# The Impact of Corporate Social Responsibility on Corporate Performance - Evidence From Listed Companies in the Sports Industry in China

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**Abstract**

Maximizing profits has always been the goal and principle pursued in a company's development. Based on this so-called business principle, companies often blindly pursue economic interests, leaving behind environmental protection and even labor rights and consumer interests, which cause many negative externalities. With the continuous development of the society and the economy, the society no longer evaluates the corporate performance of a company based on its financial performance alone. The society now expects a company not only to improve its financial performance, but also fulfill its social responsibility obligations. However, a large number of companies in China do not put their social responsibility in place. The expenditures on environmental governance, the rights of employees and small/medium investors, along with the intensity of public charity donations, are still unqualified. While the society strongly encourages companies to fulfill their social responsibility, some other parties believe that fulfilling corporate social responsibility increases the cost of a company, which consequently has a negative impact on the financial performance of the company. As a result, whether there is a need for companies to fulfill social responsibility, whether the economic benefits and corporate social responsibility are mutually antagonistic, and how companies should balance their own operations, management and fulfillment of social responsibility, need to be further studied.

As an important part of the H-industry, the sports industry has a positive effect on optimizing the industrial structure, expanding domestic demand, and promoting employment. It has developed into a new long-term point in promoting urban economic development. However, at present, there has been little research on the capital management of listed companies in the sports industry. Therefore, based on the Chinese market environment, this paper listed investigates companies in the sports industry. It attempts to find out how the implementation of corporate social responsibility in the Chinese sports industry impacts the corporate performance. This paper uses panel data of 16 listed companies in the sports industry between 2009 and 2016, and rules out the possibility of spurious regression through a series of preliminary tests. Panel correction error model, asymptotic fixed effect model, super-efficiency DEA-Tobit model and threshold panel model are utilized to analyze the influence of fulfilling corporate social responsibility (CSR) on the corporate performance of listed companies in the sports industry in China.

**Keywords**: listed companies in the sports industry, corporate social responsibility, panel data, super-efficiency DEA, Tobit model

## 1. Introduction

For a long time, the development of companies has followed the principle of maximizing profits. With the rapid development of China's economy, the short-term behavior of companies has led to many adverse consequences, which have seriously hindered the sustainable development of China's economy and companies——the environment has gradually deteriorated, corporate credit has decreased, and social conflicts have proliferated. As a result, all sectors of society have begun to attach importance to corporate social responsibility. Up to now, the mainstream concept comes from Social Accountability International (SIA): "There is a big difference between corporate social responsibility and business responsibility." Corporate social responsibility means that the company is responsible to

all entities in society. The responsibilities include: protection of the environment, protection of vulnerable groups, compliance with business ethics, charity, and protection of labor rights *etc*.

However, Chinese companies still do not fully fulfill their social responsibilities. For example, the current lack of attention in workers' rights and interests in production and operation, the rights and interests of small and medium-sized investors are still undermined. Besides, there are generally lower environmental governance expenditures, as well as lower public welfare and charitable contributions. Zhou (2008) argued that in essence, a company is only an economic organization, and improving corporate financial performance is the main goal of any company. How do companies seek a balanced development among business operations, corporate governance, and social responsibility? Is there a significant impact of corporate social responsibility on corporate performance? Should the company assume social responsibility? The answers to these questions are closely related to the specific environment of the market, so the relationship between social responsibility and corporate performance must be studied based on national historical data.

As a very important part of the H industry, the sports industry has played an important role in promoting the rapid and healthy development of the urban economy. At present, the sports industry has become an indispensable part of people's life, and its development is closely related to the globalization process. In the sports industry, the fulfillment of social responsibility of enterprises is no longer just a kind of commercial behavior, but it has gradually become an effective way to cultivate the core competitiveness of companies, and it is receiving more and more attention from all walks of life. However, as a very socially influential industry, research on it is scanty. There is very limited research on corporate social responsibility and corporate performance of China's sports industry. Because there is a big difference in the relationship between corporate social responsibility and corporate performance among different industries, and listed companies in the sports industry are the leading enterprises in the entire sports industry. This paper contributes to the existing literature on the relationship between corporate social responsibility and corporate performance, which can promote the continued expansion and promote the healthy and rapid development of companies in the sports industry.

Studying the social responsibility of the sports industry can greatly promote the companies in the sports industry to clarify the corporate social responsibility that should be undertaken, and to a large extent improve the awareness of listed companies in the sports industry in fulfilling their social responsibilities, thereby enhancing their competitiveness and helping listed companies in the sports industry to further clarify their development direction. It can also improve the performance of the company while taking into account the social image, so as to achieve the dual purpose of improving corporate performance and fulfilling social responsibility.

The remaining part of this paper is organized as follows. Section 2 reviews related literature. Section 3 introduces the data. Section 4 presents the empirical analysis. Section 5 concludes the paper and proposes policy implications.

## 2. Related Literature

A great deal of literature pertains to the impact of corporate social responsibility for corporate performance. Only a partial selection of literature is briefly discussed here. Regarding measurement and definition of corporate performance, Yang (1987) believes that for the corporate performance of Sino-foreign joint ventures, profitability, liquidity, safety and other five aspects play a vital role, so evaluating a Sino-foreign joint ventures' performance must start from these five aspects. Wang and Song (1999) established an index system for evaluating the corporate performance of high-tech industries from the two levels of input and output. Yang and Li (2001) analyzed the problems encountered in the process of evaluating corporate performance in China, and used the American EVA evaluation index theory as the theoretical basis, and conducted in-depth research and analysis on its content. Jia, Chen, and Tian (2003) argued that corporate performance is closely related to stakeholders. Therefore, research on corporate performance must be based on stakeholder theory and real-life cases. Chen, Lai, Chen (2005) used the DEA method to evaluate and analyze corporate performance. Liu (2013) combined the analytic hierarchy process (AHP) method with the DEA method to evaluate the corporate performance of the company. It has made significant progress compared to the DEA method alone.

