Does the reputation mechanism of media coverage affect earnings management?
Evidence from China

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Abstract

Purpose – This paper aims to investigate the relationship between earnings management and media reports, assess the roles played by the media in determining the reputation mechanism and examine whether the media has an influence on executives' behavior in the case of earnings management.

Design/methodology/approach – This paper uses Chinese A-share listed firms from the period 2008 to 2012 to test the research questions using regression analyses.

Findings – Although the Chinese Stock Markets are still immature compared to those of developed countries, the media seems to play a role in affecting executives' decisions about dabbling in earnings management. Specifically, firms receiving more media attention are more likely to undertake earnings management. Furthermore, negative media reports result in even higher levels of earnings management activities, indicating that managers tend to use earnings management to achieve earnings goals to reduce or relieve the pressure they feel from the media and to remedy any reputation loss. Moreover, the authors have found that firms whose CEOs have higher reputations are more likely to manage earnings and they are more likely to be affected by negative media reports. Similar results were found for state-owned enterprises (SOEs).

Originality/value – This study analyzes how the level and tone of media coverage affect earnings management rather than just assessing the overall effect of media coverage on earnings management. This paper verifies that the reputation mechanism of the media works in China, but it leads to different results than those experienced in developed countries. Reputational benefits have been introduced into the equation for measuring the governance effect of the media to derive a more in-depth analysis of the reputation mechanism. This paper is among the first to link news coverage and state ownership with earnings management.

Keywords Earnings management, Media coverage, CEO reputation, Reputation mechanism

Paper type Research paper

1. Introduction

This study investigates the relationship between earnings management and media coverage by analyzing the media's role in the development of the reputation mechanism and by examining whether the media influences executives' behavior concerning earnings management. The media and the legal system are both external governance mechanisms (Yu *et al.*, 2011). However, compared to developed countries, China, as an emerging and fast-growing economy, still has problems with its legal system that make it an insufficiently effective monitor of managerial behaviors (Qian, 1995; Pistor and Xu, 2005). This makes the role of the media more important in the context of China's stock markets.

According to the agency theory, one of the root causes of earnings management is the conflict of interests that arises between owners and management. Earnings management behavior distorts the pricing function of financial accounting information in capital markets and reflects the failings of corporate governance mechanisms. How to effectively reduce or restrain earnings management is the main focus of current earnings management research. Prior research has shown that the main institutional factor restricting earnings management is the oversight of management exercised via corporate governance by both internal and external governance mechanisms (Liu *et al.*, 2004; Fama, 1980; Saudagaran and Diga, 1997; Wei *et al.*, 2013). Examples of external governance agents include the legal system, the media and stock market regulators (Yu *et al.*, 2011).

There are competing views about how the media affects earnings management. Some argue that the media restrains earnings management (Quan and Wu, 2012; Xu, 2014), while others have shown that the monitoring role played by the media has not worked (Lu, 2013). Yu *et al.* (2011) proposed two competing hypotheses: the supervision hypothesis and the market-pressure hypothesis. They found that the market pressure brought by media attention led to short-sighted managerial behaviors that prompted more earnings management activities. However, they did not examine whether the impacts of the media on earnings management were affected by the reputations of executives due to the media's influence on investors' perceptions of the credibility and competence of management figures. Yu *et al.* (2011) did not examine how the media tone affects earnings management either.

In general, prior studies have found that the media plays a positive role in corporate governance (Dyck *et al.*, 2008; Dyck and Zingales, 2004; Joe *et al.*, 2009; Dyck *et al.*, 2010; Kuhnen and Niessen, 2012; Liu and McConnell, 2013; Dai *et al.*, 2015). However, whether the media can play an important role in the corporate governance of China's stock markets remains largely undecided. A few scholars believe that, in the current Chinese capital markets, the media coverage is not effective at restraining managerial behaviors (He *et al.*, 2008). Others have argued that due to the fact that the current legal system is far from perfect, media outlets play a more important role in corporate governance as alternative investigative overseers (Li and Shen, 2010; Dai *et al.*, 2011; Yang *et al.*, 2014; Zhang and Su, 2015). However, few studies have examined how the governance role of the media actually works with regard to listed Chinese firms.

Dyck *et al.* (2008) and Dai *et al.* (2015) examined the influence of the media on reputational costs and punishments. In developing countries, where the legal protection of investors is relatively weak, it is difficult to rely on the legal system to deter managers' violations of trading rules (Pistor and Xu, 2005; Zheng, 2007). Whether the reputation mechanism of the media is effective in emerging economies, such as China's, is still subject to argument. Li and Shen (2010) suggested that the

reputation mechanism has a very limited influence on managerial decisions in China due to the lack of a mature managerial job market. In China, the majority of listed companies are controlled by the government, and the appointment and promotion of managers of state-owned enterprises (SOEs) are not completely transparent. For managers of private enterprises, the cost of switching between entrepreneurial and professional managerial roles is low. At the same time, the Chinese managerial job market is immature and lacks stability. Therefore, it is difficult for the reputational mechanism underlying the governance effect of the Chinese media to operate effectively (Li and Xu, 2013). Some scholars (Li and Shen, 2010; Yang and Zhao, 2012) have argued that government interventions may increase the punishment costs of violations of regulatory rules and thereby magnify the influence of the media on managerial decisions, forcing managers to stop their violations and minimize the damage caused to investors. By contrast, Dai *et al.* (2011) have suggested that the governance effect of the media is greatly weakened in regions where local government is involved in business. Thus, the higher the degree of local government intervention is, the weaker is the governance effect of the media. Yu *et al.* (2011) suggested that Li and Shen (2010) only examined those companies that had been punished by the government for their illegal actions for their research sample. The representativeness of such a small sample limits the explanatory power of the research findings and, thus, it lacks the ability to explain the governance effects of the media fully.

Thus, the unanswered question is: Does the governance effect of the media rely on government intervention to play its role in China? With the fast growth of the Chinese economy in recent years, as well as the continuous reform of SOEs, and the improvement of the managerial job market, government interventions have decreased over time (Yu *et al.*, 2011). Will the impact of the media on managerial decisions become different henceforth? The conflicting evidence of extant studies and the rapid changes in the economic environment have highlighted the need for a better understanding of the relationship between the reputation mechanism and the governance effect of the media.

In this study, we have attempted to examine the following questions:

- How does the media have an impact on managerial decisions regarding earnings management?

- With the fast development of capital markets and managerial job markets in China, has the reputation mechanism of media started to function?

- How does the influence of the media on earnings management differ between SOEs and non-state-owned enterprises (NSOEs)?

Using A-share companies listed on the Shanghai Stock Exchange from 2008 to 2012, we examined the influence of media coverage on earnings management from the perspective of the reputation mechanism. Our results show that:

- First, the level of earnings management is positively associated with the level of media coverage. The likelihood of earnings management is higher at those companies that receive more media coverage than at those that receive less media coverage.

• Second, compared to non-negative-tone media reports, negative-tone media news has more of an impact on earnings management. Specifically, negative-tone media reports cause a higher level of earnings management.

• Third, the reputation mechanism seems to play an important role in the effect of media coverage on earnings management. The media has more impact on managerial earnings management when the CEO has a higher level of reputation.

• Lastly, the media has more influence on earnings management at SOEs.

This paper contributes to the literature about earnings management and the corporate governance role of the media in the following ways:

• Unlike prior studies, this study focuses on how media coverage affects managerial behaviors proactively, rather than examining whether managers are reactive to certain media reports.

• This study shows that the reputation mechanism of the media is effective in China's Stock Markets. Prior studies have argued that, compared with firms in the developed economies, where the reputation mechanism plays a significant role, Chinese companies see more government interventions, which thereby influence the effect of the media, leaving the effectiveness of the reputation mechanism questionable (Li and Shen, 2010; Yang and Zhao, 2012). Our study provides supporting evidence that the reputation mechanism of media also plays an important role in China's Stock Markets.

• This study introduces reputational benefits into the analysis of the governance effect of media to create a better understanding of how the media impacts earnings management via the reputation mechanism. Prior studies have focused only on the restraint effect of reputational costs on managerial decisions (Dyck *et al.*, 2008; Dyck and Zingales, 2004; Dai *et al.*, 2015).

• This study, however, is among the first to link news coverage, ownership structure and earnings management. Dyck *et al.* (2008) focused on the relationship between media coverage and corporate governance, while Fang *et al.* (2009) discussed the relationship between media coverage and stock returns. In this paper, we have expanded the study of the role of the media in monitoring managerial decisions by investigating the association between media and earnings management and by researching how such associations are affected by state ownership in China.

• This paper also examines the impact made by the tones of media reports on earnings management, which has not been considered before in the extant literature.

The remainder of this paper proceeds as follows. Section 2 develops our hypotheses, and Section 3 presents the data and discusses research methodologies. We then report the results in Section 4 and conclude the paper in Section 5.

