

Corporate Environmental Responsibility, Media Attention and Financial Performance

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Abstract. Taking listed companies of Chinese manufacturing enterprises as the research object, this paper utilizes the method of empirical analysis to deeply explore the relationship between environmental responsibility and financial performance of Chinese manufacturing enterprises. Enterprises' environmental management behaviors are exposed to the public through social media. Enterprises get media attention by fulfilling their environmental responsibilities, improve their business conditions, and ultimately enhance their corporate performance. The study enriches the related research on CER and financial performance, explores the impact of new media based on existing traditional media research, and makes policy recommendations on how to promote corporate environmental responsibility to enterprises, media, government and the public.

Keywords: Corporate environmental responsibility, media attention, financial performance.

1. Introduction

The World Bank environmental study points out that environmental problems in the process of industrialization in developing countries are becoming increasingly serious, such as global warming, destruction of vegetation, shortage of resources, industrial waste, and air and water pollution. In 2021 alone, China's industrial hazardous waste production will be 57.55 million tons, an increase of 11.8% from 2020, and the government has issued more than 130,000 environmental administrative penalties, with the amount of fines and forfeitures amounting to 11.687 billion yuan. Enterprises create economic value for society, which is an important part of modern society, and at the same time become the main source of environmental pollution and damage (Yang et al., 2017).

While creating economic benefits, enterprises are gradually realizing the need to be responsible for the ecological environment. Because the ultimate goal of most enterprises is to maximize value, and their decisions and behaviors are aimed at making profits, the key to whether enterprises can take the initiative to assume environmental responsibility lies in whether they can gain economic benefits from it (Kathy and Sylvia, 2011). How to solve environmental problems, improve the environmental and economic benefits of enterprises, and promote corporate environmental responsibility (CER) has become an important topic in the academic world, and the public's awareness of and concern for CER are also increasing day by day. As the "factory of the world", China's manufacturing industry accounts for about 26% of GDP, and as a pillar industry, it is crucial to China's economic structure. Compared with the service industry and financial industry, the production activities of the manufacturing industry can directly cause pollution of water, air and soil, which is the main source of environmental pollution. However, due to the late start of the domestic environmental governance, the emission standards are not strict compared with developed countries, the lack of supporting regulations and the basic environmental protection facilities are simple, and the environmental protection awareness of a large number of enterprises is still relatively weak (Chen Yufen, 2020). In the process of economic growth, does the environmental responsibility of manufacturing enterprises have an impact on their production and operation? This is the question that this paper wishes to explore.

2. Literature References and Hypothesis

2.1. CER and financial performance

Based on Freeman's (1984), Clarkson's (1995) and Hossain et al.'s (2016) studies on stakeholders, manufacturing enterprises, as part of the natural environment and a pillar of economic development,

should be responsible for the environmental pollution brought about by their own economic development and bear the corresponding environmental risks. Stakeholders outside the enterprise are no longer independent economic agents and belong to a community of interest with the enterprise. This paper argues that firms will adopt an environmentally responsible approach to meet the interests of stakeholders, including the needs of customers, shareholders, government and other stakeholders who provide sustainable resources to the firm, and that informal and formal institutional norms influence firms' environmental decisions.

According to Hart (1995), Jamie et al. (2007) on the Resource Based View (Resource Based View), enterprises that use natural resources rationally to arrange strategic planning will have more value, environmentally sensitive enterprises, such as manufacturing enterprises, have a greater willingness to invest in improving the environment, reducing compliance risk effectively improves the enterprise environmental reputation, optimizes the access to resources, and strengthens the relationship between the firm and its stakeholders. Therefore, when firms begin to invest more in environmental management and implement environmentally friendly behaviors, economic benefits are positively incentivized. However, as the level of corporate environmental responsibility increases, in order to meet the expectations of stakeholders, under the condition that the resources of the enterprise are limited, the production and financial resources are occupied, the production efficiency is reduced and the financial risk is increased, and the marginal revenue is likely to be unable to make up for the consumed marginal cost, which brings about poorer financial performance. Accordingly, the hypothesis is proposed:

Hypothesis 1: Environmental responsibility and financial performance of manufacturing companies show an inverted U-shaped relationship.