Corporate social responsibility (CSR) refers to a company's responsibility for the various entities with their relevant interests. The concept of corporate social responsibility is an extension of the concept of sustainable business development. It requires companies to pay attention to their own development on the one hand, and on the other hand, whether their behavior will have some negative impact on other related entities. Sheldon (1924) is the first to propose corporate social responsibility. He believes that companies should not regard profitability as the sole goal in their operation. Instead, they should be intrinsic to ensure the interests of stakeholders. Bowen (1952) argues that corporate social responsibility means that in the process of conducting business conduct, merchants must take into

account the interests of stakeholders such as society and employees to maximize the realization of their interests. Friedman (1962) opposed corporate social responsibility. He believes that the social responsibility that companies must perform refers to the behavior of companies to revitalize their own resources to maximize profits without violating relevant regulations. Epstein (1987) argues that corporate social responsibility means that decisions made by companies on specific issues must not harm the interests of stakeholders and should be as helpful as possible to the interests of stakeholders. In China, Wang (2011) studied the lag effect of the behavior of companies in the process of fulfilling their social responsibilities, and found that there are two reasons for this phenomenon: internal and external. The internal reason is that companies are not aware of the importance of fulfilling their social responsibilities. The external reason is that the whole society has not formed a good atmosphere for actively fulfilling social responsibilities. Therefore, both the company itself and the social environment should make changes and form a good circular mechanism for fulfilling social responsibilities. Li (2012) conducted in-depth research on the feasibility of fulfilling social responsibility and found that in order to make the implementation of corporate social responsibility more active and healthy, companies should pay attention to three aspects: clear standards, establish and improve internal governance, and create excellent corporate culture. Tian and Jiang (2014) investigated the factors that promote corporate social responsibility, and found that the pressure brought by stakeholders and institutions can greatly promote enterprises to fulfill corporate social responsibility. In the research of corporate social responsibility evaluation system, Ma and Xu (1995) combined the AHP with the principle of linear interpolation to evaluate the fulfillment of corporate social responsibility. On the basis of traditional Chinese values cultural of SA8000 standards, Li (2007) used the comprehensive fuzzy evaluation method to establish an index system for evaluating the implementation of corporate social responsibility, and conducted empirical analysis based on relevant data of Hunan Province. Based on the pyramid model proposed by Carroll (1991), Cai (2011) established a new model that evaluates the fulfillment of corporate social responsibility. Based on the theory of stakeholders, Liu and Sun (2013) used the AHP to establish a model for evaluating the performance of corporate social responsibility. The model mainly includes shareholders, government, consumers, employees and many other aspects.

Research on corporate social responsibility and corporate performance is mainly divided into three categories. The first category is considered that CSR has a positive impact on corporate performance. Wen, Fang (2008) collected data of 46 listed companies of 5 years, and established a measurement model to study the relationship between fulfillment of corporate social responsibility and corporate performance. The empirical results show that corporate social responsibility can promote corporate performance. Chen (2012) collected data of 1,198 listed companies of 4 years, and analyzed the relationship between fulfillment of corporate social responsibility and corporate performance. The final result shows that the higher the degree of corporate social responsibility, the better the company's performance. Li and Chen (2014) used factor analysis to analyze the data of 686 listed companies, and found that corporate social responsibility and corporate performance are positively related, *i.e.*, corporate performance continues to increase as the degree of corporate social responsibility deepens. The second category is considered that CSR has a negative impact on corporate performance. Li (2003) conducted an empirical study using the data of 521 listed companies in 2003 in the process of studying the relationship between fulfillment of corporate social responsibility and corporate performance. The final result shows that fulfillment of corporate social responsibility is negatively correlated with corporate performance, *i.e.*, corporate performance is reduced as the degree of corporate social responsibility is extended. Zhu and Yang (2009) studied the relationship between the degree of corporate social responsibility of Shanghai stock companies and corporate performance and found that corporate performance continues to decrease as companies fulfill their social responsibility for many stakeholders. The third category believes that there is no correlation between the two. Chen and Ma (2005) utilized companies listed in Shanghai stock exchanges was a sample, *i.e.*, there is no significant correlation between social responsibility and corporate performance.

Chen, Yin and Xia (2008) established a new indicator system to measure the performance index of China's sporting goods manufacturing companies, and collected data from the three regions of China, eastern, central and western, and evaluated the performance of sporting goods enterprises in these three regions. Ren (2010) took Nike as an example. Under the general trend of economic globalization, from the two dimensions of government and enterprise, it analyzes the driving force of listed companies in the sports industry to fulfill corporate social responsibility, and based on this, puts forward suggestions on the promotion of sports goods enterprises in China. Lu (2013) collected historical data of five listed companies in the sports industry from 2009 to 2011, selected six indicators that can evaluate the performance of corporate social responsibility, and the return on the assets index to measure the performance of enterprises. Regression results show that corporate social responsibility could not have a substantial impact on corporate performance, but it played a positive role in promoting other stakeholders.

Previous literature has corporate social responsibility and corporate performance research. However, in the sports industry, there is very little research on the social responsibility and enterprise performance of sports companies. Most of the research utilizes qualitative analysis, but lacks quantitative analysis, and technicality in evaluating the index of corporate performance of listed companies in the sports industry. Based on the existing research, this paper further expands the sample capacity of the research, selects indicators that can reflect the corporate social responsibility and enterprise performance, and quantifies these indicators to further study whether the performance of corporate social responsibility of listed companies in sports will have a substantial impact on corporate performance, so as to promote listed companies in the sports industry to better fulfill corporate social responsibility while improving corporate performance.