2. Theoretical analysis and hypotheses development

2.1 Theoretical analysis

Dyck *et al.* (2008) believed that the managers of listed companies would weigh the pros and cons of their plans before carrying them out. Adopting and applying the model of Dyck *et al.* (2008) to the situation of earnings management, we believe that, on the one hand, a manager may get the private benefits of earnings management by

receiving performance-based compensations, but, on the other hand, he or she may also bear a cost of earnings management, which includes the reputational cost and the punishment cost if they were to be caught cheating. To analyze the likelihood of a firm engaging in earnings management, we transformed the Dyck *et al.* (2008) model into the following formula, suggesting that a manager will be restrained from an earnings management action if, and only if: E (Private benefit of earnings management) < E (Cost of earnings management).

2.1.1 Cost of earnings management. Dyck *et al.* (2008) discussed how the media has an impact on the cost of a manager's actions. Following their model, we believe that the cost of earnings management can be expressed as the following:

$$
\begin{aligned}
\text{E (Cost of earnings management)} &= \text{E (Reputation cost)} + \text{E (Punishment)} \\
&= \sum_i P_i \times RC_i + \pi P
\end{aligned}
\tag{1}
$$

The reputational cost of earnings management can be expressed by $\Sigma_i P_i \times RC_i + \pi P$, where P_i is the probability that group i will receive the news about a manager's action and will believe it, RC_i is the reputational cost of the action *vis-à-vis* group i which forms a negative perception of the behavior of the manager. The punishment cost of earnings management can be expressed by πP, where π is the probability of enforcement, and P is the punishment in the case of enforcement.

Considering the legal environment in China, we believe that the punishment cost of earnings management is different from that in developed countries. Dyck *et al.* (2008) referred to a penalty cost as the legal cost exacted due to managers' violations of regulations. In China, due to the lack of enforcement and the ineffectiveness of securities laws, relying on laws only to punish the illegal actions of managers would be neither effective nor efficient (Pistor and Xu, 2005). It is necessary for us to consider the impacts of other alternatives such as punishments made by the government. The punishment costs levied by the government include persuasion, public criticism, fines, the revocation of employment contracts, demotion and dismissal (Li and Shen, 2010). We have used $\pi 1 P1$ to represent the punishment cost of government responses (also referred to as an administrative cost), and we have used $\pi 2 P2$ to represent punishment under the law (also referred to as a legal cost). We then expressed the cost of earnings management as follows:

$$
\begin{aligned}
\text{E (Cost of earnings management)} &= \text{E (Reputational cost)} + \text{E (Punishment)} \\
&= \text{E (Reputational cost)} + \text{E (Punishment of law)} \\
&\quad + \text{E(Punishment of government)} \\
&= \sum_i P_i \times RC_i + \pi P \\
&= \sum_i P_i \times RC_i + \pi 1 P1 + \pi 2 P2
\end{aligned}
\tag{2}
$$

2.1.2 Private benefit of earnings management. The private benefits for managers of manipulating earnings include the following: performance-based compensations, gains from the capital market (Graham *et al.*, 2005), a reduced likelihood of dismissal (Weisbach, 1988), the promotion opportunities opened up due to good performance (Cao

et al., 2011) and a reputational gain brought about by meeting the market's expectations. In summary, the private benefit of undertaking earnings management can be expressed as:

$$\begin{aligned}
&E(\text{Private benefit of earnings management}) \\
&= E(\text{Reputational benefit}) + E(\text{Compensation benefit}) \\
&+ E(\text{Capital gain on stockmarkets})
\end{aligned} \tag{3}$$

Yu *et al.* (2011) believed that the reputation mechanism does not work in China. However, they did not consider the impacts of reputational benefits brought about by meeting the market's expectations. Using the same approach deployed for the analysis of reputational cost, we used $\Sigma_i P_i * RB_i$ to represent the reputational benefit, where P_i is the probability that group i will receive the news about a manager's action and will believe it, RB_i is the reputational benefit of the action *vis-à-vis* group i which forms a positive perception of the behavior of the manager due to their capacity for meeting the market's expectations.

As discussed above, the compensation benefits include performance-based compensation, increased job security and promotion opportunities. For the convenience of analysis, we aggregated these benefits and used C to represent the compensation benefit accrued when managers help firms to reach certain earnings goals.

Besides compensation benefits, managers may also make tangible capital gains due to the increase of their firms' stock prices if they hold shares in the company. Following Yu *et al.* (2011), we used the function of expected stock price (S) and stock price volatility (δ) to represent the capital gain, and that is $f(\delta S)$.

Overall, based on the above analyses of the costs and benefits of earnings management, we believe that a manager would give up an earnings management action if, and only if, the cost of undertaking earnings management outweighed the benefits obtained. We used the following formula (4) to express this:

If

$$\sum_i P_i \times RB_i + C + f(\delta S) < \sum_i P_i \times RC_i + \pi 1 P 1 + \pi 2 P 2,$$

then abandon the earnings management action $\qquad$ (4)

2.1.3 Impacts of media on the costs and benefits of earnings management. Based on formula (4), we will discuss the impacts of media on the costs and benefits of earnings management. The essential characteristic of the media is its quick dissemination of information. The media makes more people aware of a manager's actions or his/her achievements, which in turn affects P_i in formula (4).

Similarly, both RB_i and RC_i can also be influenced by media coverage. Dyck *et al.* (2008) believed that the media affects public knowledge in two ways. One is by spinning the news, while the other is by creating common knowledge, thereby affecting the reputational costs and benefits for managers. For instance, when a manager's illegal action becomes public knowledge and is criticized by the news press, the politicians, who were not to blame for the violations at first, feel obligated to condemn the violation to dissociate themselves from these managers and their violations of rules, which increases managers' reputational costs.

II, the probability of enforcement, can also be influenced by the media. Media reports increase public attention. The attentions paid by politicians to violations will increase the likelihood of enforcement. Dyck *et al.* (2008) explained how such an impact came from three places: politicians care for voters; the media's ability to change the "rational apathy" of the public, reducing the power of vested interests; and politicians care not only for their reputations *vis-à-vis* voters, but also for their reputations *vis-à-vis* foreign countries. Li and Shen (2010) also insisted that media coverage increases the attention of regulators to violations.

As for the sizes of *P*1 and *P*2, i.e. punishment by the government and regulatory laws, they can be influenced by both the level of media coverage and the tone of the media reports. Media coverage can influence a jury's final verdict by impacting its mood. The public attention paid to a case, brought about by media coverage may also affect the final verdict passed about a manager's illegal actions. It is also true that whenever the regulator has any discretion in the size of a punishment, he or she will most likely consider his or her reputation *vis-à-vis* the public.

Furthermore, the volatility of stock price, δ, and the expected stock price, *S*, can both be influenced by media coverage. Vega (2006) discovered that reports by the media on stock performance led to fluctuations in stock prices. When the tone of the media coverage on the stock value is positive, the stock price does not obviously change, but when the media coverage of the stock is negative, the stock price will fall dramatically. He attributed these findings to investors' excessive or inadequate responses to media coverage. Vega (2006) also found that the media increased the pressure for the overbuying and selling of stocks on capital markets. Moreover, the media affected the public's expectations for stock price, *S*, (Fang and Peress, 2009).

Overall, we can see that the media affects both the benefits of earnings management through its influences on δ, *S*, P_i, RB_i and also the costs of earnings management through its influences on P_i, RC_i, π and *P*. If the media has more impact on the benefits of earnings management than on the costs, it will create more incentives for managers to engage in earnings management.

To organize our hypothesis development better, we classified the parameters that affect the governance effects of the media into four sub-mechanisms. For the cost side, we will discuss the impacts of two mechanisms: the reputational cost mechanism, affecting P_i and RC_i, and the punishment mechanism, affecting π and *P*. For the benefit side, we have discussed the impacts of reputational benefits, affecting P_i and RB_i, and the market mechanism, affecting δ and *S*. We then grouped the discussions of reputational costs and reputational benefits together as one mechanism: the reputational mechanism.

2.2 Hypothesis development

The extant research has found that reports of poor financial performance often lead to significant capital losses for companies listed on stock markets. The attention paid to listed companies by the media puts additional pressure on managers to meet the market's expectations. To meet such expectations, managers may take a series of actions to improve a firm's financial performance, so as to maximize their private benefits. However, real improvements in financial health take long periods of time and tremendous amounts of effort to realize. As a short-cut alternative, managers may risk using earnings management to achieve earnings goals. In China, where there is a weaker

institutional environment compared to those in developed economies, the benefits of earnings management could be significantly greater than the costs of earnings management, and the media may exacerbate that situation.

   2.2.1 The impact of reputational mechanism. Following Dyck *et al.* (2008), we will analyze the impacts of the reputational mechanism from three aspects:

   (1) managers' reputations *vis-à-vis* potential employers, which determines the competitiveness of managers in managerial job markets;

   (2) managers' reputations *vis-à-vis* financial markets, which affects the costs of future financing; and

   (3) managers' reputations *vis-à-vis* society, which could be of concern for managers' prestige and self-esteem.

On the one hand, reputational benefits (RB_i) increase with an increase in media coverage. In China, the majority of listed firms are controlled by the government. The CEOs of SOEs pay a great deal of attention not just to monetary compensation but also to opportunities for political promotions. When appointing and promoting managers, the government, as the largest owner of state-owned companies, has focused on using financial performance measures to assess the performance of managers (Cao *et al.*, 2011; Kato and Long, 2006). At the same time, the managers of SOEs have to pay close attention to their public images and reputations, which are often influenced by the tone of media coverage. Once managers of SOEs help their firms achieve their earnings goals, they will benefit from increased reputations for effectiveness and be liable to receive more opportunities for political promotion. Media coverage further increases such benefits for management figures by spreading the "good news" of their firms' successes.

