# Study on the Influence of ESG Information Disclosure Level on Enterprise Value of Energy Enterprises

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**Abstract.** This paper selects 105 energy industry companies listed on the main board of A-shares in Shenzhen and Shanghai during the period of 2018-2022 as a sample, and empirically examines the impact of ESG disclosure level on the enterprise value of energy companies based on the stakeholder theory and using the TobinQ model. The results show that the level of ESG disclosure is significantly and positively related to corporate value, and good ESG performance can increase the corporate value of listed companies. The above results are robust and based on stakeholder theory, provide empirical evidence for stakeholder participation in cooperation, innovative development of enterprises and policy regulation.

**Keywords:** energy sector; ESG performance; enterprise value; disclosure.

## 1 Introduction

With the global focus on climate change, social responsibility and corporate governance transparency, ESG (Environmental, social, and governance) disclosure is becoming a focus of attention for investors, regulators and the public in the economic sphere[1]. As an important pillar of the country's economic development, the state of development of China's energy industry has a significant impact on national energy security and economic stability [2]. Despite the increasing popularity of ESG disclosure, research on the specific mechanism and extent of its impact on firm value is still relatively limited. Specifically, the Chinese energy industry is lacking in empirical research. The law in the area of ESG disclosure is also not very mature[3]. The present objective endeavors to bridge the identified research void or gap in the existing literature by selecting a sample of 105 energy industry companies listed on the main board of A-shares in Shenzhen and Shanghai during the period of 2018-2022 ( Electricity, heat, gas and water production and supply industry in the CSRC's industry category) to conduct a study on the impact of ESG disclosure on corporate value, to provide new theoretical and empirical support for exploring the related field and to provide useful references and suggestions for corporate practice and legal policy makers.


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## 2 Theoretical Background and Hypothesis Development

Since the early 1960s, the international community signed a series of important programmatic documents, which enabled ESG to move from the stage of theoretical exploration to the stage of substantive practice[4]. The concept of ESG was formally introduced in the year 2004 via the publication of the seminal report by the UN Global Compact Initiative, titled "Who Cares Wins." [5]. The ESG investment framework includes index ratings, disclosure and investment guidelines. Of particular relevance to China's energy listed companies is the aspect of information disclosure, which is an important foundation for the successful listing of China's energy listed companies[6]. Chinese energy companies must prioritize ESG disclosure. [7]. By doing so, they can drive corporate value growth by integrating environmentally and socially responsible practices into their operations, fostering resilience, and positioning their businesses for long-term success. [8]. Based on stakeholder theory, we can make the following hypothesis: the ESG performance of Chinese energy firms has a positive impact on the firms' corporate value.

## 3 Research Design

In the present study, we undertake an examination of energy sector enterprises listed on the primary exchanges of Shenzhen and Shanghai A-share markets spanning the years 2018 to 2022, focusing specifically on the subset classified under the revamped industry categorization of Electricity, Heating, Gas, and Water Production & Supply, as defined by the China Securities Regulatory Commission (CSRC). To ensure data integrity and representativeness, instances involving incomplete records or entities under special regulatory interventions are systematically excluded, culminating in a refined dataset encompassing 105 exemplary energy industry corporations. The Environmental, Social, and Governance (ESG) ratings pertinent to these companies are sourced from the WIND ESG database, while complementary financial and operational data are retrieved from the Choice Financial database, thereby facilitating a comprehensive and rigorous analysis in line with academic rigor and research standards.

After extensive reference to the fruitful results of scholars at home and abroad in the field of enterprise value research, combined with the actual situation of the current enterprise and future growth potential, this paper decides to adopt TOBINQ value as the core explanatory variable to characterize the value of the enterprise.

$$\text{TOBINQ} = \frac{MVE+PS+DEBT}{TA} \tag{1}$$

Where: MVE standing for the market capitalization of the company's outstanding shares; PS standing for the value of the preferred stock; DEBT standing for the net debt of the company; TA standing for the book value of the company's total assets.