## 3. The Data

Listed companies in the sports industry refer to listed companies that mainly engage in sports business. According to statistics, there were 21 listed companies in the sports industry in China at the end of 2016. This paper selects companies with mature and stable business, and eliminates 5 samples according to the following criteria. First, exclude the sample with incomplete disclosure of social responsibility information. Second, exclude samples that cannot be descriptively analyzed due to incomplete information disclosure or missing important information in certain years. At the end of this paper, the data of 16 listed companies in the sports industry were selected as samples.

The descriptive statistics of variables are as follows:

Table 1. Descriptive Statistics

| Variable | Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| EPS | 2016 | 0.291 285 9 | 0.523 236 8 | -3.2389 | 4.42 |
| ROA | 2016 | 5.565 512 | 7.709 529 | -97.5715 | 115.2224 |
| ROE | 2016 | 8.099 509 | 77.453 49 | -264.2691 | 3383.131 |
| INS | 2016 | 20.101 23 | 19.713 33 | 0 | 88.2359 |
| SIZE | 2016 | 9.534 678 | 0.562 883 4 | 7.89 | 11.71 |
| GROWTH | 2016 | 45.314 39 | 883.2986 | -97.7688 | 36 753.2 |
| LEV | 2016 | 51.740 77 | 19.081 59 | 1.233 373 | 105.7057 |
| TURN | 2016 | 0.784 316 3 | 0.709 069 6 | 0.0007 | 8.5009 |
| TOP1 | 2016 | 33.991 82 | 15.528 15 | 3.621 09 | 84.920 11 |
| TOP1SQ | 2016 | 1 396.448 | 1240.301 | 13.112 29 | 7211.426 |
| RTS | 2016 | 99.502 89 | 5.042 602 | 26.560 42 | 100 |
| SCORE | 2016 | 36.836 43 | 12.775 73 | 15.2 | 87.95 |

Then the paper makes a descriptive analysis of the performance income and structure, listing and issuance status and capital structure of China's listed companies in the sports industry:

First, the overall earnings per share (EPS) of China's listed companies in the sports industry are relatively good, and some listed companies in the sports industry are in a state of loss. The distribution of EPS in the China's sports industry is relatively concentrated. From the perspective of company scale, listed companies in China's sports industry have a common phenomenon of small number and small scale. In addition, the proportion of China's listed companies in the sports industry is still far behind that of the United States and other countries with more developed sports industries. The gap in the development of the company is very large, and there may be a large gap in the future scale.

Second, compared with the beginning of the listed companies in the sports industry, the market value of all listed companies in the sports industry has been greatly improved. Especially during the 2008 Olympic Games in Beijing, the number of listed companies reached its peak. The share capital of each listed company has been doubled by the capital expansion of the securities market, and the development trend is strong.

Third, investors are more convinced of the investment value and development potential of listed companies in mainland China. Nearly half of the companies' liquidity is not adequately structured, and the liquidity of liquid assets in the sports industry needs to be improved. At present, the degree of development of companies in the sports

industry is different, and the overall trend has not been formed, but the development of most companies is still good. All companies have a healthy asset-liability ratio, and companies with strong debt-paying ability can use the company's funds very effectively with financial leverage.

**4. China's Corporate Social Responsibility Assessment System and Tools**

The premise for quantifying corporate social responsibility management is to choose appropriate measurement indicators. According to Li (2006), the corporate social responsibility assessment system adopted in this paper mainly includes five major factors: labor rights, human rights protection, social responsibility management, business ethics and social welfare behavior. The evaluation system contains the main content of the international SA8000 indicator. Among them, the first two types of evaluation factors can be subdivided into four sub-factors; the latter three types of evaluation factors are also called other self-factors. These 13 sub-factors contain 38 third-level indicators, which can be divided into two categories. One is the indicator that can be quantitatively analyzed, and the other is the qualitative analysis indicator.

This paper uses corporate social responsibility to perform comprehensive scores to represent the quality of its performance, thus studying how the degree of compliance of corporate social responsibility affects corporate performance.

**5. Empirical Analysis**

At present, the society has given more and more attention to the fulfillment of social responsibility by companies. Under this background, companies pay more attention to the fulfillment of social responsibilities and will issue social responsibility reports in a timely manner. Despite close attention to the correlation between corporate social responsibility and corporate performance, yet there is no unified conclusion on the impact and effect between the two. There are currently three results of "positive correlation", "negative correlation" and "unrelated". In addition, there is very little research on the sports industry, and it is even more difficult to draw conclusions based on previous research results. Therefore, it is imperative to test the impact on the financial performance of the companies in China's sports industry through empirical analysis. Because the results of supporting positive correlations are more than negative correlations, the paper makes the following assumptions:

Hypothesis H: The performance of social responsibility by listed companies in the sports industry can promote corporate performance.

This paper selects earnings per share (EPS) and return on assets (ROA) as explanatory variables:

EPS is a company's after-tax profit that can be shared for each common share, calculated as:

$$\text{EPS} = \frac{profit\ attributable\ to\ ordinary\ share\ holders}{weighted\ average\ number\ of\ ordinary\ share\ outstanding} \quad (1)$$

The profit attributable to ordinary shareholders is the difference between net profit and preferred stock dividend.

Return on assets (ROA) refers to the ratio of the total after-tax income of a company to the total assets of a company, calculated as:

$$\text{ROA} = \frac{net\ profit}{average\ total\ assets} * 100\% \quad (2)$$

This paper selects the social responsibility rating score (SCORE) as the main explanatory variable. This variable is based on the CSR evaluation method described in section 4. The higher the rating score, the better the social responsibility of the company is performing. The corporate performance of a listed company in the sports industry is mainly represented by EPS or ROA. This paper tests whether the fulfillment of corporate social responsibility has a positive or negative impact on financial performance.

