

# An Empirical Analysis of ESG Scores and Firm Performance Based on the CSI 300 Index

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**Abstract.** Environmental, Social, and Governance (ESG) criteria have emerged as pivotal factors in assessing a firm's sustainability and ethical impact. This paper investigates the relationship between ESG disclosure scores and firm performance among Chinese listed companies. Leveraging data from the CSMAR database, the study employs regression analysis to explore the impact of ESG pillars on operating performance (ROA), financial performance (ROCE), and market performance (Tobin's Q). The findings reveal a significant positive correlation between the Social (S) pillar of ESG and firm performance, indicating that investments in social practices such as employee relations and community engagement contribute to stronger financial metrics. Conversely, the relationships with the Environmental (E) and Governance (G) pillars appear less clear, suggesting variability in ESG integration and industry-specific standards. These results underscore the evolving landscape of ESG practices in China and highlight the importance of enhancing ESG disclosures and adopting sustainable business practices in response to shifting market expectations and regulatory emphasis.

**Keywords:** Environmental, Social, and Governance (ESG); Firm Performance; CSI 300 Index.

## 1. Introduction

The increasing globalization of markets and heightened awareness of sustainable practices have prompted a significant shift in how companies are evaluated. Among the most critical frameworks emerging in this context is the Environmental, Social, and Governance (ESG) criteria, which provide a comprehensive method for assessing companies' resilience, sustainability, and ethical impact. This has become particularly pertinent in the case of Chinese listed companies, which are part of one of the world's fastest-growing economies and face unique sustainability challenges and opportunities. The incorporation of ESG criteria into the assessment of firm performance not only aligns with global sustainability trends but also reflects the evolving expectations of investors, regulators, and consumers within and outside China [1, 2].

The rationale behind integrating ESG factors into the analysis of firm performance stems from the hypothesis that sustainable business practices are intrinsically linked to long-term profitability and risk management. Environmental considerations, such as energy usage and waste management, governance practices including board diversity and anti-corruption measures, and social factors, like labor practices and community engagement, are believed to influence a firm's operational efficiency, brand reputation, and ultimately, its financial outcomes.

Recent studies have increasingly focused on quantifying the relationship between ESG practices and firm performance, particularly in the context of Chinese listed companies. While the "Social" pillar, encompassing aspects such as employee treatment, social responsibility, and stakeholder relations, has shown an obvious positive relationship with firm performance in this article, indicating that companies investing in social aspects tend to exhibit stronger financial metrics, the relationships pertaining to the "Environmental" and "Governance" pillars appear less clear [3]. This ambiguity may be attributed to the varying stages of ESG integration and reporting practices among companies, as well as diverse industry standards and regulatory environments in China [4].

This article made a progress in a deeper investigation into how ESG factors, specifically within Chinese listed companies, correlate with firm performance. By focusing on the differentiated impact of the ESG pillars, this study aims to uncover nuanced insights into the strategic importance of ESG criteria in driving corporate success in China's unique market context.

## **2. Literature Review and Hypothesis Development**

### **2.1. Background**

ESG criteria have emerged as pivotal factors in assessing a firm's sustainability and ethical impact. ESG encompasses a broad spectrum of practices: environmental stewardship (e.g., energy use, waste management), social responsibility (e.g., employee relations, community engagement), and governance (e.g., board diversity, executive pay). These criteria are increasingly integrated into the strategic planning of firms to align with global sustainability trends and meet stakeholder expectations. The importance of ESG lies in its potential to influence a firm's risk and return profiles. Companies that score high on ESG criteria are often seen as better risk-managed and more sustainable in the long term. Investors, consumers, and regulatory bodies are increasingly using ESG scores as a measure to gauge a company's resilience to environmental and social challenges, ethical governance, and overall sustainability [1]. This shift reflects a growing recognition that sustainable business practices are not only ethical but can also enhance profitability and shareholder value.

The relationship between ESG practices and firm performance has been a subject of extensive research. Studies have shown that companies with strong ESG practices tend to have better operational performance, are less risky, enjoy lower capital costs, and exhibit higher market valuations [2]. The rationale is that ESG-focused companies are better positioned to navigate environmental and social regulations, attract and retain talent, and foster innovation, all of which contribute to long-term profitability and stability.

