability is measured by Return on Assets, calculated by dividing net profit by total assets. Firm size is measured by the natural logarithm of total assets.

Unit of Analysis

The unit of analysis is energy sector companies listed on the Indonesia Stock Exchange. These companies were selected because their business activities are closely related to energy resources and environmental impacts. The research period covers five years, from 2020 to 2024. This period is useful because it captures the post-pandemic economic recovery, changes in energy commodity prices, and rising sustainability concerns.

Population and Sample

The population consists of all energy sector companies listed on the IDX during the 2020-2024 period. The sample was selected using purposive sampling, meaning that companies were chosen based on specific criteria related to the research objectives. The

criteria include being listed and actively operating during the period, publishing complete annual financial reports, reporting profits consistently, providing publicly accessible financial statements, and having complete data for all research variables. Based on these criteria, 25 companies were selected, resulting in 125 observations over five years.

Data Type and Sources

The study uses secondary data because the required information was obtained from documents that had already been published. The main data sources are annual financial reports available through the IDX official website and the official websites of the selected companies. These reports provide the financial and environmental information needed to calculate Tobin's Q, Environmental Expenditure, ROA, and firm size. The use of secondary data is suitable because financial reports are official, verifiable, and consistent across companies.

Data Collection and Analysis

The data were collected using documentation. The researcher reviewed annual financial reports and extracted the values required for each variable. After the data were compiled, they were processed using EViews 10. The analysis involved panel data model selection tests, classical assumption tests, and hypothesis testing. The model selection tests included the Chow test and Lagrange Multiplier test. Hypothesis testing included the t-test, F-test, and coefficient of determination test.

RESULTS AND DISCUSSION

Research Object

The final sample consists of 25 energy sector companies listed on the IDX, observed for five years from 2020 to 2024. This produces 125 firm-year observations. The sample was selected from 66 companies in the energy sector. Companies that did not consistently report profits during the period were excluded, while companies with complete annual reports and complete variable data were retained. The selected sample is therefore focused on companies that are financially active, profitable, and able to provide sufficient data for analysis.

Model Selection Results

The Chow test was used to compare the Common Effects Model and the Fixed Effects Model. The probability value of the cross-section F statistic was 0.0738, which is greater than 0.05. This result indicates that the Common Effects Model is preferred over the Fixed Effects Model. The Lagrange Multiplier test was then used to compare the Common Effects Model and the Random Effects Model. The probability value was 0.0470, which is lower than 0.05. This result indicates that the Random Effects Model is more

appropriate. Therefore, the Random Effects Model was selected for the main regression analysis.

Classical Assumption Tests

The normality test showed a Jarque-Bera probability of 0.536965, which is greater than 0.05, indicating normally distributed residuals. The heteroscedasticity test showed that the probability values for Green Accounting, ROA, and firm size were all above 0.05, indicating no heteroscedasticity problem. The multicollinearity test showed low correlations among the independent variables, all below the threshold of 0.80. The Durbin-Watson statistic was 2.158246, falling within the acceptable range and indicating no autocorrelation problem.

Regression Results

TABLE 1. *Random Effects Model (REM)*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.93815	3.757860	-3.176848	0.0019
GA	-0.218004	1.045541	-0.208509	0.8352
ROA	1.755058	2.885401	2.172651	0.0016
LNTA	0.473369	0.132518	3.572108	0.0005

The regression analysis was conducted using the Random Effects Model (REM), which had been selected as the most appropriate model based on the previous model selection tests. The regression results show that each independent variable has a different effect on firm value. Green Accounting, measured by Environmental Expenditure, has a coefficient value of -0.218004 with a probability value of 0.8352. Since the probability value is higher than the significance level of 0.05, Green Accounting does not have a significant effect on firm value. The negative coefficient indicates that an increase in environmental expenditure is associated with a decrease in firm value; however, this relationship is not statistically significant. Therefore, it cannot be concluded that Green Accounting directly influences the market value of energy companies listed on the IDX during the 2020–2024 period.

Profitability, measured by Return on Assets (ROA), has a coefficient value of 1.755058 with a probability value of 0.0016. Since the probability value is lower than 0.05, profitability has a positive and significant effect on firm value. This finding indicates that companies with higher profitability tend to have higher market value. In other words, the ability of a company to generate profit from its total assets is positively valued by investors. A higher ROA reflects better asset efficiency and stronger financial performance, which can increase investor confidence and encourage a higher valuation in the capital market.