When constructing a regression model, this paper introduces the following control variables and controls their impact on the relationship between social responsibility and corporate performance: institutional investor share (INS), company size (SIZE), growth (GROWTH), asset-liability ratio (LEV), turnover rate (TURN), blockholder ratio (TOP1) and marginal substitution rate (RTS).

The data used in this paper are gathered from the financial reports and corporate social responsibility reports of listed companies, and some financial data are gathered from the CSMAR database. The data span used in this paper is 2009-2016. In the regression analysis, complete data of 8 years for all companies is required. This requires that the amount of information is large enough to calculate the value of each variable. Therefore, the initial sample is screened and 16 effective samples are obtained.

This paper establishes the following model to verify the hypothesis:

First, select EPS and ROA as independent variables and test whether corporate social responsibility has an impact on corporate performance.

$$\text{EPS} = \alpha + \beta_1 SCORE + \beta_2 INS + \beta_3 SIZE + \beta_4 GROWTH + \beta_5 LEV + \beta_6 TURN + \beta_7 TOP1 + \beta_8 TOP1SQ + \beta_9 RTS + \varepsilon \quad (3)$$

$$\text{ROA} = \alpha + \beta_1 SCORE + \beta_2 INS + \beta_3 SIZE + \beta_4 GROWTH + \beta_5 LEV + \beta_6 TURN + \beta_7 TOP1 + \beta_8 TOP1SQ + \beta_9 RTS + \varepsilon \quad (4)$$

In order to test whether there is a phenomenon that the performance of social responsibility is different due to the different levels of financial performance of the company, this paper constructs a model similar to (3) and selects the return on equity (ROE) as an independent variable to test whether there is a threshold effect.

$$\text{EPS} = \alpha + \beta_1 * I * ROE(ROE \le \gamma_1) + \beta_2 * I * ROE(\gamma_1 \le ROE \le \gamma_2) + \beta_3 * I * ROE(ROE \ge \gamma_2) + \beta_4 SCORE + \beta_5 INS + \beta_6 SIZE + \beta_7 GROWTH + \beta_8 LEV + \beta_9 TURN + \beta_{10} TOP1 + \beta_{11} TOP1SQ + \beta_{12} RTS + \varepsilon \quad (5)$$

This paper firstly verifies the impact of social responsibility for the performance of listed companies in the sports industry based on panel data.

The data used in this paper are short panel data. In order to avoid the phenomenon of spurious-regression, this paper conducts a unit root test on the EPS variable. The test results show that there is no unit root and EPS variable is stable.

This paper uses the same method to conduct a unit root test on social responsibility rating (SCORE), institutional investor ratio (INS), company size (SIZE), growth (GROWTH), asset-liability ratio (LEV), turnover rate (TURN), blockholder ratio (TOP1) and marginal substitution rate (RTS). The test results show that these variables all appear to have no unit roots. Therefore, this paper does not need to do cointegration test for non-stationary economic variables.

For the comparison and selection of models, models that can be selected mainly include three methods: ordinary least squares (OLS), random model and fixed-effect model.

First, this paper compares the random effect regression results with the ordinary least squares regression results. Breusch-Pagan test finds that the random model is better than OLS.

Then the effects of fixed-effect model and random model are compared. The Hausman test shows that the fixed-effect model is better than the random model. Finally, the fixed-effect model is selected for regression analysis.

For cross-sectional correlation testing, this paper uses Friedman and Frees methods to test the cross-section dependency. The Friedman cross-section correlation test and the Frees cross-section correlation test results both show that there is no cross-sectional dependency in the panel data.

For endogenous test, this paper utilizes the Davidson-MacKinnon method to test whether the panel data have endogeneity problems. This paper constructs a panel instrument variable regression model with 2 periods lagged variables as instrumental variables. The test results show that there is no endogeneity problem in the panel data.

This paper uses the same method to conduct a test on social responsibility rating (SCORE), institutional investor ratio (INS), company size (SIZE), growth (GROWTH), asset-liability ratio (LEV), turnover rate (TURN), blockholder ratio (TOP1) and marginal substitution rate (RTS). The results show that there is no endogeneity in these data.

For heteroskedasticity testing, this paper uses Wald method. The final result shows that the heteroskedasticity of the panel data collected in this paper is very significant. Therefore, this paper controls heteroskedasticity in the process of constructing the model for regression.

In general, it can be seen from the preliminary tests that the fixed effect model is better than both the random effect model and the ordinary least squares. At the same time, because the data does not have cross-section dependency and endogenous problems, this paper chooses the fixed effect model that controls the heteroskedasticity.

Regression on EPS is as follows:

$$\text{EPS} = \alpha + \beta_1 SCORE + \beta_2 INS + \beta_3 SIZE + \beta_4 GROWTH + \beta_5 LEV + \beta_6 TURN + \beta_7 TOP1 + \beta_8 TOP1SQ + \beta_9 RTS + \varepsilon \quad (6)$$

where $\alpha$ is the intercept, $\beta_i$(i=1,2,3,4,5,6,7,8,9,10,11) is the coefficient, $\varepsilon$ is the error term.

Regression results and robustness check are shown in Table 2. Among them, Regression 1 model is the OLS that

controls heteroskedasticity, Regression 2 is the fixed effects regression, Regression 3 is Pooled OLS, Regression 4 is an asymptotic fixed-effects regression, and Regression 5 is the panel corrected standard errors (PCSE). This paper mainly relies on the results of Regression 5, the PCSE.