### **2.2. ESG in China**

China's rapid economic growth has brought environmental and social challenges to the forefront, prompting both the government and corporations to place greater emphasis on ESG practices. In recent years, regulatory bodies in China have introduced policies to encourage ESG disclosures and sustainable investment. Despite these efforts, the adoption and integration of ESG criteria among Chinese firms vary widely, with significant room for improvement in terms of transparency and reporting standards.

The Chinese market has witnessed a growing emphasis on ESG, driven by regulatory changes, investor demand, and a growing awareness of sustainability issues among the public. The Chinese government's push towards a "green economy" and the inclusion of ESG factors in the evaluation of state-owned enterprises have further highlighted the importance of ESG practices. As a result, there is an increasing trend among Chinese firms to enhance their ESG disclosures and adopt sustainable business practices, aiming to meet both domestic and international expectations [4].

### **2.3. Research Question and Hypothesis Development**

Given the evolving landscape of ESG practices and their perceived impact on firm performance, this study aims to investigate: How do ESG disclosure scores affect the performance of Chinese listed firms in terms of operating performance, financial performance, and market performance?

Research question: How do ESG disclosure scores associated with operating performance among Chinese listed firms?

To test the results in different dimensions, ROA was used to present the firm's operating performance, ROCE was used to indicate the firm's financial performance, and Tobin's Q was used to reveal the firm's market performance to test the robustness.

Return on Assets (ROA) measures the efficiency of a firm's ability to generate profit from its assets. ROA is an important indicator of financial performance, reflecting how well a company utilizes its assets to produce earnings. It is calculated by dividing the firm's net income by its total assets. Some studies also reveal that marketing capabilities directly impact both ROA and perceived firm performance. This means that firms with superior marketing capabilities, such as effective product development, pricing strategies, distribution management, and promotional activities, are able to achieve better financial returns on their assets [5]. ROA is a crucial measure of a company's efficiency

in using its assets to generate earnings. A higher ROA indicates better performance in managing assets to produce profits, which, in turn, contributes to the company's overall profit growth [6].

Return on Capital Employed (ROCE) is considered a comprehensive measure of profitability because it accounts for both the equity and debt in the capital structure, providing a clearer picture of a company's performance than other metrics that consider only equity or specific assets. A higher ROCE indicates that a company is using its capital efficiently to generate profits, while a lower ROCE suggests the opposite. It is calculated by dividing Earnings Before Interest and Tax (EBIT) by the total capital employed (the sum of shareholders' equity and debt liabilities). ROCE assesses how effectively a company uses its capital to generate earnings. This is crucial for understanding the company's operational efficiency and profitability relative to the capital invested [7].

Tobin's Q is a financial measure utilized to evaluate the correlation between a company's market worth and the replacement expense of its assets. The calculation involves dividing the company's market value by the replacement cost of its assets. When Tobin's Q exceeds 1, it implies that the market values the company's assets more than their replacement cost, potentially signaling overvaluation. Conversely, a Tobin's Q below 1 could indicate undervaluation [8].

Hypothesis: There exists a significant positive relationship between ESG disclosure pillar scores and firm performance measures.

- (a) ROA
- (b) ROCE

In order to test the robustness of the regression results, the third measurement is used to perform regression here

- (c) Tobin's Q

### 3. Methodology

China is the second largest economy in the world. Compared with the United States, which is the largest economy, although China has written sustainable development and green economy into its basic national policy, the market's attention to ESG and the academic community's research on it are obviously insufficient. As an increasingly popular term in recent years, ESG has attracted more and more attention from the public. Recently, there have been some papers on ESG research, and China has also established its own marking criteria and databases according to its national conditions.

#### 3.1. Data Selection

In this empirical study, the author examines the influence of ESG disclosure scores on the firm performance of listed companies in China. To assess operational, financial, and market performance, ROA, ROCE, and Tobin's Q ratio are calculated separately. The researcher considers independent variables, ESG pillar disclosure scores, and leverage, corporate age, book-to-market value as control variables. All data was collected from China Stock Market & Accounting Research Database (CSMAR), in which ESG scores were provided by SynTao Green Finance, and evaluated by CSI 300 Index, as shown in Table 1.