   On the other hand, reputational costs (RC_i) also increase with increases in media coverage. Engaging in earnings management is done at the risk of being caught by external governance mechanisms such as auditors and regulators and, thereafter, they get revealed by the media. Once earnings management is uncovered, managers may suffer significant losses both in terms of their tangible capital and personal reputations and, at the same time, they may lose promotion opportunities (Liao and Zhang, 2012) and face severe punishments.

   Facing both the costs and benefits of earnings management, how do managers decide on a course of action? After examining the relationship between CEOs' reputations and earnings management, Jennifer *et al.* (2008) found that the higher the reputation of the CEO, the higher was the extent of their earnings management. They believed that the more reputed CEOs were, the more likely they were to manage earnings to meet the high expectations of the market for earnings growth, such that they obtained additional benefits from maintaining their high reputation. We believe that, in China, the impact of the media on reputational benefits is greater than that on reputational costs for managers and will explain this below.

   For managers of SOEs, the reputational cost of earnings management may be small. First, SOEs find it easier to get bank loans than NSOEs (Liu and Lu, 2007) due to support from the government. For this reason, SOEs are not normally concerned with financing resources and costs even when the company suffers damage to its reputation caused by the media. Second, a good performance and subsequent

reputation gain brought about by earnings management will result in managers getting more opportunities for political promotion, which will have a huge impact on their future careers as managers. By comparison, the cost of reputation loss caused by the exposure of earnings management by the news media seems much smaller compared to the potential benefits brought about by political promotion. The extant literature has tended to find that managers of SOEs whose earnings management actions have been exposed have not suffered significant financial losses, nor did they tend to be demoted, as most of them were simply shuffled along to similar positions in other companies (Wang, 2001).

For managers of private enterprises, due to the immature managerial job market, the cost of switching between being entrepreneurial and professional managers is rather low (Li and Xu, 2013). Thus, even if earnings management action is exposed by the media, managers can still find jobs or start their own businesses. By contrast, if they meet the market's expectations for earnings by managing earnings, they will get bonuses and promotion opportunities. Moreover, private enterprises are under more pressure to manage earnings to obtain loans from banks.

Based on the above analyses, we believe that the reputational benefits brought by earnings management are far greater than the reputational costs for managers of Chinese listed firms, and the media, through its quick dissemination of firms' news and its tone in interpreting their results, will exacerbate this situation.

2.2.2 The impact of market mechanism. One major motivation for executives to engage in earnings management in developed economies is for them to obtain tangible capital gains through compensation and the increasing value of their firms' stocks in capital markets. Because of the imperfection of the current managerial job market in China, the compensation incentive is relatively small for managers of Chinese listed firms, while the incentive to meet regulatory requirements for initial public offerings and to sustain qualifications as listed firms are very strong. A listed firm in China is an important shell resource. Once a firm goes public, its value will increase significantly, and it will raise a large amount of money from the public offering. As a result, the controlling shareholders and managers may use a variety of means to tunnel and embezzle assets from listed companies to obtain huge private benefits. To get the approval of regulators for initiating public offerings, a company has to meet certain earnings thresholds set by the regulators. Even after being listed, a firm has to avoid consecutive years of net losses to prevent its delisting. For these reasons, many Chinese companies tend to use earnings management to achieve their earnings thresholds or to avoid losses (Wang and Wu, 2011)[1].

In Chinese Stock Markets, the majority of investors are individuals, who have less expertise and are more short-sighted when compared with other types of investors such as institutions. Individuals are often more subject to bandwagon effects, and therefore are easily affected by media reports and the media's tone, making expected stock prices highly dependent on media reports. If a manager meets investors' expectations for a firm's financial performance, he or she will benefit hugely in terms of capital gains. The media exacerbates such situations by its quick dissemination of earnings news and through its interpretations of and speculations about results.

2.2.3 The impact of punishment mechanism. As discussed previously, earnings management is done at the risk of incurring punishment costs, including both legal

costs and administrative costs, and media coverage will increase the size of punishment costs. Below we will analyze the impacts of both costs, as described by formula (4):

- *Legal costs* ($\pi 2\ P2$): In an emerging market like China, the protection of the interests of investors by the legal system is still limited, making it unlikely that all of those managers who engage in earnings management will be punished by lawsuits. Although the situation has been improving over time, thanks to continuing market-oriented reforms and the improvement of the legal environment, the punishment costs brought by lawsuits are still not reflective of all the transgressions that occur in the Chinese Stock Markets, making legal costs less significant than the other key category of punishment costs – administrative costs.

- *Administrative costs* ($\pi 1\ P1$): Li and Shen (2010) argued that media coverage can lead to drawing the attention and prompting the intervention of the government with respect to the illegal actions of managers, thereby increasing the likelihood of the punishment of those managers by the government.

From the perspective of the punishment mechanism, despite the fact that media coverage increases the likelihood and the sizes of punishments for managerial earnings management behavior, the weaknesses in the Chinese legal systems and the lack of rigor in enforcement give managers the chance to escape from punishment or to suffer only small financial losses, even when the media has reported illegal behavior. While media reports have disseminated the news to regulators, the number of companies that have been punished by the government is still small, leaving numerous illegal activities to go unnoticed or be ignored by regulators (Yu *et al.*, 2011).

Overall, the impacts of media coverage on earnings management are twofold. On the one hand, it may increase the cost of earnings management but, on the other hand, it may increase the benefits. With that said, considering the current legal environment in China, we believe that:

- Although the exposure of earnings management may bring about reputational costs and thereafter punishment costs, when compared to the huge benefits of earnings management, the costs of earnings management are much smaller than its benefits.

- Media coverage has exacerbated this situation where the benefits outweigh the costs of earnings management, which can be analyzed from three perspectives, i.e. the reputation mechanism, market mechanism and punishment mechanism. First, the increased reputational benefits of media coverage exceed the costs of reputation loss. Second, due to the immaturity of China's capital markets, minority shareholders are easier influenced by media reports, leading to high volatility on the stock markets, and the media's attentions and its tone when disseminating earnings news tend to make this situation worse. Once a firm's earnings meet the investors' expectations, its managers can make great capital gains. Third, while the media may expose cases of earnings management to regulators, the number of companies who have been punished by the government is still small, giving managers the perception that they will not face penalties or will only suffer small losses even when their earnings management behaviors have been uncovered and exposed. Therefore, when under

pressure to reach earnings goals, managers are more likely to use earnings management.

Besides the level of media coverage, the tone of the media can also have significant impacts on the public's perception of managers' integrity and competence, thereby affecting managers' decisions. When the media disseminate negative reports about a listed firm, its managers may manage earnings further to demonstrate good performance to recover from their previous reputation loss. Yu *et al.* (2011) discovered that the more media attention there is, the more likely it is that management hides bad news, as they have no motivations to hide good news. For these reasons, we propose the following two hypotheses:

H1a. Media coverage increases the likelihood of earnings management.

H1b. Compared with non-negative reports, negative media reports are more likely to lead to earnings management.

Dai *et al.* (2015) believed that the disciplinary power of the media is stronger in firms where insiders' personal wealth is closely tied with the firm's value. In developed countries, the media helps constrain illegal actions, but in China, as has been analyzed previously, we believe that the reputational benefits of earnings management are far greater than the reputational costs of earnings management, and the media coverage amplifies such differences. Jennifer *et al.* (2008) also argued that the more reputed CEOs are, the more likely they are to manage earnings to meet the high expectations of the market. Furthermore, when facing the media, and especially the negative reports of the media, the pressure will be greater for more reputed CEOs to take action to rebuild their public images and reputations, which can be done through the fulfillment of earnings goals. Therefore, we propose the following hypotheses:

H2a. More reputed CEOs are more likely to engage in earnings management than less reputed CEOs.

H2b. The media has more impact on more reputed CEOs, and thereby increases the likelihood of earnings management in the firms with which they are associated.

H2c. Compared with non-negative reports, negative media reports are more likely to lead to earnings management by more reputed CEOs' firms.

A majority of the A-share listed firms in China are SOEs. They are normally bigger in size and have more complex administrative systems, and so it is difficult for the government, as the ultimate shareholder, to oversee managers and monitor the daily operations of SOEs. In the administrative systems of the Chinese government, different levels of government are responsible for the oversight of different industries and areas. Higher-ranked administrative agencies do not oversee lower-ranked enterprises which are monitored instead by subordinate governmental agencies. When there is collusion between local officials and managers, the chain of the governance mechanism will be broken.

In addition, a CEO of an SOE often holds a political position, and therefore he/she is not just an executive but also a politician whose interests are often more focused on political promotion opportunities. A rapid improvement in firms' financial

performances provides CEOs with more opportunities for political promotions. Therefore, CEOs could be more short-sighted and make myopic decisions to engage in earnings management. By contrast, CEOs of NSOEs pay more attention to their social reputations and are more cautious about earnings management activities.