2.2. CER, media attention and financial performance

According to Tucker and Melew's (2005) study of corporate reputation, product information and decisions of a company are transmitted to stakeholders, who make judgments about its image based on the information they receive about the company. However, since the management of listed companies is directly involved in relevant strategic decisions and knows more about internal information than other stakeholders, stakeholders outside the enterprise can only rely on publicly disclosed information to judge the development of the enterprise, which is in an information disadvantage, and there is information asymmetry in the market, which brings about the problem of moral hazard. The media, as an external monitoring mechanism, can effectively solve the information asymmetry, is the main information disseminator for the public, and is also the creator of corporate image, which directly affects the reputation of the enterprise. Through multiple channels, new media can realize more timely, diversified and interactive communication than traditional media, which has a more significant impact on corporate reputation (Xu Nan, 2013).

Compared with the service industry and the financial industry, the manufacturing industry directly produces environmentally hazardous substances and is the source of industrial pollution. Under the background of building an ecological civilization nowadays, the fulfillment of the environmental responsibility of manufacturing enterprises is an important content of stakeholders' attention and a hotspot of media reports. When stakeholders from all sides urgently need information on corporate environmental responsibility, the vast media serving the public information needs will pay more attention to the behavior of enterprises in fulfilling their environmental responsibility (Yang Daoguang et al., 2017). Through the transfer of information function, media reports cause changes in the capital market, affecting the stock price, forced by external pressure, corporate executives they will take appropriate behavior to meet the market's expectations in order to protect their own interests.

Hypothesis 2: Media attention mediates the relationship between CER and financial performance.

3. Empirical analyses

3.1. Samples and variables

Manufacturing enterprises, as an industry with more serious environmental pollution problems, are more worthy of in-depth understanding of the fulfillment of their environmental responsibility. In this paper, the listed companies in China's A-share manufacturing industry in Shanghai and Shenzhen from 2010 to 2020 are selected as samples. The financial data are from CSMAR, the media attention data are from CNRDS, and the environmental responsibility data are from the environmental responsibility scores in the Bloomberg Listed Company ESG Report Measurement System. The main continuous variables are deflated at the 1% and 99% quantile.

Table 1. Measurement for all variables

Variables	Calculation method
ROA	Net profit/total assets.
CER	Corporate Environmental Responsibility Score.
Media	Number of media reports +1. Takes the natural logarithm.
Lev	Average annual liabilities/average annual assets.
TC	Total Operating Costs at Year End Take the natural logarithm.
AGE	Number of years a company has been listed.
Growth	Relative growth rate of sales.
Size	The natural logarithm of the firm's total assets at the end of the year.
Kir	Net Fixed Assets/Average Annual Employees of the Firm Ratio.

3.2. Descriptive statistics

Table 2. Descriptive statistics

Variables	N	Mean	SD	Min	Max
ROA	17,973	0.0424	0.0608	-0.228	0.204
CER	17,973	23.01	14.76	-3	73.43
Media	17,973	1.381	0.555	0	4.148
Size	17,973	9.533	0.502	8.568	11.03
Lev	17,973	0.394	0.202	0.0502	0.944
TC	17,973	5.241	0.605	2.858	7.947
Kir	17,973	44.08	78.45	0	4,801
AGE	17,973	8.709	7.050	0	30
Lev	17,973	3.937	2.019	0.502	9.441