To ensure the accuracy and reliability of the model, this study further incorporates several core control variables, formulated an intricate multiple regression model.

$$TOBINQ=\beta_0+\beta_1 ESG_{it}+\beta_2 SIZE_{it}+\beta_3 LEV_{it}+\beta_4 ATO_{it}+\beta_5 CASHFLOW_{it} +\beta_6 FIXED_{it}+\beta_7 GROWTH_{it}+\beta_8 YEAR^{\varepsilon}{}_{it} \quad (2)$$

The model under consideration incorporates a foundational intercept term denoted as $\beta_0$,alongside regression coefficients ranging from $\beta_1$ to $\beta_8$,each assigned to a distinct variable. The presence of $\varepsilon$ signifies the inclusion of a random error term, accounting for unpredictable variations. The index$i(i = 1,2 \ldots 9)$ signifies the variability across individual observation samples.

## 4 Empirical Results and Discussion

Table 1 summarizes the statistical characteristics of a number of cor-porate financial metrics. The table above summarizes the statistical characteristics of a number of corporate financial metrics. The distribution of enterprise value and total asset turnover is more dispersed, showing greater variations in financial risk and efficiency in utilizing assets. Smaller standard deviations in ESG disclosure levels and gearing ratios indicate that companies are performing more consistently in terms of sustainability and financial leverage. The variability in firm size, as indicated by the standard deviation, remains minimal, pointing towards a lack of significant disparities in the magnitudes of individual firms. The large standard deviations of fixed assets, operating activities, operating income, total liabilities and total assets reveal that these indicators differ significantly across firms. The median reflects the corresponding central tendency in each indicator and provides an important reference for understanding the distribution of the data.

**Table 1.** Descriptive Statistics

| name | min | max | average | standard deviation | upper quartile |
|---|---|---|---|---|---|
| TOBINQ | 1.347 | 26.209 | 4.322 | 1.484 | 4.253 |
| ESG | 3.840 | 8.510 | 6.064 | 0.776 | 6.000 |
| ATO | 0.024 | 1.908 | 0.372 | 0.249 | 0.307 |
| SIZE | 18.756 | 26.943 | 23.482 | 1.472 | 23.468 |
| FIXED ASSETS | 1.660 | 28931.162 | 251.648 | 533.160 | 59.047 |
| FIXED | 0.019 | 0.954 | 0.465 | 0.193 | 0.469 |
| OPREATING ACTIVITY | -63.505 | 466.977 | 31.612 | 71.903 | 7.714 |
| GROWTH | -0.561 | 22.099 | 0.231 | 1.309 | 0.100 |
| CASHFLOW | -0.397 | 0.240 | 0.061 | 0.052 | 0.062 |
| OPREATING REVENUE | 0.232 | 2467.248 | 143.069 | 290.655 | 44.290 |
| LEV | 0.750 | 76.558 | 2.467 | 5.330 | 1.712 |
| TOTAL LIABILITY | 0.31 | 3760.619 | 288.546 | 570.049 | 89.433 |
| TOTAL ASSET | 1.398 | 5026.060 | 455.603 | 834.366 | 155.609 |
| Number of active cases | | | 105 | | |

Note: The financial raw data in the above table are in billions.

This study employs the SPSS statistical software package to initially scrutinize the interrelationships among all investigative variables. The results are shown in Table 2. Enterprise value and ESG show a significant positive correlation, with a correlation coefficient value of 0.238. Enterprise value shows a significant positive relationship with total asset turnover, firm size, fixed assets, fixed assets ratio, operating actiities, firm growth, cash flow ratio, operating income, total liability and total asset show significant positive correlation. Enterprise value and gearing ratio show a significant negative correlation, with a correlation coefficient value of -0.151. A lower LEV indicates that the enterprise has less debt and is relatively less risky, and a high enterprise value implies that the market's expectation of the enterprise's future profitability is higher than the enterprise's current asset value.