Previous studies show that in an environment of less-developed markets and more concentrated capital, it is more likely for the management to obtain greater private benefits (Dyck and Zingales, 2004). The ownership of SOEs in China is highly concentrated, and managers can obtain more private benefits from earnings management than can the managers of NSOEs.

In addition, Wang and Wu (2011) found that companies with a poorer quality of earnings are more likely to be associated with lower levels of profitability and with state-controlled ownership. Managers of SOEs are appointed by the government rather than chosen by the market. These managers are often selected from a cadre of officials holding political positions. Bureaucrats have the authority to appoint managers but do not need to bear any responsibility for the consequences of bad appointments. Thus, they lack the pressures or incentives to motivate or oversee managers. Therefore, managers of SOEs will take the risk of manipulating earnings to serve their self-interests. Such a situation will be worsened when a management faces negative media reports about their firms. To reduce the damage done to their reputations and avoid the risk of losing promotion opportunities, it is important for them to demonstrate good financial performance to rebuild the confidence of the government in them.

Based on above analyses, we propose the following hypotheses:

H3a. Media reports have a more significant impact on earnings management at SOEs than at NSOEs.

H3b. Compared with non-negative reports, negative media reports have a more significant impact on earnings management at SOEs.

3. Data and methodology
3.1 Sample selection and data description
Our empirical investigation was based on a sample of A-share companies listed on the Shanghai Stock Exchange from 2008 and 2012. The sample was selected by excluding the following companies:

- companies in the financial and insurance industry, because of the uniqueness of this industry in terms of its operations and accounting policies;
- companies that belonged to an industry that had fewer than 15 listed companies; and
- companies that had missing data.

All financial data were obtained from the China Stock Market and Accounting Research (CSMAR) database. The data of media coverage were collected manually by reading the Newspaper Special column of the China National Knowledge Infrastructure (CNKI).

In the end, we had 2,556 qualified observations in our sample, representing firms in 11 industries. Table I outlines the sample selection process:

3.2 Methodology
3.2.1 Measure of earnings management. For this paper, we used the modified Jones model to estimate discretionary accruals as the proxy for earnings management. Prior research has proposed a variety of models to measure earnings management. The modified Jones model has been widely accepted and used in prior literature about earnings management (Dechow *et al.*, 1995; Bartov *et al.*, 2000). Recent literature has also used many improved models to measure discretionary accruals, such as the performance-adjusted Jones model (Kothari *et al.*, 2005; Chan *et al.*, 2015). However, scholars who have examined the Chinese capital markets have found that the modified Jones model has the best explanatory power for Chinese markets compared to other models (Xia, 2003; Huang and Xia, 2009).

The processes to calculate discretionary accruals using the modified Jones model are shown as follows:

The model for estimating non-discretionary accruals (NDA) is as follows:

$$NDA_{it} = \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2 \left[\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right] + \alpha_3 \left(PPE_{i,t}/A_{i,t-1} \right) \qquad (5)$$

where, NDA_{it} is non-discretionary accruals, $A_{i,t-1}$ represents the total assets in year $t-1$, $\Delta REV_{i,t}$ is the change in sales revenues, $\Delta REC_{i,t}$ is the change in accounts receivables and $PPE_{i,t}$ is the gross property, plant and equipment. Then α_1, α_2, α_3 can be estimated from the following model cross-sectionally for industry-years with at least 15 observations:

$$\frac{TA_{i,t}}{A_{i,t-1}} = a_1 \left(\frac{1}{A_{i,t-1}} \right) + a_2 \left(\frac{\Delta REV_{i,t}}{A_{i,t-1}} \right) + a_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t} \qquad (6)$$

where α_1, α_2, α_3 are the ordinary least squares (OLS) estimated values of α_1, α_2, α_3; $TA_{i,t}$ is the total accruals in year t measured by the difference between *EBXI* and *CFO*, where *EBXI* is the earnings before extraordinary items and discontinued operations; and *CFO* is the operating cash flows.

Discretionary accruals are calculated as the difference between total accruals and NDAs. That is:

$$DA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - NDA_{i,t} \qquad (7)$$

Year	2008	2009	2010	2011	2012	Total
Number of observations	868	891	912	900	880	4,451
Less: firms in financial and insurance industry	(23)	(26)	(28)	(28)	(28)	(133)
Less: firms in an industry* that has fewer than 15 listed companies	(31)	(32)	(34)	(32)	(30)	(159)
Less: firms with missing data	(329)	(312)	(336)	(321)	(305)	(1,603)
Final sample	485	521	515	518	517	2,556

Note: *The industry that had fewer than 15 listed firms was the communication and cultural industry

Table I.
Sample selection
process

3.2.2 Media measures and coding process. We used three variables to proxy media coverage: the total number of news releases (media1), the number of negative news releases (media2) and the number of non-negative news releases (media3). We then took the natural logarithm of the sum of the number of news releases plus 1 to decide the value of media variables, and used Media1, Media2 and Media3 to represent the value of the natural logarithm of the number of pieces of news coverage respectively.

Media1 was the number of news releases in 14 newspapers which have large circulations and are considered to be the main financial media in China, including *China Securities News*, *Shanghai Securities News*, *Securities Daily*, *Securities Times*, *Twenty-first Century Economic Report*, *First Financial Daily*, *Economic Observer*, *China Business News*, *China Times*, *Financial Times*, *Economic Daily*, *China Economic Times*, *Financial Times* and *Economic Information Daily*. Among them, *Securities Daily*, *Securities Times* and *China Securities News* are designated by the China Securities Regulatory Commission (CSRC) to disclose the information of listed companies. We did not consider the news from a financial websites and financial journals based online for the following reasons: a majority of internet news comes from newspapers and usually lags behind newspapers in reporting. We obtained data of media reports in the 14 newspapers from the Newspaper Special column of the CNKI.

We searched the news by firm names in the 14 newspapers. We also searched the news by title and theme. An article was counted into the number of news items about a firm when the firm's name was cited more frequently than other firms in a news article.

Media2 represents the number of negative media reports. How to differentiate negative reports from other reports was a key issue for our data collection. You and Wu (2012) proposed that the most recognized method of distinguishing negative news was via textual analysis. The method was also divided into a computer identification method and a manual reading method. The computer identification method used a computer to count the frequency of negative words. Despite the higher efficiency of this method, it suffered from lower effectiveness at identifying the negative tone of media reports. It was difficult to rely on computer programs to distinguish negative news solely by using negative keyword searches. Therefore, we used the manual method, whereby we read news to determine whether it was negatively reported (You and Wu, 2012; Cu and Li, 2012; Shen and Li, 2010). We read all related articles and searched for negative keywords in the title and text to determine the tone of the news. We referred to the optimal negative keywords which were used to distinguish negative reports by Yu *et al.* (2011) and Zheng (2011) in our searches.

3.2.3 CEO reputation measure. We used the number of news releases containing a CEO's name that appeared in the 14 main newspapers to proxy for CEO reputation. The natural logarithm of (the number of news releases related to CEO plus 1) was used as the variable for our empirical analyses, and was represented by REP. The higher the REP, the higher was a CEO's reputation. Prior studies have also used different measures of CEO reputation, including social prestige (Blau and Duncan, 1967), educational background (Hauser and Warren, 1997), corporate social responsibility reports (Dai *et al.*, 2015) and compensation (Rajgopal *et al.*, 2006). Jennifer *et al.* (2008) studied the relationship between CEO reputation and earnings

quality. They used the number of news releases related to a CEO to proxy for CEO reputation. Milbourn (2003) also used the same measure to proxy CEO reputation in his research related to the relationship between CEO reputation and CEO compensation. Jennifer *et al.* (2008) proposed three reasons to support their choice:

(1) the tone was favorable toward the CEO, 95 per cent of the time;

(2) the number of articles was correlated with CEOs appointed from outside the firm, a proxy for reputation used by Milbourn (2003) and Rajgopal *et al.* (2006); and

(3) the number of articles was highly correlated with explicit recognition of the CEO by the "top CEO" lists compiled by various sources.

They then conducted three validation checks to ensure that the number of news articles was not merely a reflection of CEO infamy as opposed to reputation. The results generally supported the use of press coverage as a measure of CEO reputation.

Following Jennifer *et al.* (2008), we used the number of news releases containing the CEO's name to measure CEO reputation. We obtained the number of news releases containing the CEO's name by searching the keywords of "CEO" or "Chairman", then reading the articles directly to make a final judgment. To avoid multicollinearity, we used a dummy variable *HREP* in our empirical analyses, which equaled 1 if the value of CEO reputation was greater than the mean value of all CEOs' reputation scores, and 0 otherwise.

3.2.4 Ownership measure. Consistent with the extant literature, we divided enterprises into SOEs and NSOEs based on the identities of firms' ultimate shareholders, which equaled 1 if a firm was an SOE and 0 otherwise.