**Table 1.** CSMAR's proprietary ESG assessment framework

| Sustainability pillars | Major component                          |                                         |
|------------------------|------------------------------------------|-----------------------------------------|
|                        | Primary indicator                        | Sub-indicator                           |
| Environment (E)        | E1: Environment management               | Greenhouse gas emission                 |
|                        |                                          | Water saving                            |
|                        |                                          | ...                                     |
|                        | E2: Environment disclosure               | Energy consumption                      |
|                        |                                          | discharge amount of wastewater          |
|                        |                                          | ...                                     |
| Social (S)             | E3: Environment negative event           | Negative event of water pollution       |
|                        |                                          | ...                                     |
|                        |                                          | ...                                     |
|                        | S1: Employee                             | Anti-forced labor                       |
|                        |                                          | Occupational health and safety          |
|                        |                                          | ...                                     |
|                        | S2: Supply chain responsibility          | Responsible supply chain management     |
|                        |                                          | ...                                     |
|                        |                                          | ...                                     |
|                        | S3: Customer                             | Confidentiality of customer information |
|                        |                                          | ...                                     |
|                        |                                          | ...                                     |
| Governance (G)         | S4: Community                            | human rights                            |
|                        |                                          | ...                                     |
|                        |                                          | ...                                     |
|                        | S5: Products                             | Fair trade                              |
|                        |                                          | ...                                     |
|                        |                                          | ...                                     |
| Governance (G)         | S6: Company charity                      | Donation                                |
|                        |                                          | ...                                     |
|                        |                                          | ...                                     |
|                        | S7: Negative social events               | Employee negative events                |
|                        |                                          | ...                                     |
|                        |                                          | ...                                     |
| Governance (G)         | G1: Business Ethics                      | Anti-corruption and bribery policies    |
|                        |                                          | Sustainable development commitment      |
|                        |                                          | ...                                     |
|                        | G2: Corporate Governance                 | ESG information disclosure              |
|                        |                                          | Auditing independence                   |
|                        |                                          | ...                                     |
| Governance (G)         | G3: Negative corporate governance events | Negative business ethics events         |
|                        |                                          | Corporate governance negative events    |