**Table 2.** Correlation Analysis

| | TOBINQ | ESG | ATO | SIZE | F/A | FIXED | O/A | GROWTH | CASHFLOW | O/R | LEV | T/L | T/A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOBINQ | 1 | | | | | | | | | | | | |
| ESG | 0.238** | 1 | | | | | | | | | | | |
| ATO) | 0.295** | 0.106* | 1 | | | | | | | | | | |
| SIZE | 0.192** | 0.338** | -0.137** | 1 | | | | | | | | | |
| FIXED ASSETS (F/A) | 0.170** | 0.350** | -0.102* | 0.699** | 1 | | | | | | | | |
| FIXED | 0.249** | -0.063 | -0.031 | 0.227** | 0.346** | 1 | | | | | | | |
| OPREATING ACTIVITY (O/A) | 0.155** | 0.339** | -0.089* | 0.647** | 0.934** | 0.299** | 1 | | | | | | |
| GROWTH | 0.897** | -0.030 | 0.112** | 0.034 | -0.012 | 0.002 | -0.009 | 1 | | | | | |
| CASHFLOW | 0.117** | 0.057 | 0.131** | 0.055 | 0.123** | 0.315** | 0.234** | -0.004 | 1 | | | | |
| OPREATING REVENUE (O/R) | 0.195** | 0.373** | 0.127** | 0.649** | 0.833** | 0.189** | 0.743** | 0.012 | 0.064 | 1 | | | |
| LEV | -0.151** | -0.009 | -0.089* | -0.172** | -0.072 | 0.012 | -0.063 | -0.025 | -0.056 | -0.074 | 1 | | |
| TOTAL LIABILITY (T/L) | 0.161** | 0.360** | -0.087* | 0.718** | 0.964** | 0.254** | 0.874** | -0.005 | 0.068 | 0.882** | -0.084 | 1 | |
| TOTAL ASSET (T/A) | 0.157** | 0.378** | -0.097* | 0.748** | 0.980** | 0.249** | 0.913** | -0.009 | 0.086* | 0.874** | -0.080 | 0.986** | 1 |

* p<0.05 ** p<0.01

The benchmark regression outcomes, presented in Table 3, reveal the model equation as follows: Firm Value (TOBINQ) = -0.807 + 0.496ESG Score + 1.020Asset Turnover (ATO) + 0.027Firm Size (SIZE) - 0.000Tangible Assets + 2.075Fixed Asset Ratio (FAR) + 0.000Operational Activities (OPERATIONS) + 1.000Growth Potential (GROWTH) - 0.181Cash Flow Efficiency (CASHFLOW) - 0.000Revenue Generation (REVENUE) - 0.031Equity Leverage (LEV) + 0.000Total Liabilities (TL) - 0.000Total Assets (TA). Notably, the model's R-squared value stands at 0.989, signifying that 98.9% of the variations in firm value can be attributed to the explanatory power of ESG, ATO, Firm Size, FAR, Operational Activities, Growth Potential, Cash Flow Efficiency, Revenue Generation, Equity Leverage, Total Liabilities, and Total Assets. This underscores the nascent stage of ESG disclosure enhancement among companies. Specifically, firms' ESG performance, total asset turnover, firm size, fixed asset ratio, firm growth potential, and total debt level are significantly and positively asso-ciated with firm value, while cash flow ratio and gearing ratio show a negative impact on firm value. Conversely, it appears that Total Fixed Assets, the Performance Metrics of Operational Activities, Operating Revenue, and the Aggregate of Assets do not exhibit a noteworthy influence on the valuation of the firm. The process of constructing firm value is illuminated by these findings, offering invaluable insights.

**Table 3.** Regression Analysis

| | Non-standardized coefficient | | Standardized coefficient | t | p | covariance diagnosis | |
|---|---|---|---|---|---|---|---|
| | B | standard error | Beta | | | VIF | tolerance level |
| a constant (math.) | -0.807 | 0.180 | - | -4.492 | 0.000** | - | - |
| ESG | 0.496 | 0.010 | 0.259 | 50.607 | 0.000** | 1.273 | 0.785 |
| ATO | 1.020 | 0.032 | 0.171 | 32.192 | 0.000** | 1.371 | 0.730 |
| SIZE | 0.027 | 0.008 | 0.027 | 3.485 | 0.001** | 2.961 | 0.338 |
| FIXED ASSETS | -0.000 | 0.000 | -0.014 | -0.448 | 0.654 | 5.638 | 0.020 |
| FIXED | 2.075 | 0.047 | 0.270 | 43.979 | 0.000** | 1.822 | 0.549 |
| OPREATING ACTIVITY | 0.000 | 0.000 | 0.000 | 0.012 | 0.990 | 1.987 | 0.091 |
| GROWTH | 1.000 | 0.005 | 0.881 | 191.824 | 0.000** | 1.024 | 0.977 |
| CASHFLOW | -0.181 | 0.150 | -0.006 | -1.209 | 0.227 | 1.333 | 0.750 |
| OPREATING REVENUE | -0.000 | 0.000 | -0.006 | -0.572 | 0.568 | 6.070 | 0.165 |
| LEV | -0.031 | 0.001 | -0.110 | -23.445 | 0.000** | 1.075 | 0.930 |
| TOTAL LIABILITY | 0.000 | 0.000 | 0.079 | 2.514 | 0.012* | 8.066 | 0.021 |
| TOTAL ASSET | -0.000 | 0.000 | -0.071 | -1.460 | 0.145 | 4.183 | 0.009 |
| R 2 | | | | 0.989 | | | |
| Adjustment R 2 | | | | 0.989 | | | |
| individually | | | | containment | | | |
| Year (YEAR) | | | | containment | | | |
| F | | | | 3998.224*** | | | |
| D-W value | | | | 1.435 | | | |

