An Empirical Study on the Interactive Effect of Real Earnings Management and Corporate Environmental Responsibility on Media Attention

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Abstract: To study the influence mechanism of corporate governance on media attention, this paper studies the interactive effect of real earnings management and corporate environmental responsibility on media attention. Using a data set of Chinese A-share listed companies from 2014 to 2018, this paper empirically tests this interactive effect and finds that less real earnings management or higher environmental responsibility draws more media attention, and there is a reinforcement interaction of environmental responsibility and real earnings management on media attention. The results indicate that promoting the implementation of environmental responsibility and strengthen the companies' sense of environmental responsibility can be a way for the government to supervise companies. Besides, actively playing the role of public opinion is an effective way of assessing companies for the media and companies should practically improve the moral responsibility, practicing the concept of green development.

1. Introduction

As an important external corporate governance subject, the media plays an increasingly important role in corporate governance. Due to its supervisory effect, companies' accounting fraud, tunneling by major shareholders and other acts self-interested actions are suppressed [1-2]. Few studies focus on the influence mechanism of corporate governance behavior on media attention. In which way to govern a company will attract more media attention? Is there any way to avoid media supervision? With continuous improvement of accounting standards and legal protection level, companies are more likely to implement real earnings management in order to make the company's performance look better. Real earnings management means manipulating the time or structuring of real transactions and firm resources to meeting reporting objectives [3]. So, if a company takes advantage of this information asymmetry, can it effectively hinder the media attention and reduce its pressure from media supervision?

In recent years, one of the primary goals of corporate governance has shifted is to increase interests of stakeholders, including society [4]. As one of the key parts of CSR (corporate social responsibility), we should not underestimate the effect of environmental responsibility on media attention. However, is the corporate environmental responsibility a pure moral behavior or a "disguise" to cover up the selfish behavior of the management?

Based on existing studies, this paper studies the influence mechanism of real earnings management on media attention under environmental responsibility, which provides practical significance for firms and policy-making. This paper selects a data set of A-share listed companies in Shenzhen and Shanghai stock markets in 2014-2018 and finds that less real earnings management or higher environmental responsibility draws more media attention, and there is a reinforcement interaction of environmental responsibility and real earnings management on media attention.

Probable innovations of this paper are as follows. Firstly, most of the previous studies focused on how media attention affects corporate governance while this study considers corporate governance as a motivation for the media. Secondly, different from most of the previous studies which took social responsibility as a whole to study the relationship between corporate governance and media attention, this paper studies this relationship from a specific aspect of CSR, putting forward more detailed and specific policy practical significance. Thirdly, this paper explores the relationship between real earnings management and media attention under the influence of environmental responsibility, providing a new perspective for the company itself and stakeholders to analyze corporate governance.

2. Literature Review

2.1 Corporate governance and media attention

Studies about media attention's motivation from the perspective of corporate governance are mainly based on self-development and pressure from other stakeholders.

The media tends to analyze or reprint information about companies for their self-development. Jensen's theory of media bias demonstrated that the media tends to report hot topics to increase their subscriptions. By studying all reported fraud cases in large U.S. companies, Dyck, Morse and Zingales proved that journalists blowing the whistle on corporate fraud for their own reputation and monetary advancement [5]. Miller believed that the media report abnormal behaviors of companies, and through effective analyzing, they can leave a good impression on the public and gain advertising revenue [6]. Other stakeholders of companies also play a role in the media's corporate governance. In countries where the government has higher ownership structure of media, the media is less independent and audit quality is relatively poorer [7]. Consumers can expose infringement to the media, which brings pressure to the infringers [8]. Investment institutions use media to manipulate decisions of the company, i.e. investment institutions identify lists of underperforming companies and make it public through the media, forcing changes of companies' policies [9].

2.2 Real Earnings Management and Corporate Environmental Responsibility

Existing studies mainly focus on the relation between the overall social responsibility and real earnings management, while few studies focus on the relation between environmental responsibility alone and real earnings management and they mainly discuss the relation from moral responsibility and opportunism.

On the one hand, real earnings management under a strong sense of social responsibility is reduced. Hong and Andrew discovered that more socially responsible firms have less real earnings management [10]. By studying Shanghai and Shenzhen A shares listed companies, Ning and Chen proved that under the influence of reputation responsibility effect, companies are more likely to actively reduce real earnings management activities. [11]. Pen and Pan found that CSR establishes barriers to prevent earnings management by increasing the opportunity cost of corporate and manager reputation [12]. On the other hand, the fulfillment of CSR may become a tool to cover up earnings management. Prior, Surroca and Tribó proposed that CSR is kind of the behavior of shifting the attention of stakeholders to cover up earnings management, which is an opportunistic strategy for management to reduce risks [13]. Wang proved that private listed companies with high degree of real earnings management perform better in social responsibility to cover up their real earnings manipulation [14]. Wan and Liu proved that managers may try to mislead stakeholders about the company's value and financial performance, and there is a positive correlation between CSR and real earnings management [15].