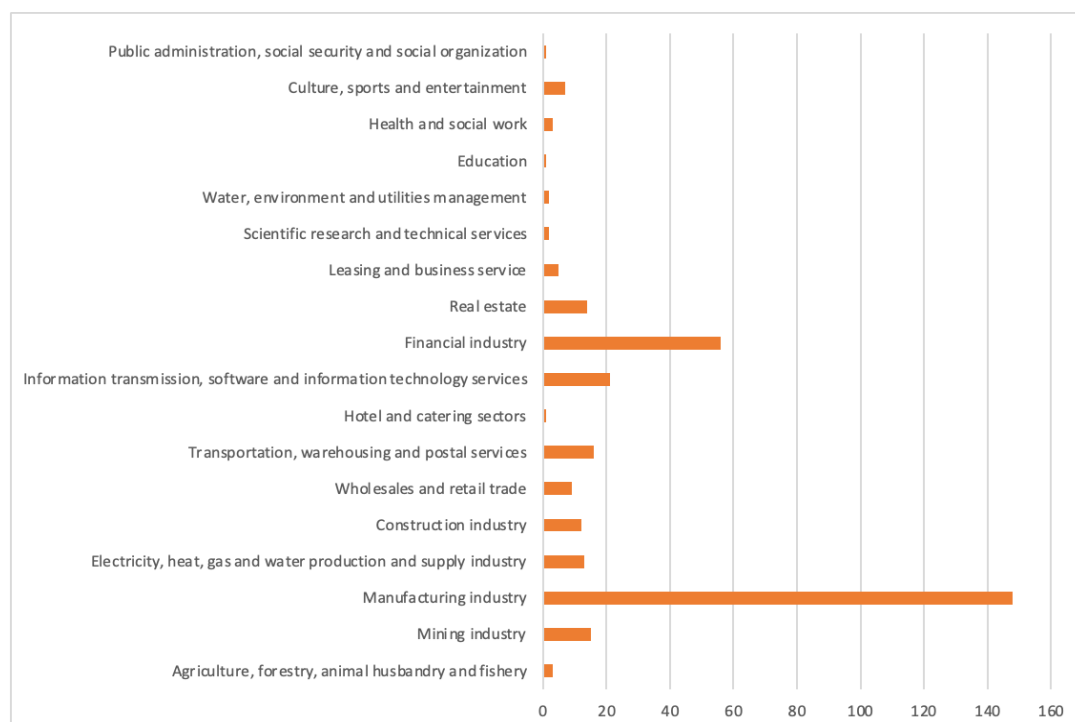


**Fig. 1** Industry composition (Photo/Picture Credit: Original)

The research investigated the ESG disclosure scores of a total of 161 Chinese companies operating within 18 sectors over an eight-year span from 2015 to 2022. At first, all these firms were incorporated into the study; nevertheless, some specific corporate metrics (e.g., instances where a company's book-to-market ratio was absent and whose code number was "000876") were omitted from analysis. Subsequently, the author carefully chose and dropped the missing data, and 114 enterprises were left to form the panel data as reported in Figure 1. Figure 1 shows that the manufacturing industry (45%) constitutes the highest proportion of the total sample followed by the financial industry (17%).

### 3.2. Variable Construction

The variables are constructed as the dependent variables, independent variables and control variables in the Table 2.

**Table 2.** Variable construction.

| Type                  | Variable              | Symbol                    | Description                                                                                                                                  | Reference                                       |
|-----------------------|-----------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Dependent variables   | Operating performance | ROA                       | A financial ratio that measures the profitability of a company relative to its total assets                                                  | Brigham & Ehrhardt [9]; Johnson & Greening [10] |
|                       | Financial performance | ROCE                      | Compares EBIT to the capital employed in the business, measures a company's profitability and the efficiency with which its capital is used. | Brigham & Ehrhardt [9]                          |
|                       | Marketing performance | Tobin's Q (Tobin Q)       | A valuation metric that compares the market value of a company's assets to their replacement cost                                            | Faria et al. [8]; Tobin [11]                    |
| Independent variables | Environment Score     | E_score                   | Environment Score of sample variables                                                                                                        | CSMAR marking criteria                          |
|                       | Social Score          | S_score                   | Social score of sample variables                                                                                                             | CSMAR marking criteria                          |
|                       | Governance Score      | G_score                   | Governance score of social variables                                                                                                         | CSMAR marking criteria                          |
| Control variables     | Book to market value  | BTMV                      | Compare a company's book value to its market value                                                                                           | Fama & French [12]                              |
|                       | Risk of leverage      | DE (Total debt to equity) | Compares the total liabilities of a company to its shareholder equity                                                                        | Brigham & Ehrhardt [9]                          |
|                       | Age of firm           | Age                       | The year of this study minus the year of incorporation of the firm.                                                                          | Kumar & Firoz [13]                              |

### 3.3. Modelling

In this paper, the company performance is studied from two aspects of operating performance, financial performance separately, so two main models are established, following Narula et al. (2024), the models are as follows:

$$ROA = a_0 + b_0 \times E\_score + b_1 \times S\_score + b_2 \times G\_score + b_4 \times BTMV + b_5 \times DE + b_6 \times age + e \quad (1)$$

$$ROCE = a_0 + b_0 \times E\_score + b_1 \times S\_score + b_2 \times G\_score + b_4 \times BTMV + b_5 \times DE + b_6 \times age + e \quad (2)$$

Where the dependent variables are ROA, the return on assets; ROCE, the return on capital employed. The independent variables are E\_score, environment score; S\_score, social score; G\_score, governance score. BTMV, DE and Age are the control variables referring to the book to market value, the debt to equity, and the age of the firm. The error term is e.

### 3.4. Robustness Check

By following Narula et al. (2024), the robustness test model is as follows [14].

$$TobinQ = a_0 + b_0 \times E\_score + b_1 \times S\_score + b_2 \times G\_score + b_4 \times BTMV + b_5 \times DE + b_6 \times age + e \quad (3)$$

Where the dependent variable is TobinQ, Tobin's Q. The independent variables are E\_score, environment score; S\_score, social score; G\_score, governance score. BTMV, DE and Age are the control variables referring to the book to market value, the debt to equity, and the age of the firm. The error term is e.