3.2.5 Control variables. Following Chan *et al.* (2015) and Zang (2012), we chose the following variables as the control variables for earnings management: *ROA* was net income divided by year-end total assets, *LEV* was the total liabilities divided by total assets, *Growth* was the ratio of sales growth in year *t*, *Size* was the natural log of total assets and *M/B* was the market-to-book ratio. We also used *Big10* as a control variable that proxied for the costs related to accruals manipulation. *Big10* was a dummy variable, which equaled 1 if the company was audited by one of the ten biggest certified public accounting (CPA) firms in the Chinese market, and 0 otherwise. We expected that *Big10* was negatively related to discretionary accruals because managers are less likely to use accruals manipulation when they face more rigorous examinations by external auditors (Chan *et al.*, 2015).

Next, we included *Duality*, *Indep* and *Age* to measure a firm's corporate governance. *Duality* was a dummy variable, which equaled 1 if a firm's chairman and CEO were the same person, and 0 otherwise. *Indep* was the proxy for board independence, which was determined by the proportion of the number of independent members of the board of directors (BOD). We expected that *Indep* was negatively related to discretionary accruals. *Age* represented the CEO's age. Jennifer *et al.* (2008) suggested that age was an important factor influencing CEOs' reputations and earnings management. We predicted that *Age* was negatively related to discretionary accruals because the older CEO was likely to be more conservative when making decisions.

Besides the above variables, we also included year-dummies and industry-dummies to control for year effects and industry effects. The definitions of variables are described in Table II.

3.3 Regression models
To investigate whether the reputation mechanism of media coverage affected earnings management, we developed the following models:

Variables	Acronym	Definition
A. Earnings management variable		
Earnings management	|DA|	The absolute value of discretionary accruals using modified Jones model (Jones, 1991)
B. Media variables[a]		
Media coverage	Media1	Log(1 + Number of total news releases at year $t-1$)
Negative media coverage	Media2	Log(1 + Number of negative news releases at year $t-1$)
Non-negative news	Media3	Log(1 + Number of non-negative news releases at year $t-1$)
C. Reputation variables		
CEO reputation	*REP*	Number of news releases containing the CEO's name at year $t-1$
High CEO reputation	*HREP*	Dummy variable, which equals 1 if the value of CEO reputation is greater than the mean, and 0 otherwise.
D. Ownership variables		
State-owned enterprise	SOE	Dummy variable, which equals 1 if a firm is an SOE and 0 otherwise
E. Control variables		
Return on assets ratio	*ROA*	Net income divided by year-end total assets
Leverage ratio	*LEV*	Year-end total liability divided by year-end total assets
Sales growth	*Growth*	(Total sales of year t divided by total sales of year $t-1$) -1
Firm size	*Size*	The natural logarithm of year-end total assets
Market-to-book ratio	*MB*	Market value divided by book value
CEO duality	*Duality*	Dummy variable, which equals 1 if a firm's chairman and CEO is the same person, and 0 otherwise
Independence of BOD	*Indep*	The proportion of the number of independent directors on the board of directors
CEO age	*Age*	CEO's age
Big10 auditors	*Big10*	Dummy variable, which equals to 1 if the company is audited by one of the big ten CPA firms in the Chinese market, and 0 otherwise
Year	*Year*	Year dummy
Industry[b]	*IND*	Industry dummy

Notes: [a] To control the endogenous problem, we considered all media variables as a lagging indicator and used media coverage in year $t-1$ in the regression analyses; [b] the industry classification codes were obtained from Listing Corporation Industry Classification Guidelines (2001 Edition), published by the CSRC; there were 11 industries after we had excluded the finance and insurance industry and those industries which had fewer than 15 firms

Table II.
Definition of variables

$$|DA|_{i,t} = \beta_0 + \beta_1\, Media1_{i,t-1} + \beta_2\, HREP_{i,t-1} + \beta_3\, SOE_{i,t-1}$$
$$+ \beta_4\, Media1_{i,t-1} \times HREP_{i,t-1} + \beta_5\, Media1_{i,t-1} \times SOE_{i,t-1}$$
$$+ \beta_6\, HREP_{i,t-1} \times SOE_{i,t-1} + \beta_7\, ROA_{i,t} + \beta_8\, LEV_{i,t} + \beta_9\, Growth_{i,t}$$
$$+ \beta_{10}\, Size_{i,t} + \beta_{11}\, MB_{i,t} + \beta_{12}\, Duality_{i,t} + \beta_{13}\, Indep_{i,t} \qquad (8)$$
$$+ \beta_{14}\, Age_{i,t} + \beta_{15}\, Big10_{i,t} + \sum \delta_i\, YEAR_i + \sum \theta_j IND_j + \varepsilon_{i,t}\, A$$

$$|DA|_{i,t} = \beta_0 + \beta_1\, Media2_{i,t-1} + \beta_2\, HREP_{i,t-1} + \beta_3\, SOE_{i,t-1} + \beta_4\, Media2_{i,t-1}$$
$$+ HREP_{i,t-1} + \beta_5\, Media2_{i,t-1} \times SOE_{i,t-1} + \beta_6\, HREP_{i,t-1} \times SOE_{i,t-1}$$
$$+ \beta_7\, ROA_{i,t} + \beta_8\, LEV_{i,t} + \beta_9\, Growth_{i,t} + \beta_{10}\, Size_{i,t} + \beta_{11}\, MB_{i,t}$$
$$+ \beta_{12} Duality_{i,t} + \beta_{13}\, Indep_{i,t} + \beta_{14}\, Age_{i,t} + \beta_{15}\, Big10_{i,t} \qquad (9)$$
$$+ \sum \delta_i YEAR_i + \sum \theta_j IND_j + \varepsilon_{i,t}$$

$$|DA|_{i,t} = \beta_0 + \beta_1\, Media2_{i,t-1} + \beta_2\, Media3_{i,t-1} + \beta_3\, HREP_{i,t-1} + \beta_4\, SOE_{i,t-1}$$
$$+ \beta_5\, Media\,2_{i,t-1} \times HREP_{i,t-1} + \beta_6\, Media\,2_{i,t-1} \times SOE_{i,t-1}$$
$$+ \beta_7\, Media\,3_{i,t-1} \times HREP_{i,t-1} + \beta_8\, Media\,3_{i,t-1} \times SOE_{i,t-1}$$
$$+ \beta_9\, HREP_{i,t-1} \times SOE_{i,t-1} + \beta_{10}\, ROA_{i,t} + \beta_{11}\, LEV_{i,t} + \beta_9\, Growth_{i,t}$$
$$+ \beta_{12}\, Size_{i,t} + \beta_{13}\, MB_{i,t} + \beta_{14}\, Duality_{i,t} + \beta_{15}\, Indep_{i,t} + \beta_{16}\, Age_{i,t} \qquad (10)$$
$$+ \beta_{17}\, Big10_{i,t} + \sum \delta_i YEAR_i + \sum \theta_j\, IND_j + \varepsilon_{i,t}$$

4. Results
To avoid the distortions caused by extreme values on the empirical results, we winsorized all independent variables in the top and bottom 1 per cent, so that these variables were normally distributed within reasonable ranges.

4.1 Summary statistics of variables
Panel A of Table III reports the summary statistics of all variables. We can see that the mean value of $|DA|$ was 0.065. From the table, the values of Media1 (maximum = 1.643, minimum = 0 and mean = 0.682) showed that the media's attention on each listed company varied. Some companies had never been reported by the media during the year. The values of Media2 (median = 0 and mean = 0.023) showed that only a few companies had received negative reports from the media.

For the convenience of interpretation, we have presented the original numbers of media reports in Panel B of Table III. The annual average of the number of media reports was 6.587 and the average number for negative media reports was 0.139, which tells us that the number of negative media reports about China's listed companies was generally small. The results for the annual average number of media reports about CEOs (REP mean = 1.227, median = 0, maximum = 15 and minimum = 0) indicated that media coverage about the CEOs of listed companies varied amongst firms. Some CEOs received much more attention from the media than others.

Variable	N	Mean	STD	Minimum	Maximum	25 (%)	50 (%)	75 (%)
Panel A: summary statistics								
|DA|	2,556	0.065	0.068	0.001	0.382	0.020	0.044	0.085
Media1	2,556	0.682	0.405	0.000	1.643	0.301	0.699	0.954
Media2	2,556	0.023	0.103	0.000	0.602	0.000	0.000	0.000
Media3	2,556	1.552	0.934	0.000	3.784	0.693	1.609	2.197
HREP	2,556	0.241	0.428	0.000	1.000	0.000	0.000	0.000
SOE	2,556	0.708	0.455	0.000	1.000	0.000	1.000	1.000
Age	2,556	52.174	6.571	38.000	69.000	47.000	52.000	57.000
LEV	2,556	0.450	0.209	0.027	0.943	0.295	0.459	0.606
ROA	2,556	0.038	0.057	−0.156	0.227	0.009	0.030	0.063
Growth	2,556	0.894	4.504	−1.017	38.938	−0.112	0.073	0.385
Size	2,556	22.115	1.235	19.641	25.768	21.237	21.952	22.881
MB	2,556	1.902	1.122	0.917	7.138	1.180	1.534	2.149
Duality	2,556	0.012	0.109	0.000	1.000	0.000	0.000	0.000
Indep	2,556	0.364	0.050	0.286	0.556	0.333	0.333	0.375
Big10	2,556	0.387	0.487	0.000	1.000	0.000	0.000	1.000