Table 2. Regression Results and Robustness Check

| Independent Variable | Dependent Variable: EPS | | | | |
|---|---|---|---|---|---|
| | Reg. 1 | Reg. 2 | Reg. 3 | Reg. 4 | Reg. 5 |
| | Coef. | Coef. | Coef. | Coef. | Coef. |
| | (t-value) | (t-value) | (t-value) | (t-value) | (t-value) |
| SCORE | 0.001 28 | -0.000 282 | 0.001 28** | -0.000 282 | 0.001 28** |
| | (1.60) | (-0.17) | (2.42) | (-0.20) | (2.11) |
| INS | 0.004 33*** | 0.001 03 | 0.004 33*** | 0.001 03* | 0.004 33*** |
| | (7.99) | (1.49) | (6.39) | (2.33) | (6.28) |
| SIZE | 0.421*** | 0.366*** | 0.421*** | 0.366*** | 0.421*** |
| | (16.73) | (5.79) | (15.79) | (6.34) | (10.29) |
| GROWTH | 0.000 013 3* | 0.000 007 15* | 0.000 013 3 | 0.000 007 15 | 0.000 013 3* |
| | (1.88) | (1.87) | (1.88) | (1.74) | (1.81) |
| LEV | -0.005 63*** | -0.007 70*** | -0.005 63*** | -0.007 70*** | -0.005 63*** |
| | (-8.93) | (-4.42) | (-19.05) | (-6.16) | (-8.59) |
| TURN | 0.116*** | 0.307*** | 0.116*** | 0.307*** | 0.116*** |
| | (6.76) | (3.28) | (10.26) | (8.20) | (7.28) |
| TOP1 | 0.008 60*** | -0.005 92 | 0.008 60*** | -0.005 92 | 0.008 60*** |
| | (3.55) | (-0.84) | (6.76) | (-1.61) | (3.77) |
| TOP1SQ | -0.000 108*** | 0.000 145* | -0.000 108*** | 0.000 145** | -0.000 108*** |
| | (-3.21) | (1.91) | (-6.04) | (3.15) | (-3.34) |
| RTS | -0.002 32 | -0.000 959 | -0.002 32 | -0.000 959 | -0.002 32 |
| | (-1.33) | (-0.33) | (-1.17) | (-0.54) | (-1.46) |
| _CONS | -3.569*** | -2.960*** | -3.569*** | -2.960*** | -3.569*** |
| | (-13.42) | (-4.57) | (-9.20) | (-6.27) | (-9.31) |
| N | 2016 | 2016 | 2016 | 2016 | 2016 |

Note: t statistics in parentheses. *, **, *** denotes significance at 1%, 5%, 10% significance level, respectively.

Table 2 shows the regression results. The social responsibility rating score is positively correlated with EPS and it is significant at the 5% significance level.

Next, the dependent variable ROA is substituted in the same test. This paper interprets the results of Regression 4, based on the asymptotic fixed-effects regression. The results are as follows:

Table 3. Regression Results and Robustness Check

| Independent Variable | Dependent Variable: ROA | | | | |
|---|---|---|---|---|---|
| | Reg. 1 Coef. (t-value) | Reg. 2 Coef. (t-value) | Reg. 3 Coef. (t-value) | Reg. 4 Coef. (t-value) | Reg. 5 Coef. (t-value) |
| SCORE | 0.0175 | 0.0806 | 0.0175* | 0.0806*** | 0.0175 |
| | (1.61) | (1.32) | (2.28) | (4.68) | (1.39) |
| INS | 0.0379*** | 0.0152 | 0.0379*** | 0.0152* | 0.0379*** |
| | (4.32) | (1.10) | (5.82) | (2.17) | (5.17) |
| SIZE | 3.610*** | 2.491* | 3.610*** | 2.491* | 3.610*** |
| | (8.28) | (1.95) | (6.69) | (2.06) | (6.32) |
| GROWTH | 0.000 189 | 0.000 250* | 0.000 189 | 0.000 250 | 0.000 189 |
| | (1.55) | (1.67) | (1.31) | (1.55) | (0.95) |
| LEV | -0.101*** | -0.122*** | -0.101*** | -0.122** | -0.101*** |
| | (-8.98) | (-4.27) | (-11.23) | (-3.28) | (-8.49) |
| TURN | 1.546*** | 5.250*** | 1.546*** | 5.250*** | 1.546*** |
| | (6.37) | (4.19) | (5.18) | (6.85) | (6.40) |
| TOP1 | 0.0822* | -0.125 | 0.0822** | -0.125** | 0.0822* |
| | (1.91) | (-1.06) | (2.60) | (-2.65) | (1.80) |
| TOP1SQ | -0.000 867 | 0.002 38* | -0.000 867* | 0.002 38** | -0.000 867 |
| | (-1.58) | (1.78) | (-2.12) | (3.36) | (-1.43) |
| RTS | -0.0248 | -0.0375 | -0.0248 | -0.0375 | -0.0248 |
| | (-0.71) | (-0.68) | (-0.92) | (-1.17) | (-0.53) |
| _CONS | -24.08*** | -8.670 | -24.08*** | -8.670 | -24.08*** |
| | (-4.65) | (-0.72) | (-5.01) | (-1.09) | (-3.99) |
| N | 2016 | 2016 | 2016 | 2016 | 2016 |

Note: t statistics in parentheses. *, **, *** denotes significance at 1%, 5%, 10% significance level, respectively.

Table 3 shows that the social responsibility rating score is positively correlated with the ROA and it is significant at the 1% significance level. It reaches the same conclusion as regressions based on Equation (6).

This paper, then verifies the impact of corporate social responsibility for the performance of listed companies in the sports industry based on the super-efficient DEA-Tobit model.