## 4. Empirical Results

### 4.1. Descriptive Statistics

The preliminary analysis of dependent and independent variables is shown in Table 3. It provides descriptive statistics for 114 Chinese firms in this study. The E and S scores have mean values of 33.36 and 32.39, respectively, while the G score has a noticeably lower mean of 28.45. A lower G score in comparison to E and S scores could indicate that the governance practices or transparency levels of these companies may be less developed or emphasized than environmental and social factors. Of the total ESG disclosure scores, the lowest score is 7.5 (G score) and the highest score is 89.45 (E score), the standard deviation of the scores for all three pillars is around 20, and the disclosure scores of the sample enterprises are highly discrete, indicating that only a few companies provide reasonable ESG disclosure information. These results indicate that ESG disclosure in China is still in its infancy. The mean Debt-to-Equity ratio is 0.62, which signifies moderate leverage; firms finance more of their operations through equity rather than debt. The average age of the companies is about 20.57 years, indicating a sample possibly consisting of relatively established firms. The Book-to-Market Value ratio, with an average of 4.88, suggesting the firms' book values are relatively high compared to their market values, which could indicate that the stocks might be undervalued or the companies are asset-heavy. A skewness of 0.72 for the G score suggests a slight asymmetry skewed to the right, indicating a few firms might have exceptionally high governance scores.

**Table 3.** Descriptive statistics

| Variables | Obs. | Mean  | Min   | p25   | median | p75   | Max   | S.D.  | Skewness |
|-----------|------|-------|-------|-------|--------|-------|-------|-------|----------|
| ROA       | 912  | 0.05  | -0.15 | 0.01  | 0.03   | 0.08  | 0.26  | 0.06  | 1.12     |
| ROCE      | 912  | 0.11  | -2.10 | 0.07  | 0.11   | 0.16  | 0.58  | 0.12  | -8.27    |
| TobinQ    | 912  | 1.39  | 0.02  | 0.21  | 0.49   | 1.63  | 19.86 | 2.17  | 3.19     |
| E_score   | 912  | 33.36 | 9.63  | 17.13 | 20.88  | 53.32 | 89.45 | 20.59 | 0.75     |
| S_score   | 912  | 32.39 | 8.25  | 17.00 | 19.38  | 53.77 | 79.10 | 19.88 | 0.68     |
| G_score   | 912  | 28.45 | 7.50  | 12.88 | 15.94  | 48.21 | 78.27 | 19.90 | 0.72     |
| BTMV      | 912  | 4.88  | 0.05  | 0.61  | 2.06   | 4.71  | 48.04 | 7.48  | 2.59     |
| DE        | 912  | 0.62  | 0.01  | 0.45  | 0.64   | 0.78  | 0.94  | 0.22  | -0.40    |
| age       | 912  | 20.57 | 6     | 16    | 21     | 25    | 39    | 6.41  | 0.12     |

As for the dependent variables, the average ROA is 5%, and the average ROCE is 11%. Both these indicators reflect firm profitability, with ROCE including long-term financing in its calculation, which can give a more comprehensive view of profitability. The minimum value of ROA is -0.15 and the minimum value of ROCE is -2.10, indicating that some companies in the sample are facing a loss or worse financial situation. As for the standard deviation ROA is 0.06, the volatility is greater, and the ROCE is 0.12, the volatility is greater than the ROA, which may be due to the different capital utilization efficiency caused by different industries or company sizes. As for the robustness indicator Tobin Q, the mean is 1.39 and the median is 0.49, meaning that the market value of most companies is less than the replacement cost of their assets. With a standard deviation of 2.17, Tobin Q is extremely volatile, likely reflecting the diversity of market expectations for the company's outlook. In addition, Table 4 details the relationship between the dependent variables (ROA, ROCE, and TOBIN Q) and the independent variables (ESG score, risk, BMTV, company age). This association indicates a statistically significant result, the magnitude of which is further illustrated in the regression model.

**Table 4.** Correlation matrix

|           | ROA     | ROCE    | Tobin's Q | E_score | S_score | G_score | BTMV   | DE     | age |
|-----------|---------|---------|-----------|---------|---------|---------|--------|--------|-----|
| ROA       | 1       |         |           |         |         |         |        |        |     |
| ROCE      | 0.6697  | 1       |           |         |         |         |        |        |     |
| Tobin's Q | 0.6488  | 0.2753  | 1         |         |         |         |        |        |     |
| E_score   | -0.0616 | -0.1223 | 0.0041    | 1       |         |         |        |        |     |
| S_score   | -0.0486 | -0.1039 | 0.0126    | 0.9587  | 1       |         |        |        |     |
| G_score   | -0.0891 | -0.1334 | -0.0417   | 0.9421  | 0.9464  | 1       |        |        |     |
| BTMV      | -0.3872 | -0.0682 | -0.357    | 0.1403  | 0.1165  | 0.1926  | 1      |        |     |
| DE        | -0.6923 | -0.2057 | -0.629    | 0.0393  | 0.0434  | 0.0838  | 0.6303 | 1      |     |
| age       | -0.1461 | -0.0247 | -0.115    | 0.3214  | 0.3046  | 0.325   | 0.3428 | 0.2225 | 1   |

Overall, while E and S aspects are more emphasized, as reflected in their higher average scores, the focus on governance (G score) appears to be slightly lagging. This could be an area for improvement for these firms, reflecting a possible trend or area of focus for investors, regulators, or company management to address.