		Media1		Media2		Media3		REP	
	N	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel B: media coverage and CEO reputation by year									
2008	485	10.023	6	0.208	0	9.814	6	1.608	0
2009	521	8.098	5	0.129	0	7.969	5	1.503	1
2010	515	5.499	3	0.087	0	5.412	3	1.105	0
2011	518	4.174	2	0.133	0	4.041	2	0.956	0
2012	517	5.344	3	0.143	0	5.201	3	0.985	0
Total	2556	6.587	4	0.139	0	6.448	4	1.227	0
Panel C: media coverage and CEO reputation by industry									
A	55	5.873	5	0.255	0	5.618	4	1.364	1
B	58	14.552	8	0.690	0	13.862	8	2.914	1
C	1359	6.361	4	0.106	0	6.255	3	1.266	0
D	134	7.634	4	0.097	0	7.537	4	0.754	0
E	72	11.444	6	0.972	0	10.472	6	1.528	1
F	147	7.898	5	0.075	0	7.823	5	1.109	0
G	169	4.426	3	0.041	0	4.385	3	0.970	0
H	207	4.947	3	0.097	0	4.850	3	0.976	0
J	131	7.740	4	0.076	0	7.664	4	1.618	1
K	82	5.207	3	0.085	0	5.122	3	0.720	0
M	142	5.662	4	0.141	0	5.521	3	1.127	0

Table III.
Summary statistics

Note: In Panel B, media1, media2 and media3 represent the number of media reports, while Media1, Media2 and Media3 represent the logarithm values, which can be represented by the following equation: Media1 = log (1 + media1)

Panel C of Table III shows the media reports according to their industries. The industries that received most media attention were industry B (the extractive industry) with 14.552 average media reports and industry E (the construction industry), with 11.444 average media reports. The industry of least concern to the media was industry G (the information technology industry), with 4.426 average media reports.

Panel A of Table IV shows the results for the univariate analysis of the mean differences of test variables between different CEO reputation samples. We can see from Table IV that the |DA| of the high-reputation group was significantly higher than that of the low-reputation group, indicating that companies with CEOs of high reputation tended to have a higher likelihood of engaging in earnings management, which was consistent with *H2a*. The values of Media1, Media2 and Media3 for the high-reputation group were also significantly higher than those of the low-reputation group, indicating that companies with CEOs of high reputation attracted more attention from the media. In addition, the values of *Age*, *ROA*, *Size*,

Variables	High CEO reputation Mean	STD	Low CEO reputation Mean	STD	Mean difference (High − Low)	*t*-statistic
Panel A: Summary statistics of variables partitioned by CEO reputation						
|DA|	0.096	0.581	0.069	0.159	0.028*	−1.884
Media1	1.098	0.289	0.549	0.343	0.548***	−35.909
Media2	0.046	0.146	0.016	0.083	0.030***	−6.294
Media3	2.501	0.691	1.250	0.787	1.252***	−35.384
SOE	0.721	0.449	0.703	0.457	0.018	−0.845
Age	53.151	6.277	51.863	6.633	1.287***	−4.253
LEV	0.452	0.203	0.449	0.210	0.003***	−0.322
ROA	0.049	0.063	0.034	0.055	0.015***	−5.901
Growth	0.680	3.652	0.962	4.741	−0.282	1.353
Size	22.691	1.343	21.931	1.139	0.760***	−13.796
MB	1.909	1.093	1.900	1.131	0.009	−0.178
Duality	0.010	0.098	0.013	0.113	−0.003	0.626
Indep	0.370	0.057	0.362	0.047	0.008***	−3.463
Big10	0.459	0.499	0.364	0.481	0.095***	−4.214

Variables	SOE Mean	STD	NSOE Mean	STD	Mean difference (SOE − NSOE)	*t*-statistic
Panel B: Summary statistics of variables partitioned by ownership type						
|DA|	0.076	0.364	0.074	0.151	0.002	−0.113
Media1	0.691	0.410	0.659	0.394	0.032*	−1.794
Media2	0.019	0.094	0.033	0.121	−0.013***	3.023
Media3	1.576	0.944	1.493	0.907	0.083**	−2.035
HREP	0.246	0.431	0.230	0.421	0.016	−0.845
Age	52.202	5.830	52.106	8.093	0.097	−0.338
LEV	0.457	0.211	0.432	0.202	0.025	−2.731
ROA	0.035	0.055	0.043	0.063	−0.008***	3.285
Growth	0.938	4.627	0.785	4.191	0.153	−0.782
Size	22.278	1.257	21.720	1.082	0.558***	−10.609
MB	1.793	1.002	2.167	1.333	−0.374***	7.764
Duality	0.011	0.102	0.016	0.126	−0.006	1.168
Indep	0.364	0.050	0.364	0.049	0.000	0.100
Big10	0.423	0.494	0.300	0.459	0.123***	−5.844

Notes: *, ** and *** represent significance at the levels of 0.10, 0.05 and 0.01, respectively

Table IV.
Descriptive statistics
by group

Indep and *Big10* for the high-reputation group were also significantly higher than those for the low-reputation group.

Panel B of Table IV divides our sample into SOE and NSOE groups. As shown in Table IV, we can see that the mean value of |DA| for the SOE group was higher than for the NSOE group, but its difference was not significant. The values of Media1, Media2 and Media3 for the SOE group were significantly higher than for those of the NSOE group, which reflected that SOEs received more attention from the media than did NSOEs. We can also see from the table that the mean values of *ROA* and *MB* for SOEs were significantly lower than for NSOEs, while the mean values of *Size* and *Big10* for SOEs were significantly higher than for NSOEs.

Table V reports the Pearson (Spearman) correlation coefficients among our main variables. We found that both *Media2* and *HREP* were positively correlated with |DA|, which was consistent with our expectations.

4.2 Regression results
4.2.1 Media reports, CEO reputation and earnings management. Table VI presents the results of our analyses of the effects of media reports on earnings management. Model (1) represented the main effect of media reports (Media1) on earnings management (|DA|). Model (2) examined the separate effect of CEO reputation (*HREP*) on earnings management (|DA|). Model (3) and Model (4) incorporated both CEO reputation (*HREP*) and ownership nature (SOE), while Model (5) included all three variables. The regression results suggested:

- Media1 is consistently significantly and positively associated with earnings management (|DA|). This result suggested that the degree of earnings management is higher when the firm receives more media attention, supporting *H1a*.

- HREP was significantly and positively associated with earnings management at the 5 per cent level, showing that firms with more well-reputed CEOs tend to engage more in earnings management, supporting *H2a*.

Panel B of Table VI shows the results of the test on the effects of the interactions between media reports, CEO reputation and state ownership on earnings management. In Table VIII, we introduced the interactional variables between media reports (Media1), CEO reputation (HREP) and state ownership (SOE). *H2b* predicted that media reports would increase the likelihood of earning management by those firms with CEOs of high reputation, while *H3a* predicted that media reports would intensify earnings management at SOEs. To avoid the potential multicollinearity problems between interaction terms and other variables, we conducted the center process on the interaction terms (Miao *et al.*, 2014). Untabulated variance inflation factor (VIF) values showed that there were no multicollinearity problems in our sample.

The results of Models (1)-(4) in Table VI show that:

- Media1 was still significantly and positively correlated with earnings management in all four models, showing a strong robustness amongst our results, supporting *H1a* which predicted that the degree of earnings management would be higher for companies that received more media reports.

Variables	|DA|	Media1	Media2	Media3	HREP	SOE	Age	LEV	ROA	Growth	Size	MB	Same	Indep	Big10
|DA|	1.000	0.008	0.048**	0.001	0.044**	-0.027	-0.012	0.013	0.002	0.017	-0.071***	0.113***	-0.005	-0.012	-0.069***
Media1	0.029	1.000	0.141***	0.994***	0.574***	0.028	0.065***	0.070***	0.126***	-0.058***	0.379***	-0.095***	-0.010	0.031	0.110***
Media2	0.086***	0.161***	1.000	0.055***	0.112***	-0.062***	-0.054***	0.091***	-0.023	0.047**	-0.019	0.002	0.036*	0.030	0.005
Media3	0.026	0.995***	0.078***	1.000	0.566***	0.034*	0.071***	0.060***	0.131***	-0.062***	0.385***	-0.098***	-0.012	0.027	0.111***
HREP	0.037*	0.579***	0.124***	0.574***	1.000	0.017	0.089***	0.009	0.131***	-0.024	0.252***	0.002	-0.012	0.059***	0.083***
SOE	0.002	0.036*	-0.060***	0.040**	0.017	1.000	0.030	0.061***	-0.060***	0.010	0.189***	-0.157***	-0.023	0.006	0.115***
Age	-0.051***	0.066***	-0.059***	0.072***	0.084***	0.007	1.000	-0.068***	0.134***	0.006	0.183***	-0.076***	-0.005	-0.044**	0.092***
LEV	-0.012	0.073***	0.098***	0.063***	0.006	0.054***	-0.073***	1.000	-0.377***	0.030	0.217***	-0.209***	-0.005	-0.000	0.024
ROA	0.003	0.105***	-0.052***	0.113***	0.116***	-0.065***	0.122***	-0.406***	1.000	-0.004	0.081***	0.214***	-0.029	-0.032	0.007
Growth	0.007	-0.027	0.005	-0.027	-0.027	0.016	0.027	0.002	-0.032	1.000	-0.013	0.034*	0.019	0.001	-0.013
Size	-0.013	0.413***	0.005	0.419***	0.263***	0.205***	0.181***	0.196***	0.082***	-0.023	1.000	-0.553***	-0.051**	0.068***	0.200***
MB	-0.003	-0.056***	0.008	-0.0581***	0.004	-0.152***	-0.069***	-0.178***	0.228***	-0.006	-0.446***	1.000	0.011	-0.0070	-0.088***
Duality	0.002	-0.011	0.023	-0.0127	-0.012	-0.023	-0.006	-0.008	-0.023	-0.017	-0.050**	0.014	1.000	0.0006	0.015
Indep	-0.018	0.037*	0.030	0.0337*	0.068***	-0.002	-0.032	-0.002	-0.042**	0.029	0.058***	0.020	0.008	1	0.018
Big10	-0.031	0.118***	0.001	0.1183***	0.083***	0.115***	0.086***	0.027	0.014	-0.013	0.229***	-0.059***	0.015	0.0262	1.000