Generally speaking, the frontier efficiency analysis method first establishes a production frontier, which refers to the highest output value that all listed companies in the sports industry can achieve under the current technical level. The efficiency value of the individual on the production frontier is higher. Subsequently, the individual not on the production frontier surface is observed, and the magnitude of the deviation from the frontier is captured to measure the level of efficiency. The efficiency value measured by this method is a relative value. At present, there are two main methods for studying the operational efficiency of listed companies in the sports industry, namely the parametric method and the nonparametric method. This paper uses the DEA method in the nonparametric method, and use multi-input and multi-output data to determine whether an individual is located on the production frontier surface and the efficiency value of the individual. When the final result is 1, it indicates that the decision-making unit (DMU) is valid; when the final result is not 1, it indicates that the DMU is invalid, and the DMU value is usually between 0-1. The reason why this paper chooses DEA method is as follows: Firstly, because the data of listed companies in China's sports industry is difficult to obtain, the non-parametric method largely prevents the research from being limited by the amount of data; secondly, the DEA method is an empirical research method with relatively

simple operation, which is in line with the current development status of China's sports industry. This paper does not introduce the mathematical principles of the DEA method.

This paper mainly studies the efficiency of DEA technology. Under normal circumstances, the construction of a model requires some assumptions as a premise, but the scale returns of listed companies in the sports industry remain unchanged. This shows that listed companies in the sports industry can increase the input amount to ensure the same proportion of output growth, which is obviously not in line with the actual situation. At the same time, in the BCC model, technical efficiency mainly includes pure technical efficiency and scale efficiency. Therefore, this paper reckons that considering the unique characteristics of listed companies in China's sports industry, it is more appropriate to improve the cost input to be in line with the actual situation, and it is more convenient to implement. Therefore, this paper chooses the input-oriented method.

Before using the DEA method to measure the efficiency value of listed companies in the sports industry, this paper first selects the input and output indicators. This paper considers the feasibility of obtaining data for the actual situation of China's listed companies in the sports industry at this stage, mainly based on the intermediary method and asset method, to select specific indicators to measure the efficiency value. In this paper, the indicator of number of employees is selected in terms of human capital, the fixed assets indicator is selected in terms of physical capital, and the operating expenditure indicator is selected in the business process as the input indicators. Output indicator is operating income. In addition, the DEA method requires that the number of samples is smaller than the number of input indicators and output indicators. The choice of similar indicators is chosen to avoid the impact of the accuracy of efficiency measurement due to too many indicators in the case of a limited number of samples.

The DEA method analyzes the relative efficiency of companies by analyzing the multi-input and multi-output efficiency of each decision-making unit (Dong, 2017). The DEA model is a model in which the dependent variable is limited, also known as the review regression model. In the calculation of DEA, the DMU controls the input and output, but the measured efficiency value is only between [0, 1] and has a truncation feature, which causes the dependent variable of the regression equation to be limited to this interval. Significant differences in the efficiency of DMU are largely due to the large differences in such uncontrollable factors. However, the values of the independent variables and dependent variables in the Tobit model are different, making it easier to obtain better-performing estimates. Therefore, the Tobit model is the best choice for the second stage of analysis (Dong, 2017; Han & Miao, 2010). The DEA-Tobit two-stage analysis framework is generally used in the literature to deal with this problem. In the first stage, the DEA model is used to calculate the efficiency score of each decision unit; the second stage is to perform the regression of the efficiency score on various uncontrollable factors (Schwab & Oates, 1991; Chen, 2008).

Since the expenditure efficiency scores of China's 31 listed companies in the sports industry in 2009-2016 are calculated as panel data, this paper uses the super-efficiency DEA-Tobit model in the next section. The formula for this model is as follows:

$$y_i^* = x_i\beta + \varepsilon_i \quad \varepsilon_i \sim N(0, \sigma^2)$$

$$y_i = \begin{cases} y_i^* = x_i\beta + \varepsilon_i, y_i^* > 0 \\ 0, y_i^* \le 0 \end{cases} \tag{7}$$

In the above formula, $y_i$, $x_i$, and $\beta$ represent efficiency values, explanatory variables, and unknown parameter vectors, $\varepsilon_i \sim N(0, \sigma^2)$.

This paper selects the input-oriented model with variable scale return and uses MaxDEA_Ultra_6.8 software to calculate the super efficiency value. The calculated results are shown in Table 4:

Table 4. DEA-Tobit Regression Results

| | DEA |
|---|---|
| | (t-value) |
| SCORE | 0.000 711** |
| | (2.08) |
| INS | 0.0273** |
| | (-2.14) |
| SIZE | 0.0199** |
| | (2.09) |
| GROWTH | 0.662 |
| | (0.78) |
| LEV | 0.163* |
| | (1.77) |
| TURN | 0.002 03*** |
| | (4.06) |
| TOP1 | 0.877* |
| | (1.67) |
| TOP1SQ | -0.0666 |
| | (-1.42) |
| RTS | 0.001 70** |
| | (2.08) |
| _CONS | -0.256** |
| | (-2.23) |
| N | 2016 |

Note: t statistics in parentheses. *, **, *** denotes significance at 1%, 5%, 10% significance level, respectively.

Table 4 shows the regression results: the social responsibility rating scores are positively correlated and are significant at the 5% significance level.

Finally, this paper verifies the impact of social responsibility for the performance of listed companies in the sports industry based on the threshold panel.

This paper selects the return on equity (ROE), which is the independent variable of the return on equity, and explores whether the level of return on equity in the sports industry and whether different financial performances themselves lead to the fulfillment of corporate social responsibility has a certain degree of significant impact on corporate performance. The ROE can objectively reflect whether a listed company is profitable or not, and refers to the ratio of the company's profit to the average shareholder's equity. The higher the ROE were, the higher the return on the investment behavior of the company would be. On the contrary, it indicates that the investment behavior of the company fails to bring obvious benefits to the company. The ROE index can reflect the ability of companies to use their own capital to obtain profits. When the profitability of companies is poor, fulfilling social responsibility will bring a larger proportion of cost investment, which is not good for corporate performance. When the company's profitability is strong, the cost of investing in social responsibility activities is small, and it does have a negative impact on the business itself.