## 4.2. Regression Results

Before performing regression analysis, the authors examined multicollinearity and autocorrelation between the independent variables. The variance inflation factor VIF was used for each equation to test collinearity. Since all VIFs are less than 10, there is no problem with multicollinearity. The autocorrelation was tested by Durbin-Waston, and the DW value of all data was close to 2, and there was no autocorrelation in the residual. So there are no serious problems in the data set.

**Table 5.** Impact of ESG pillar disclosure score on ROA

| ROA      | Coefficient | Robust Std. err. | t         | P> t  | 95% confidence interval |        |
|----------|-------------|------------------|-----------|-------|-------------------------|--------|
| E_score  | -0.001      | 0.000            | -1.420    | 0.158 | -0.001                  | 0.000  |
| S_score  | 0.001       | 0.000            | 2.470     | 0.015 | 0.000                   | 0.001  |
| G_score  | 0.000       | 0.000            | -1.020    | 0.310 | -0.001                  | 0.000  |
| BTMV     | 0.001       | 0.000            | 2.650     | 0.009 | 0.000                   | 0.001  |
| DE       | -0.187      | 0.021            | -8.720    | 0.000 | -0.229                  | -0.144 |
| age      | 0.000       | 0.000            | 0.080     | 0.932 | -0.001                  | 0.001  |
| constant | 0.162       | 0.013            | 12.500    | 0.000 | 0.136                   | 0.187  |
| Obs.     | 114         |                  | R-squared |       | 0.490                   |        |

**Table 6.** Impact of ESG pillar disclosure score on ROCE

| ROCE     | Coefficient | Robust Std. err. | t         | P> t  | 95% confidence interval |        |
|----------|-------------|------------------|-----------|-------|-------------------------|--------|
| E_score  | -0.001      | 0.001            | -1.480    | 0.142 | -0.003                  | 0.000  |
| S_score  | 0.002       | 0.001            | 2.150     | 0.033 | 0.000                   | 0.004  |
| G_score  | -0.002      | 0.001            | -1.970    | 0.052 | -0.003                  | 0.000  |
| BTMV     | 0.002       | 0.001            | 1.690     | 0.095 | 0.000                   | 0.005  |
| DE       | -0.159      | 0.055            | -2.910    | 0.004 | -0.268                  | -0.051 |
| age      | 0.001       | 0.001            | 0.780     | 0.437 | -0.001                  | 0.003  |
| constant | 0.204       | 0.033            | 6.120     | 0.000 | 0.138                   | 0.270  |
| Obs.     | 114         |                  | R-squared |       | 0.076                   |        |

Tables 5 and Table 6 (keep 3 decimal place) report the results of ordinary least squares (OLS). They describe the impact of ESG disclosure pillar scores on firm performance (ROA and ROCE), respectively. The F statistics of the two models are 33.08 and 2.71 respectively, and the P values are 0 and 0.0169 respectively, indicating that the explanatory variables of the models are statistically significant for the observed dependent variables on the whole, and the models are valid. The coefficient of determination  $R^2$  is 0.4899 and 0.076 respectively, which means that the explanatory

variables of the model can explain about 48.99% of the changes in ROA, which is a medium-level fit index. For ROCE, all independent variables together explain 7.6% of the total variability of ROCE, and the explanatory ability is limited. Next, the ROA model will be analyzed in detail.