The method of replacing variables and lagging one period is used to carry out, Table 4 presents the detailed, specific outcomes of the analysis. The subsequent model equation, stemming from this analysis, is outlined as follows:

The model equation for Tobin's q-ratio lagged by one period can be expressed as: q-1 = -0.807 + 0.496(ESG) + 1.020(ATO) + 0.027(Firm Size) - 0.000(Tangible Assets) + 2.075(Fixed Capital Ratio) + 0.000(Operational Performance) + 1.000(Growth Potential) - 0.181(Cash Flow Efficiency) - 0.000(Revenue Generation) - 0.031(Leverage Ratio, Assets to Liabilities) + 0.000(Total Liabilities) - 0.000(Total Assets).

**Table 4.** Robustness test

| | Non-standardized coefficient | | Standardized coefficient | t | p | covariance diagnosis | |
|---|---|---|---|---|---|---|---|
| | B | standard error | Beta | | | VIF | tolerance level |
| a constant (math.) | -0.807 | 0.180 | - | -4.492 | 0.000** | - | - |
| ESG | 0.496 | 0.010 | 0.259 | 50.607 | 0.000** | 1.273 | 0.785 |
| ATO | 1.020 | 0.032 | 0.171 | 32.192 | 0.000** | 1.371 | 0.730 |
| Company size | 0.027 | 0.008 | 0.027 | 3.485 | 0.001** | 2.961 | 0.338 |
| fixed assets | -0.000 | 0.000 | -0.014 | -0.448 | 0.654 | 5.638 | 0.020 |
| Fixed Assets Ratio | 2.075 | 0.047 | 0.270 | 43.979 | 0.000** | 1.822 | 0.549 |
| operation | 0.000 | 0.000 | 0.000 | 0.012 | 0.990 | 1.987 | 0.091 |
| Corporate Growth | 1.000 | 0.005 | 0.881 | 191.824 | 0.000** | 1.024 | 0.977 |
| Cash flow ratio | -0.181 | 0.150 | -0.006 | -1.209 | 0.227 | 1.333 | 0.750 |
| revenues | -0.000 | 0.000 | -0.006 | -0.572 | 0.568 | 6.070 | 0.165 |
| gearing | -0.031 | 0.001 | -0.110 | -23.445 | 0.000** | 1.075 | 0.930 |
| total liability | 0.000 | 0.000 | 0.079 | 2.514 | 0.012* | 8.066 | 0.021 |
| total assets | -0.000 | 0.000 | -0.071 | -1.460 | 0.145 | 4.183 | 0.009 |
| R 2 | | | | 0.989 | | | |
| Adjustment R 2 | | | | 0.989 | | | |
| individually particular year | | | | containment | | | |
| F | | | | containment | | | |
| D-W value | | | | 3998.224*** | | | |
| | | | | 1.435 | | | |

The ESG possesses a regression coefficient value of 0.496, underscoring a substantial and positive correlation between ESG and Tobin's q-ratio lagged by one period.

## 5 Conclusion

Good ESG performance can increase the corporate value of listed companies. These findings contribute to stakeholder theory. Environmental and social risks follow the

operations of the energy industry. Through systematic ESG disclosure, companies can identify and manage these risks earlier. Through transparent disclosure, enterprises can obtain more feedback and suggestions from stakeholders, which in turn strengthens the cooperative relationship with all parties. Through a high level of ESG disclosure, companies are able to engage more deeply in investment and innovation in areas such as renewable energy, clean technology and resource efficiency. This not only helps companies respond to the global trend of sustainable development, but also enables them to take advantage of future market competition and create long-term value. The energy industry is heavily influenced by policies and regulations. By improving the level of ESG disclosure, companies can better understand and comply with relevant policies and regulations to ensure their compliance.

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