Therefore, this paper posits that there may be one or more thresholds. If the ROE is too low, it will be negatively related to corporate performance, and if the ROE is higher than a certain value, it will promote corporate performance.

For unit root test and endogeneity test, the test method used in this paper is the same as the previous one. The test results show that the ROE is stationary and all variables are exogenous.

When using the panel threshold model, the first step is to verify whether the panel data have a threshold effect or not. The second step is to further confirm that the panel data has several thresholds and its threshold value. In this paper, the Bootstrap check is used to test the threshold value of the panel data. A total of 300 samples are taken, and the critical values are 1%, 5% and 10%, respectively. The test results are shown in Table 5.

Table 5. Results of Self-Sampling Inspection of Threshold Effect

| Model | F Value | P Value | BS Frequency | Threshold | | |
|---|---|---|---|---|---|---|
| | | | | 1% | 5% | 10% |
| Single Threshold | 1151.088*** | 0.000 | 300 | 38.880 | 26.239 | 18.246 |
| Double Threshold | 533.286*** | 0.000 | 300 | 21.616 | 13.261 | 11.422 |
| Triple Threshold | 0.000* | 0.100 | 300 | 0.000 | 0.000 | 0.000 |

Note: t statistics in parentheses. *, **, *** denotes significance at 1%, 5%, 10% significance level, respectively.

The results in Table 5 show that in the single threshold model and the double threshold model, the P values are all smaller than 0.05, which indicates that the 5% significance level is significant, while the triple threshold model has a P value greater than 0.05, which indicates that the panel data has only two threshold values.

After determining the threshold effect of corporate social responsibility, this paper tests and estimates these two thresholds. The results show that in the double threshold model, the first threshold is 47.052%, and the interval is [47.052, 47.052] at the 95% confidence level. The second threshold is -10.599%, and the interval is [-11.413, 0.783] at the 95% confidence level. After calculating the second threshold, the first threshold is calculated again, and the result is still 47.052.

Regression on EPS is as follows.

$$\text{EPS} = \alpha + \beta_1 * I * ROE(ROE \le \gamma_1) + \beta_2 * I * ROE(\gamma_1 \le ROE \le \gamma_2) + \beta_3 * I * ROE(ROE \ge \gamma_2) + \beta_4 SCORE + \beta_5 INS + \beta_6 SIZE + \beta_7 GROWTH + \beta_8 LEV + \beta_9 TURN + \beta_{10} TOP1 + \beta_{11} TOP1SQ + \beta_{12} RTS + \varepsilon \quad (8)$$

Regression results and robustness check are shown in Table 6. Among them, Regression 1 model is the Panel Threshold model, Regression 2 is the fixed-effect model that uses ROE as the primary term and controls heteroskedasticity, Regression 3 is the fixed-effect model that uses ROESQR and controls heteroskedasticity. This paper mainly relies on the results of Regression 1, the Panel Threshold model.

Table 6. Regression Results and Robustness Check

| Independent Variable | | Dependent Variable: EPS | | |
|---|---|---|---|---|
| | | Regression 1 Coef. (t-value) | Regression2 Coef. (t-value) | Regression3 Coef. (t-value) |
| Explanatory Variable | ROE | | 0.000 767 4 (0.000 585 7) | |
| | ROESQR | | | 4.40e-08 (6.18e-09) |
| | ROE<-10.599 | 0.009 22*** (18.92) | | |
| | -10.599<=ROE<47.052 | 0.0314*** (37.79) | | |
| | 47.052<=ROE<47.052 | 0.000 276*** (3.44) | | |
| Control Variable | SCAORE | 0.001 49** (2.12) | 0.000 962 3 (0.001 586 7) | -0.000 046 3 (0.001 628 3) |
| | INS | 0.000 949** (2.34) | 0.001 186 2 (0.000 683 6) | 0.001 071 5 (0.000 693 3) |
| | SIZE | 0.257*** (12.81) | 0.345 636 (0.061 239 3) | 0.363 409 5 (0.063 193 9) |
| | GROWTH | -2.42e-08 (-0.00) | 6.55e-06 (3.49e-06) | 7.12e-06 (3.79e-06) |
| | LEV | -0.003 44*** (-7.46) | -0.007 586 4 (0.001 670 8) | -0.007 739 8 (0.001 744) |
| | TURN | 0.0414*** (3.36) | 0.299 249 8 (0.092 710 9) | 0.307 269 9 (0.093 738 1) |
| | TOP1 | -0.001 24 (-0.46) | -0.006 176 4 (0.006 883 8) | -0.005 999 (0.007 040 4) |
| | TOP1SQ | 0.000 006 23 (0.19) | 0.000 146 7 (0.000 073 9) | 0.000 145 6 (0.000 075 6) |
| | RTS | -0.002 58* (-1.73) | -0.000 879 6 (0.0027724) | -0.000 977 8 (0.002 928 2) |
| _CONS | CONSTANT | -2.050*** (-9.15) | -2.819 643 (0.623 669 6) | -2.936 788 (0.647 111) |
| | $R^2$ | 0.6450 | 0.1531 | 0.1287 |

Note: t statistics in parentheses. *, **, *** denotes significance at 1%, 5%, 10% significance level, respectively.