3. Research Hypothesis

Companies with higher transparency usually have better reputation and more public attention, so with lower costs and the instinct to cater to public interest, the media tends to cover companies with higher transparency more [9]. Earnings management is an important standard of corporate transparency [16]. Deceived by distorted or false information delivered by earnings management, decisions of investors and regulators are usually influenced, which affects the efficiency of the capital market [17]. Hence, real earnings management reflects the degree of corporate transparency, which is directly related to costs and benefits of the media. Less real earnings management makes the costs to get the company's information lower and benefits are relatively more, so hypothesis 1 is proposed:

Hypothesis 1: The more real earnings management a company uses, the less media attention it draws.

Environmental awareness and behavior of enterprises have become the focus of public attention, and companies release environmental responsibility information through media to gain reputation and disperse nonsystematic risk [18]. Studies have proved that there is a positive relationship between media attention and a company's social responsibility, which can improve its deputy among the public [19-20]. Corporate environmental responsibility is a vital part of CSR. Thus, on the one side, the media reports more on companies performing better environmental responsibility to cater to public attention and expand the scope of the audience. On the other side, making full use of the media's communication effects, these companies actively seek media reports on their superior performance to gain more reputation and obtain development opportunities. In this case, hypothesis 2 is proposed:

Hypothesis 2: The better environmental responsibility a company demonstrates, the more media attention it draws.

Due to ethical and long-run profits, fulfilling CSR restrains real earnings management [10]. Pursuing a good deputy, mandatorily disclosure CSR report can decrease a company's real earnings management [21]. So, it's inferred that due to a strong sense of social responsibility and willingness to gain a good deputy, real earnings management under a strong sense of environmental responsibility is reduced, leading to a more transparent company. The ideal transparency and openness lower the costs to obtain the company's information and draws more attention among the media and public. However, CSR can generate positive moral capital, providing the company with insurance-like protection, which can reduce the negative impact of improper behavior [22]. Wang found that companies release information on environmental responsibility to cover real earnings management [23]. Wan and Liu proved that the better an enterprise develops, the easier it is to cover the behavior of manipulating profits based on real projects [24]. So, under the protection and covering effect of good reputation generated by performing environmental responsibility well, companies may use more real earnings management to show a better performance to stakeholders. Along with the rise in real earnings management, the company's transparency dropped so it becomes harder and more expensive to get its information, then the media pays less attention. Thus, competition hypothesis 3 is proposed:

Hypothesis 3(a): There is a reinforcement interaction of environmental responsibility and real earnings management on media attention.

Hypothesis 3(b): There is an interference interaction of environmental responsibility and real earnings management on media attention.

4. Research Design

4.1 Data Resource and Sample Selection

Chinese A-share listed companies in Shenzhen and Shanghai stock markets from 2014-2018 were selected as initial samples. After eliminating the missing samples and removing the data of listed companies in the financial industry, marked ST or *ST major issues, or whose asset liability ratio is more than 1, 4565 effective samples of 1155 companies were obtained. The environmental responsibility data was manually obtained through the website "Hexun" (http://stockdata.stock.hexun.com/) and media data was manually obtained through the "Baidu news" search engine. The rest of the data are from the database of Tai'an. This study uses stata14.0 for data analysis. All continuous variables are winsorized by 1%.

TABLE 1. Definition of Control Variables

Variables	Variables Descriptions
LEV	Asset liability ratio. Total liabilities / total assets.
ROE	Return on equity. Net profit / average shareholders' equity.
State	Nature of equity. 1 for state-owned companies and 0 for non-state-owned companies.
Size	Size of the company. Natural logarithm of total assets.
Ind	Proportion of independent directors. Number of independent directors / total number of directors.
∑industry	Virtual variables according to the 2012 industry classification standard of China Securities Regulatory Commission.
∑year	The period of sample selection from 2014 to 2018.

TABLE 2. Descriptive Statistics

Variables	Mean	Std. Dev.	Minimum	Maximum
ln_me	3.750	1.217	0	12.899
REM	-0.009	0.270	-7.058	5.774
CER	1.130	4.317	0	30
LEV	0.430	0.198	0.009	0.993
ROE	0.053	0.227	-9.073	1.467
State	0.317	0.466	0	1
Size	22.17	1.114	16.161	26.530
Ind	0.374	0.055	0.25	0.714

4.2 Variable Definition

1) *Explained variable (media attention):* This study uses the natural logarithm of 1 plus the number of news on Baidu news search engine with title containing name of the corresponding company to measure media attention, which is defined as "ln_me", i.e. ln_me = ln(the number of news above + 1).