3.3. Correlation analyses

Table 3. Pearson correlation matrix

	ROA	CER	Media	Lev	size	Growth	Kir	TC
ROA	1							
CER	0.464 ***	1						
Media	0.112 ***	0.245 ***	1					
Lev	-0.413 ***	-0.126 ***	0.200 ***	1				
size	-0.018 **	0.197 ***	0.458 ***	0.467 ***	1			
Growth	0.162 ***	0.072 ***	0.058 ***	0.082 ***	0.100 ***	1		
Kir	-0.079 ***	-0.025 ***	0.045 ***	0.138 ***	0.220 ***	0.008	1	
TC	-0.014 *	0.196 ***	0.439 ***	0.510 ***	0.910 ***	0.122 ***	0.162 ***	1
AGE	-0.202 ***	-0.037 ***	0.189 ***	0.400 ***	0.429 ***	-0.0110	0.128 ***	0.428 ***

The Pearson correlation coefficient matrix between the variables of the full sample is presented in the table. The correlation coefficient between corporate environmental indicators and financial performance is 0.464, a significant positive correlation at the 1% level, which initially suggests that corporate environmental responsibility contributes to financial performance to some extent.

3.4. Main results

This paper uses STATA to process the panel data. The HAUSMAN test shows that between random effects and fixed effects, the fixed effects model is more appropriate. Therefore, this paper uses the fixed effect model of panel data for empirical analysis.

3.4.1 Regression results on the impact of corporate environmental responsibility on financial performance

As shown in the table, the first column is the regression result of the whole sample enterprises, the fit is 0.559, the fit is high, the influence coefficient of corporate environmental responsibility (CER) on return on assets (ROA) is 6.85, significantly positively correlated at 1% level; the influence coefficient of squared term of the environmental indicators (CER*CER) is -0.076, significantly negatively correlated at 1% level. The extreme point of the CER indicator is 45.06, which is greater than the minimum value of -3 and smaller than the maximum value of 73.43, indicating that overall the environmental responsibility of manufacturing enterprises and return on assets have an inverted U relationship, i.e., with the continuous improvement of the level of environmental responsibility fulfillment of the manufacturing enterprises will improve the economic performance of the enterprise, but the assumption of the environmental responsibility exceeding the threshold will have a negative impact on the economic performance of the enterprise, and the hypothesis H1 is verified.

From the descriptive statistics, it can be seen that the level of environmental responsibility of Chinese manufacturing enterprises varies greatly, and the level of environmental responsibility of most enterprises is low, still in the first stage, i.e., on the left side of the inflection point, and the impact of the environmental responsibility of most manufacturing enterprises on economic performance is far from optimal to achieve the maximization of the environmental benefits and economic benefits.

Table 4. The effect of CER on financial performance

	Full sample	SOE sample	Non-SOE sample
CER	6.850*** (0.067)	4.935*** (0.121)	7.755*** (0.079)
CER*CER	-0.076*** (0.001)	-0.055*** (0.002)	-0.084*** (0.001)
Lev	-7.893*** (0.193)	-9.619*** (0.335)	-6.747*** (0.234)
Size	-6.880*** (1.483)	2.576 (2.618)	-10.913*** (1.799)
AGE	-0.138** (0.05)	.084** (0.096)	-0.046** (0.065)
Growth	11.374*** (0.545)	14.086*** (1.24)	10.262*** (0.59)
TC	11.915*** (1.256)	7.016*** (2.316)	14.125*** (1.478)
Kir	-0.010** (0.004)	-0.008 (0.005)	-0.009 (0.007)
Constant	-24.588*** (8.865)	-59.858*** (14.981)	-16.233 (11.055)
N	17973	5373	12600
R-squared	0.559	0.473	0.601

3.4.2 The effect of media attention

From the model (1) in the table, it can be seen that the coefficient of the impact of corporate environmental responsibility on financial performance is 6.850, which is significant at the 1% level, while the estimated coefficient of the squared term of corporate environmental responsibility is -0.076, which is significant at the 1% level, indicating that the impact of the direct effect of corporate environmental responsibility on economic performance is significant, and therefore further testing of Equation 4-2. From the results of model (2), it can be seen that the coefficient of the impact of media attention on corporate environmental responsibility is 0.605, which is significant and positive at the 1% level, indicating that to a certain extent, corporate environmental responsibility can promote the improvement of media attention, and from the results of model (4), the regression coefficients of the primary term, the squared term, and the degree of media attention of the corporate environmental responsibility are all significant at the 1% level, and the After adding the media attention variable, the regression coefficient of corporate environmental responsibility on financial performance increases from 6.850 to 6.929, and both are significantly related. The regression results show that corporate environmental responsibility has a positive incentive effect on corporate economic performance through media attention, and hypothesis H2 is verified.