Firm size, measured by the natural logarithm of total assets (LNTA), has a coefficient value of 0.473369 with a probability value of 0.0005. Since the probability value

is also lower than 0.05, firm size has a positive and significant effect on firm value. This result indicates that larger companies tend to have higher firm value. Companies with larger total assets are generally perceived as more stable, more capable of expanding their business operations, and better prepared to manage business risks. As a result, investors may view larger firms as having stronger long-term prospects, which contributes to an increase in firm value.

Simultaneous Effect and Explanatory Power

TABLE 2. Simultaneous Test Results (F-Test)

Weighted Statistics			
R-squared	0.971466	Mean dependent var	1.146126
Adjusted R-squared	0.874762	S.D. dependent var	0.609637
S.E. of regression	0.586406	Sum squared resid	41.60850
F-statistic	4.339846	Durbin-Watson stat	2.158246
Prob(F-statistic)	0.006086		

The simultaneous test, or F-test, was used to determine whether Green Accounting, profitability, and firm size jointly influence firm value. The result shows an F-statistic value of 4.339846 with a probability value of 0.006086. Since the probability value is lower than 0.05, it can be concluded that the independent variables simultaneously have a significant effect on firm value. This means that Green Accounting, profitability, and firm size, when tested together, are able to explain changes in the market value of energy companies listed on the IDX during the 2020–2024 period.

The coefficient of determination, or R-squared, is 0.971466. This value indicates that 97.14% of the variation in firm value can be explained by the three independent variables included in the model, namely Green Accounting, profitability, and firm size. Meanwhile, the remaining 2.86% is explained by other factors outside the research model, such as leverage, liquidity, corporate governance, commodity price fluctuations, macroeconomic conditions, investor sentiment, and other financial or non-financial variables.

Discussion

The insignificant effect of Green Accounting suggests that environmental expenditure has not yet become a dominant factor in investors' valuation decisions. Investors may still prioritize financial indicators, especially profitability and asset scale, when evaluating energy companies. Another possible explanation is that environmental disclosure may not be sufficiently detailed or comparable across companies, making it difficult for investors to assess its real value. Therefore, although green accounting is important for accountability, it may not directly influence market value during the study period.

Based on the findings, profitability and firm size are proven to be significant factors influencing the firm value of energy companies listed on the IDX during the 2020–2024 period. These results indicate that investors place strong attention on financial performance and company scale when making valuation decisions. Companies with higher profitability and larger assets are more likely to be perceived as financially strong, stable, and capable of generating sustainable returns.

CONCLUSIONS

Conclusion

This study concludes that Green Accounting, measured by Environmental Expenditure, does not significantly affect firm value. This finding indicates that environmental costs have not yet become a primary consideration for investors in valuing energy companies. Profitability, measured by ROA, has a positive and significant effect on firm value, meaning that companies with stronger profit-generating ability tend to receive better market valuation. Firm size, measured by the natural logarithm of total assets, also has a positive and significant effect on firm value, showing that larger companies are generally perceived as more stable and attractive by investors.

Implications

The findings have several implications. For company management, improving profitability and managing assets efficiently remain important strategies for increasing firm value. At the same time, companies should improve the quality and transparency of environmental disclosure so that green accounting information becomes more useful for investors. For investors, the findings suggest that profitability and firm size are important indicators when evaluating energy sector firms, but environmental information should still be considered as part of long-term risk assessment. For regulators, the findings indicate the need for clearer and more standardized environmental reporting guidelines.

Limitations and Future Research

This study has several limitations. First, it focuses only on energy sector companies listed on the IDX, so the findings may not apply to other industries. Second, green accounting is measured only by Environmental Expenditure, while environmental responsibility may also be reflected in sustainability reports, emissions data, environmental ratings, or ESG scores. Third, the study covers only the 2020–2024 period. Future research can expand the sample to other sectors, use additional environmental indicators, extend the observation period, and include other variables such as leverage, liquidity, corporate governance, commodity prices, or ESG disclosure quality. These additions may provide a more complete explanation of firm value.

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