2) *Explanatory variable (real earnings management):* This paper uses Roychowdhury's model to measure real earnings management. Real earnings management calculated in this way is defined as "REM".

3) *Regulatory variable (corporate environmental responsibility):* Refering to Nan and Sun's approach [25], this paper uses the environmental responsibility score from professional environmental responsibility evaluation report published by Hexun (http://stockdata.stock.hexun.com/) as the measurement index of environmental responsibility. Corporate environmental responsibility is defined as "CER".

4) *Control variables:* Control variables were added to enhance the interpretability of models, whose definition was shown in TABLE 1.

4.3 Descriptive statistics and Model analysis

As is shown in TABLE 2, ln_me varies from 0 to 12.899, and the average is 3.750. This indicates that media attention companies received were generally low with great differences from 2014 to 2018. The average REM is -0.009 and standard deviation is 0.27, which means companies obviously use real earnings management and the using degree varies greatly among companies. The average CER is 1.130, indicating that the performance of environmental responsibility on the whole is relatively poor. Standard deviation of CER reaches 4.317, showing that there is a big difference in corporate social responsibility.

Model (1) and (2) were respectively established to study the relation between real earnings management and media attention and the relation between corporate environmental responsibility and media attention. Model (3) was established to study the moderation effect of corporate environmental responsibility on the relation between real earnings management and media attention.

$$\ln\_me_i = \beta_0 + \beta_1 REM_i + \beta_2 control + \sum Industry + \sum Year + e_i \quad (1)$$

$$\ln\_me_i = \beta_0 + \beta_1 REM_i + \beta_2 CER_i + \beta_3 control + \sum Industry + \sum Year + e_i \quad (2)$$

$$\ln\_me_i = \beta_0 + \beta_1 REM_i + \beta_2 REM_i * CER_i + \beta_3 CER_i + \beta_4 control + \sum Industry + \sum Year + e_i \quad (3)$$

5. Empirical Analysis and Results

TABLE 3 shows regression results of the three models. The variance inflation factor values of each model are less than 2, which indicates that there is no serious multicollinearity problem.

As is shown in results (1), the coefficient of REM and ln_me is significantly negative at 1% significance level, and R-squared is 0.476. The results indicate that the more real earnings management a company uses, the less media attention it draws. Hypothesis 1 is proved and the model has a good explanatory ability. After adding CER in model (2), the coefficient of CER is significantly positive at 5% significance level and R-squared rises to 0.477. Hypothesis 2 is proved and the model explanatory ability is better. Then the interaction term is introduced, which was proved to be negative at 10% significance level, demonstrating that there is a reinforcement interaction of environmental responsibility and real earnings management on media attention. Hypothesis 3(a) is proved. R-squared of model (3) is 0.477 so the model has a good explanatory ability.

TABLE 3. Hierarchical Regression Results of the 3 models

ln_me	result (1)	result (2)	result (3)
REM	-0.202*** (-4.96)	-0.199*** (-4.89)	-0.210*** (-5.10)
REM*CER			-0.023* (-1.88)
CER		0.006** (2.03)	0.005** (1.71)
LEV	0.320*** (4.56)	0.325*** (4.64)	0.325*** (4.64)
ROE	0.017 (0.32)	0.015 (0.28)	0.012 (0.22)
State	-0.207*** (-7.93)	-0.210*** (-8.05)	-0.210*** (-8.04)
Size	0.297*** (24.16)	0.292*** (23.29)	0.292*** (23.30)
Ind	0.470** (2.34)	0.462** (2.30)	0.454** (2.27)
∑Industry	control		
∑year	control		
R-squared	0.476	0.477	0.477

*, **, and *** represent significance at the 10%, 5%, and 1% level, respectively

6. Conclusions

The empirical test results show that more real earnings management reduces media attention while a higher sense of environmental responsibility draws more media attention. Under the joint effect of environmental responsibility, using real earnings management still reduces media attention.

The results for the supervision of earnings management. For the supervision departments, in addition to perfecting the supervision system of earnings management, strengthen the companies' sense of environmental responsibility to govern earnings management also counts. This promotion should be substantial, such as environmental protection construction and investment rather than empty slogans. For the media, actively playing the role of public opinion is an effective way of assessing companies. The media should actively publicize effective environmental protection behaviors of companies, and increase the coverage of corporate environmental responsibility. For the companies, they should practically improve the moral responsibility, reduce the whitewash of financial information and practice the concept of green development.

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