According to the data in Table 5, the impact of each pillar's score on company performance is uneven. Among the three pillar scores, E score and G score were not statistically significant ( $P > 0.05$ ), there is no clear relationship between these two scores and ROA. The coefficient of S score is about 0.001, which is significant ( $P = 0.015$ ), indicating that every increase of S score by 1 increases ROA by about 0.001 on average, and social responsibility performance has a positive impact on the company's ROA during this period. This means that in China, the company's social practice is more likely to have a good impact on the company's performance. Although these results differ slightly from other studies, there are realistic reasons for this. Ruan & Liu ended in 2019, and according to the statistical rules of CSMAR, ESG scores were scored in December 2019, and COVID-19 emerged in late 2019, with a major outbreak in 2020 [15]. This has had a huge impact on the Chinese market. The Chinese government adopted mandatory quarantine measures in 2020 to curb the spread of the epidemic, and officially issued a notice to lift the quarantine in early 2023. In this nearly three years period, only several companies in special industries with special licenses can have personnel circulation, and employees cannot go to the company, which is a serious blow to the manufacturing industry, which accounts for the largest proportion of the sample, and the company's poor performance is understandable. The study covered all data from 2015 to 2023, while Ruan & Liu stopped at the end of 2019, excluding the pandemic period [15].

During the epidemic, many companies have carried out social activities like donating materials. In order to maintain people's confidence in overcoming the epidemic, these social activities are widely spread, and people have confidence in these companies. After the gradual removal of segregation, these social activities also brought more profits to the firm, which also explains the positive correlation between S scores and firm performance.

### 4.3. Robustness Check

In order to verify the robustness, the least squares regression is also carried out on Tobin Q, an indicator of corporate performance, and the results are shown in Table 7.

**Table 7.** Impact of ESG pillar disclosure score on Tobin's Q

| Tobin's Q | Coefficient | Robust Std. err. | t         | P> t  | 95% confidence interval |           |
|-----------|-------------|------------------|-----------|-------|-------------------------|-----------|
| E_score   | -0.0023013  | 0.0125917        | -0.18     | 0.855 | -0.0272476              | 0.0226451 |
| S_score   | 0.0367793   | 0.0183205        | 2.01      | 0.047 | 0.0004831               | 0.0730755 |
| G_score   | -0.0330201  | 0.0169957        | -1.94     | 0.055 | -0.0666917              | 0.0006514 |
| BTMV      | 0.0254228   | 0.0131946        | 1.93      | 0.057 | -0.0007181              | 0.0515638 |
| DE        | -6.568548   | 0.9771232        | -6.72     | 0     | -8.504405               | -4.632691 |
| age       | 0.0026534   | 0.0191736        | 0.14      | 0.89  | -0.0353331              | 0.0406398 |
| Obs.      | 114         |                  | R-squared |       | 0.4088                  |           |

The model's F-statistic is 24.69, which is statistically significant ( $\text{Prob} > F = 0.000$ ), suggesting that the explanatory variables, as a whole, have a significant linear relationship with Tobin's Q. The  $R^2$  value of 0.4088 indicates that approximately 40.88% of the variance in Tobin's Q is explained by the model. This is a moderate level of explanatory power. Similar with the model of ROA, Table 7 report the same relationship, S score has a coefficient of 0.0367393, with a p-value of 0.047, which is just at the conventional 5% significance level. This implies a positive relationship between the social score and Tobin Q, which means the model has robustness, the results are reliable.

## 5. Conclusion

This study critically examines the relationship between ESG disclosure scores and firm performance in the context of Chinese listed companies, delving into the nuances of how each ESG

pillar—Environment, Social, and Governance — influences various aspects of firm performance. The study leverages comprehensive data from CSMAR and applies rigorous empirical methodologies to assess the impact of ESG disclosures on operating performance (ROA), financial performance (ROCE), and market performance (Tobin's Q).

The research findings underscore the significance of the Social (S) pillar of ESG, which exhibits a clear and positive correlation with firm performance across different metrics. This aligns with prior studies suggesting that investments in social practices, including employee relations and community engagement, can yield tangible benefits for companies (Wang et al., 2016). Conversely, the relationships between the Environmental (E) and Governance (G) pillars and firm performance appear less definitive, suggesting variability in the stages of ESG integration and the influence of industry-specific standards and regulatory frameworks in China (Cheung et al., 2010).

The evolving landscape of ESG practices in China, marked by increased regulatory emphasis and shifting market expectations, provides a dynamic backdrop for this study. The government's initiatives towards a "green economy" and the inclusion of ESG factors in evaluating state-owned enterprises are pivotal steps that reflect a broader global trend towards sustainability (Cheung et al., 2010). This shifting paradigm underscores the need for Chinese firms to enhance their ESG disclosures and adopt more robust and transparent sustainable business practices. The first ESG summit will be held in China in 2024, and long-term observation and research on ESG in China is imperative in the future.

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