The regression results show that in the double threshold panel model, the overall goodness of fit of the above variables is 0.6450, which is higher than the goodness of fit of the multivariate linear regression model and the quadratic function model, and the regression on corporate social responsibility is also more significant. Therefore, the relationship between corporate social responsibility and EPS cannot be explained by only the multiple linear and quadratic function models. The relationship between the two tends to be a piecewise linear function. In other words,

the two thresholds of corporate social responsibility divide the relationship between corporate social responsibility and EPS into three intervals, and the relationship between each interval is slightly different. This paper finds that regardless of the level of ROE, corporate social responsibility has a positive effect on corporate financial performance. When ROE of listed companies in the sports industry is between -10.599% and 47.052%, corporate social responsibility and corporate performance show a stronger positive correlation with a coefficient of 0.0314. When the return on equity is below -10.599% or above 47.052%, corporate social responsibility and corporate performance remain positively correlated, but at this stage, the relationship between the two becomes stable. This shows that when corporate profitability is at a very low or high level, fulfilling corporate social responsibility does not greatly promote financial performance.

## 6. Conclusion

This paper collects the data of China's listed companies in the sports industry in 2009-2016, and builds a relationship between the CSR performance scores and the performance of listed companies in the sports industry by constructing a fixed effect model that controls heteroscedasticity. The threshold panel model is used to study the relationship between corporate social responsibility and corporate performance in the sports industry. The final regression results show that: First, in the Chinese sports industry, the company's fulfillment of social responsibility promotes corporate performance. Second, there is no pure linear relationship or U-shaped relationship between corporate social responsibility and the performance of listed companies in the sports industry, but is divided into three intervals by two thresholds. It can be understood that, compared with other stages, when the profitability of listed companies in the sports industry is at an intermediate level, their investment in social responsibility will lead to greater financial performance improvement. However, empirical evidence shows that regardless of the level of financial performance of the company *per se*, the investment in social responsibility always has a positive impact on corporate performance. Therefore, fulfilling corporate social responsibility is beneficial to improving the performance of listed companies in the sports industry.

The fulfillment of social responsibility is the fundamental guarantee for the long-term performance of the company, and it is a commitment of the company to contribute to sustainable development in order to meet the needs of its stakeholders (Wang, 2014). There are still many deficiencies and improvements in the fulfillment of social responsibility in China's sports industry. At present, China's listed companies in the sports industry are developing very rapidly, and it is very necessary to balance the relationship between corporate social responsibility and financial profitability to achieve a win-win situation. In order to help listed companies in the sports industry improve their performance, this paper proposes the following policy implication levels: government and enterprise:

The government can confirm the basic system and structure in the process of social operation, and the government also has an important influence on cultural values. It has an irreplaceable role in promoting the social responsibility of companies, including companies in the sports industry. Therefore, the Chinese government can implement the strategy from the following aspects:

First, strengthen the supervision of the social responsibility information about companies in the sports industry disclosure. The implementation of the social responsibility information disclosure system of sports companies can not only help sports companies that actively undertake social responsibility to enhance their social reputation, but also form strong social pressure on companies that evade social responsibility. At present, the social responsibility information disclosure system of China's sports companies has not yet been fully implemented. Therefore, the government needs to increase the supervision and inspection of social responsibility information, disclosure of listed companies in the sports industry to ensure the transparency and openness of social responsibility performance information.

Second, restructure the corporate regulatory structure by reforming corporate law. The government can redefine the fiduciary duty of the board of directors of a sports company, stipulating that the directors only have to bear the fiduciary responsibility of the material capital owners such as shareholders or the responsibility of the agent and at the same time bear the same responsibility for non-shareholder stakeholders. The government should also supervise the establishment of a social responsibility director system for sports companies, protect consumer rights and employees' interests, and prevent the company's production and operation activities from causing greater damage to the ecological environment.

Third, let the regulatory role of the government and non-governmental organizations be fully utilized. On the one hand, government organizations should ensure that the labor inspection and the announcement of the monitoring results of sports companies are strengthened. On the other hand, the government should also expand the intensity of positive publicity, accurately announce the status quo and improvement effects of rights and interests protection work

of companies in the sports industry, thereby promoting the company's initiative to improve management quality and curbing non-responsible behavior. Non-government organizations need to promote the social ethics certification honors such as "excellent corporate citizenship" or "green enterprise" in light of China's actual situation to regulate the social welfare activities and environmental protection behaviors of all companies in the sports industry.

Different from the external government pressure, the commercial interests that supports companies may bring to fulfill their social responsibilities are not only the important internal economic forces that promote their social responsibilities, but also their more lasting motivation. This paper believes that the following methods are worthy of referring to and implementing by Chinese companies in the sports industry:

First, implement business ethics education. Ren (2010) pointed out that the main countermeasure to enhance the moral values and basic values of senior managers and employees is to implement business ethics education. For example, using corporate ethics issues and corporate social responsibility cases, and conducting research on corporate social functions within the company. At the same time, sports companies must update their concept of social responsibility, and clearly assumes that social responsibility is neither limited to a single energy-saving emission reduction or charity nor a cost-increasing paying measure. Companies should understand that fulfilling social responsibilities can achieve rewards. It is an investment behavior, so that ethical and environmental behavior decisions can be closely integrated with the company's comprehensive competitiveness, and at the same time it is linked to corporate image and marketing strategy.

Second, embody the responsibility of sports companies and strengthen cooperation with the industry. When setting up their own social responsibility strategy, companies in the sports industry should combine the actual situation of the company and choose social responsibility objectives that are directly or indirectly related to the business objectives of the company, so that the business objectives can be realized and improved. In addition, it encourages sports companies to conduct cross-company and industry-wide cooperation in the practice of social responsibility, such as collective public welfare actions of a number of companies. On the one hand, the cost of social responsibility activities can be shared, and on the other hand, competitive environment can be improved most effectively.

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