Table 5. The effect of media attention

	(1) ROA	(2) Media	(3) Media	(4) ROA
Media				0.091*** (0.006)
CER	6.850*** (0.067)	0.605*** (0.026)	0.230*** (0.08)	6.929*** (0.068)
CER*CER	-0.076*** (0.001)		0.005 (0.001)	-0.076*** (0.001)
Lev	-7.893*** (0.193)	0.464** (0.221)	0.131 (0.231)	-7.905*** (0.192)
Size	-6.880*** (1.483)	37.868*** (1.777)	38.129*** (1.776)	-10.355*** (1.493)
AGE	-0.138** (0.05)	0.061 (0.059)	0.024 (0.059)	-0.140*** (0.049)
Growth	11.374*** (0.545)	0.008 (0.649)	0.340 (0.653)	11.343*** (0.541)
TC	11.915*** (1.256)	8.341*** (1.504)	8.705*** (1.505)	11.121*** (1.250)
Kir	-0.010** (0.004)	-0.032*** (0.005)	-0.032*** (0.005)	-0.007* (0.004)
Constant	-24.588*** (8.865)	-281.444*** (10.621)	-27.960*** (10.621)	0.892 (8.981)
N	17973	17973	17973	17973
R-squared	0.559	0.239	0.24	0.564

4. Robustness test

In order to verify the robustness of the base regression results, this paper conducts a robustness test, referring to the study of Tian Hong (2009), replacing the explanatory variable Return on Assets (ROA), and adopting the Return on Equity (ROE) to regress the model of Hypothesis H1. The Return on Equity is an important indicator for evaluating the economic performance of enterprises, and it will not essentially change the relationship between the environmental responsibility of the enterprise and its financial performance, the corresponding regression results are shown in the table.

The test results show that the sign and significance of the coefficients of the main explanatory variables are the same as the regression results in the table, and the results of the model can be considered robust.

Table 6. Robustness test

	ROE
CER	5.312*** (1.000)
CER*CER	-0.060*** (0.013)
Size	-6.567*** (22.183)
AGE	-2.124*** (0.741)
Growth	8.334* (8.115)
TC	11.737*** (18.811)
Lev	16.253*** (2.928)
Kir	-0.053 (0.059)
N	17973
R-squared	0.532

5. Summary

This paper takes the impact of corporate environmental responsibility fulfillment on financial performance as the focus of research, selects A-share manufacturing companies listed in Shanghai and Shenzhen from 2010 to 2020 as samples, and adopts empirical analysis to explore the relationship between corporate environmental responsibility and economic performance, and draws the following conclusions:

First, the fulfillment of corporate environmental responsibility has a non-linear impact on economic performance, showing an inverted U-shaped relationship. In the first stage the fulfillment of environmental responsibility improves stakeholders' confidence in the enterprise and market competitiveness, and promotes financial performance, but with the increase of environmental inputs, when the net value of marginal benefit and marginal cost is negative, it will have a negative impact. The level of environmental responsibility of Chinese manufacturing enterprises varies widely, and most of them are on the low side, still on the left side of the inflection point, failing to maximize environmental and economic benefits.

Second, corporate environmental responsibility has a positive incentive effect on corporate economic performance through media attention. Media attention is a bridge in the process of enterprises' fulfillment of environmental responsibility and thus enhancement of corporate financial performance. Enterprises get media attention through the fulfillment of their environmental responsibility, enhance their corporate image, meet the expectations of their stakeholders, establish long-term competitive advantages, and ultimately bring about the enhancement of corporate performance.

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