Notes: *, ** and *** represent significance at the levels of 0.10, 0.05 and 0.01, respectively; spearman correlations are reported above and Pearson correlations are reported below the diagonal; see Table II for variable definitions

Table V.
Correlations

	Dependent variable = |DA|				
Variables	(1)	(2)	(3)	(4)	(5)

Panel A: The impacts of media coverage, CEO reputation and ownership type on earnings management

	(1)	(2)	(3)	(4)	(5)
Media1	0.0556*** (0.004)		0.044** (0.046)	0.057*** (0.003)	0.045** (0.041)
HREP		0.037** (0.018)	0.019 (0.288)		0.019 (0.294)
SOE				0.014 (0.321)	0.014 (0.328)
Age	−0.003** (0.013)	−0.003** (0.011)	−0.003** (0.012)	−0.002** (0.014)	−0.003** (0.012)
LEV	−0.022 (0.520)	−0.019 (0.580)	−0.021 (0.539)	−0.022 (0.534)	−0.021 (0.552)
ROA	0.015 (0.911)	0.018 (0.890)	0.011 (0.936)	0.023 (0.860)	0.019 (0.886)
Growth	−0.000 (0.928)	−0.000 (0.972)	−0.000 (0.950)	−0.000 (0.899)	−0.000 (0.921)
Size	−0.009 (0.215)	−0.004 (0.578)	−0.010 (0.200)	−0.010 (0.175)	−0.011 (0.164)
MB	−0.011 (0.156)	−0.008 (0.258)	−0.011 (0.149)	−0.010 (0.169)	−0.011 (0.161)
Duality	−0.010 (0.866)	−0.006 (0.914)	−0.009 (0.871)	−0.009 (0.873)	−0.009 (0.877)
Indep	−0.116 (0.366)	−0.127 (0.322)	−0.124 (0.334)	−0.116 (0.367)	−0.124 (0.335)
Big10	−0.0212 (0.105)	−0.021 (0.123)	−0.022 (0.102)	−0.023* (0.088)	−0.023* (0.086)
Year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
N	2,556	2,556	2,556	2,556	2,556
Adjusted R^2 (%)	0.91	0.8	0.91	0.91	0.91

Panel B: The impacts of the interactions among media coverage, CEO reputation and ownership type and earnings management

	(1)	(2)	(3)	(4)	
Media1	0.049** (0.03)	0.057*** (0.003)	0.050** (0.026)	0.050** (0.026)	
HREP	0.003 (0.893)		0.005 (0.840)	0.005 (0.844)	
SOE		0.0161 (0.267)	0.016 (0.279)	0.016 (0.278)	
Media1 × HREP	0.052 (0.302)		0.044 (0.380)	0.045 (0.378)	
Media1 × SOE		0.062* (0.083)	0.058 (0.102)	0.063 (0.143)	
HREP × SOE				−0.007 (0.860)	
Age	−0.003** (0.010)	−0.002** (0.014)	−0.003** (0.011)	−0.003** (0.011)	
LEV	−0.022 (0.524)	−0.020 (0.568)	−0.020 (0.572)	−0.020 (0.569)	
ROA	0.010 (0.941)	0.349 (0.789)	0.029 (0.822)	0.028 (0.829)	
Growth	−0.000 (0.948)	−0.000 (0.908)	−0.000 (0.928)	−0.000 (0.928)	
Size	−0.011 (0.151)	−0.012 (0.130)	−0.013* (0.096)	−0.013* (0.097)	
MB	−0.011 (0.129)	−0.011 (0.140)	−0.012 (0.119)	−0.012 (0.119)	
Duality	−0.010 (0.869)	−0.009 (0.870)	−0.009 (0.119)	−0.008 (0.872)	
Indep	−0.131 (0.307)	−0.127 (0.323)	−0.140 (0.276)	−0.141 (0.275)	
Big10	−0.022* (0.097)	−0.024* (0.081)	−0.024* (0.076)	−0.024* (0.076)	
Year dummies	Yes	Yes	Yes	Yes	
Industry dummies	Yes	Yes	Yes	Yes	
N	2,556	2,556	2,556	2,556	
Adjusted R^2 (%)	0.92	0.99	0.98	0.94	

Notes: *, ** and ***represent significance at the levels of 0.10, 0.05 and 0.01, respectively

Table VI.
The impacts of
media on earnings
management

- The interaction of Media1 and SOE in Model (2) was significant at the 10 per cent level, though this interaction was not significant in Model (3) and Model (4), which provided some support for *H3a*.

- In Model (1), the interaction of Media1 and HREP was not significant, which indicated that the overall media attention to CEOs with higher reputations did not seem to increase the likelihood of earnings management, rejecting *H2b*. However, whether the tone of the media makes a difference is still subject to testing.

4.2.2 Negative media reports, CEO reputation and earnings management. Panel A of Table VII presents the results of the examinations of the effects of negative media reports on earnings management. Model (1) represented the main effect of negative media reports (Media2) on earnings management (|DA|). Models (2) and (3) integrated CEO reputation (HREP) and ownership nature (SOE) into the models, and Model (4) included all three variables. The regression results showed that Media2,

	Dependent variable = |DA|			
Variables	(1)	(2)	(3)	(4)
Panel A: The impacts of negative media coverage, CEO reputation and earnings management				
Media2	0.273*** (0.000)	0.258*** (0.000)	0.278*** (0.000)	0.262*** (0.000)
HREP		0.028* (0.078)		0.028* (0.076)
SOE			0.016 (0.269)	0.016 (0.261)
Age	−0.002** (0.024)	−0.002** (0.019)	−0.002** (0.026)	−0.002** (0.021)
LEV	−0.032 (0.361)	−0.030 (0.384)	−0.031 (0.371)	−0.030 (0.394)
ROA	0.045 (0.726)	0.033 (0.799)	0.055 (0.670)	0.043 (0.740)
Growth	−0.000 (0.913)	−0.000 (0.946)	−0.000 (0.881)	−0.000 (0.913)
Size	0.001 (0.865)	−0.003 (0.725)	0.000 (0.960)	−0.003 (0.639)
MB	−0.007 (0.350)	−0.008 (0.252)	−0.006 (0.383)	−0.008 (0.279)
Duality	−0.011 (0.853)	−0.011 (0.845)	−0.010 (0.861)	−0.011 (0.853)
Indep	−0.122 (0.340)	−0.135 (0.291)	−0.122 (0.341)	−0.135 (0.291)
Big10	−0.019 (0.156)	−0.020 (0.136)	−0.020 (0.131)	−0.021 (0.113)
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
N	2,556	2,556	2,556	2,556
Adjusted R^2 (%)	1.35	1.43	1.35	1.44
Panel B: The impacts of the interactions among negative media coverage, CEO reputation and ownership type on earnings management				
Media2	0.120* (0.087)	0.325*** (0.000)	0.164** (0.020)	0.163** (0.021)
HREP	0.025 (0.117)		0.028* (0.080)	0.028* (0.083)
SOE		0.017 (0.242)	0.019 (0.177)	0.020 (0.167)
Media2 × HREP	0.532*** (0.000)		0.587*** (0.000)	0.597*** (0.000)
Media2 × SOE		0.491*** (0.000)	0.569*** (0.000)	0.550*** (0.000)
HREP × SOE				0.031 (0.345)
Age	−0.002** (0.020)	−0.002** (0.028)	−0.002** (0.023)	−0.002** (0.022)
LEV	−0.029 (0.406)	−0.028 (0.422)	−0.024 (0.488)	−0.023 (0.507)
ROA	0.042 (0.748)	0.062 (0.633)	0.060 (0.642)	0.069 (0.593)
Growth	0.000 (0.973)	−0.000 (0.895)	0.000 (0.981)	0.000 (0.980)
Size	−0.002 (0.761)	−0.000 (0.962)	−0.004 (0.552)	−0.005 (0.510)
MB	−0.007 (0.333)	−0.006 (0.400)	−0.006 (0.386)	−0.007 (0.370)
Duality	−0.011 (0.853)	−0.003 (0.965)	−0.001 (0.982)	−0.001 (0.984)
Indep	−0.118 (0.358)	−0.113 (0.377)	−0.106 (0.405)	−0.108 (0.396)
Big10	−0.019 (0.164)	−0.022 (0.109)	−0.022 (0.110)	−0.022 (0.105)
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
N	2,556	2,556	2,556	2,556
Adjusted R^2 (%)	2.09	1.79	2.70	2.70

Notes: *, **and ***represent significance at the levels of 0.10, 0.05 and 0.01, respectively

Table VII.
The effect of negative media coverage

the measure of negative media reports, was significantly correlated with earnings management (|DA|) at the 1 per cent level, which showed that the degree of earnings management was higher when a firm received more negative media reports. Thus, *H1b* was supported to some extent.

Table VII shows the results of the examinations of whether the effects of negative media reports on earnings management would be influenced by CEO reputation and ownership type. In Table X, we gradually added the interaction items between negative media reports (Media2) and the other two factors: CEO reputation (HREP) and ownership type (SOE). The results of Models (1)-(4) suggested that:

- Media2 was significantly and positively correlated with earnings management at the 1 per cent level in all four models, which further verified *H1b*.
- The interaction terms between Media2 and HREP were all significantly positively correlated with earnings management, which demonstrated that negative media reports would increase the earnings management of reputed CEOs, so *H2c* was partly verified.
- In Models (2), (3) and (4), the interaction of Media2 and SOE was significantly positively correlated with earnings management at the 1 per cent level, which told us that negative media reports would increase the likelihood of earnings management at SOEs, so *H3b* was also partly verified.

4.2.3 Negative media reports vs non-negative media reports. Comparing the regression results of Table VI and VII we found that the coefficient of the interaction of Media2 and HREP in Table VII was very significant, while the interaction of Media1 and HREP in Table VI was not significant, which suggested that the effects of reputation mechanism of media reports on earnings management would be influenced by the type of media reports. Meanwhile, the interaction term of Media2 and SOE had a higher significance level than the interaction term of Media1 and SOE, which also indirectly showed that negative media reports had more effects on SOEs. To further compare the effects between negative media reports and non-negative reports, we incorporated both non-negative media reports (Media3) and negative media reports (Media2) into one model so as to study the different effects of these two type of media reports on earnings management.

Table VIII summarizes the test results of the effects of different types of media reports on earnings management. Models (1)-(4) represent the models without adding interaction items. Model (1) verifies the different effects of negative media reports (Media2) and non-negative reports (Media3) on earnings management. In Models (2) and (3), the proxy variables of CEO reputation (HREP) and ownership nature (SOE) were added into Model (1) separately, while Model (4) includes all these four variables. The regression results show: the coefficients of Media2 and Media3 in these four models were all significant and positive, which demonstrated that both negative media reports and non-negative media reports would increase the likelihood of earnings management at listed companies. Untabulated *t*-tests to compare the differences of the coefficients of Media2 and Media3 showed that the coefficients of Media2 were all significantly higher than the coefficients of Media3 across all models, suggesting that negative media reports exhibited greater influence on earnings management than non-negative media reports. Thus, *H1b* was supported.

Variables	(1)	(2)	(3)	Dependent variable = |DA| (4)	(5)	(6)	(7)	(8)
Media2	0.258*** (0.000)	0.253*** (0.000)	0.263*** (0.000)	0.258*** (0.000)	0.112 (0.109)	0.311*** (0.000)	0.155** (0.028)	0.155** (0.028)
Media3	0.019** (0.022)	0.016* (0.099)	0.020** (0.019)	0.016* (0.087)	0.020** (0.040)	0.021** (0.014)	0.021** (0.029)	0.021** (0.027)
HREP		0.014 (0.452)		0.013 (0.464)	-0.006 (0.810)		-0.003 (0.910)	-0.003 (0.911)
SOE			0.018 (0.219)	0.018 (0.224)		0.020 (0.160)	0.023 (0.116)	0.023 (0.117)
Media2 × HREP					0.550*** (0.000)		0.614*** (0.000)	0.614*** (0.000)
Media2 × SOE						0.483*** (0.001)	0.554*** (0.000)	0.554*** (0.000)
Media3 × HREP					0.020 (0.354)		0.017 (0.431)	0.017 (0.433)
Media3 × SOE						0.023 (0.130)	0.025 (0.110)	0.024 (0.183)
HREP × SOE								0.002 (0.967)
Age	-0.002** (0.022)	-0.002** (0.020)	-0.002** (0.023)	-0.0023** (0.022)	-0.002** (0.018)	-0.002** (0.025)	-0.002** (0.022)	-0.002** (0.022)
LEV	-0.032 (0.359)	-0.031 (0.371)	-0.031 (0.370)	-0.030 (0.381)	-0.030 (0.380)	-0.027 (0.444)	-0.024 (0.485)	-0.024 (0.486)
ROA	0.028 (0.827)	0.026 (0.845)	0.039 (0.764)	0.036 (0.782)	0.032 (0.805)	0.056 (0.669)	0.063 (0.629)	0.063 (0.628)
Growth	-0.000 (0.913)	-0.000 (0.929)	-0.000 (0.877)	-0.000 (0.892)	0.000 (0.993)	-0.000 (0.899)	0.000 (0.997)	0.000 (0.997)
Size	-0.007 (0.344)	-0.007 (0.328)	-0.008 (0.277)	-0.009 (0.264)	-0.009 (0.240)	-0.010 (0.178)	-0.012 (0.108)	-0.012 (0.108)
MB	-0.010 (0.168)	-0.010 (0.161)	-0.010 (0.185)	-0.010 (0.179)	-0.010 (0.183)	-0.010 (0.160)	-0.010 (0.184)	-0.010 (0.184)
Duality	-0.014 (0.808)	-0.014 (0.812)	-0.013 (0.815)	-0.013 (0.819)	-0.014 (0.814)	-0.007 (0.908)	-0.005 (0.931)	-0.005 (0.931)
Indep	-0.126 (0.323)	-0.132 (0.303)	-0.126 (0.324)	-0.132 (0.304)	-0.119 (0.351)	-0.128 (0.318)	-0.117 (0.358)	-0.117 (0.358)
Big10	-0.021 (0.119)	-0.021 (0.116)	-0.023* (0.096)	-0.023* (0.094)	-0.020 (0.132)	-0.024* (0.074)	-0.024* (0.080)	-0.024* (0.080)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,556	2,556	2,556	2,556	2556	2556	2556	2556
Adjusted R^2 (%)	1.51	1.49	1.53	1.51	2.19	2.03	2.88	2.84

Notes: *, ** and *** represent significance at the levels of 0.10, 0.05 and 0.01, respectively

Table VIII.
Impacts of negative
media coverage vs
non-negative media
coverage on earnings
management

Models (5)-(8) in Table VIII show the regression results after adding the interaction items. The regression results show that:

- In all related models, the interaction of Media2 and HREP was significantly positively associated with earnings management at the 1 per cent level, while all the coefficients of the interactions of Media3 and HREP were not significant. This result suggested that only negative media reports affected the earnings management level in firms with more well-reputed CEOs, while non-negative media reports showed no effect. Therefore, *H2c* was supported.

- In Models (6), (7) and (8), the interactions of Media2 and SOE were all significantly and positively correlated with earnings management at the 1 per cent level, while all the coefficients of the interaction of Media3 and SOE were not significant, which told us that only negative media reports would affect SOEs' earnings management, while non-negative media reports had no effect, thus *H3b* was also supported.

5. Conclusion
Using A-shares companies listed on the Shanghai Stock Exchange from 2008 to 2012, this paper has examined the effects of media reports on earnings management from the perspective of the reputation mechanism of the media. Meanwhile, we also examined how state ownership interacts with media reports and impacts earnings management. Our results showed first that media reports about listed companies could incentivize or pressurize managers to use earnings management to achieve earnings goals, to satisfy the expectations of investors. Meeting market expectations increases management's private benefits in their turn, which includes reputational benefits, compensation benefits and capital gains on stock markets. Second, due to the low punishment costs, managers seem to take the risks associated with earnings management to obtain the huge benefits accruable from the activity. The media does not seem to have any restraining effect on earnings management. Thirdly, the reputation mechanism of the media works in China, but with a different result when compared with those seen in developed countries. Specifically, firms with more well-reputed CEOs tend to make myopic decisions and are more likely to use earnings management to achieve earnings goals than firms with less well-reputed CEOs. Thirdly, media reports, especially negative media reports, exacerbate the degree of earnings management at SOEs, which shows that media reports have brought more benefits than costs for the managers of SOEs, providing them with incentives to manage earnings. Lastly, the tone of the media interacts with CEO reputations and state ownership, and thus seems to have a significant impact on earnings management. Specifically, those firms with more well-reputed CEOs tend to use earnings management more when they also receive more negative media. Similarly, SOEs are more likely to use earnings management when they receive more negative media reports. Both results show that the tone of the media may put additional pressure on executives to engage in earnings management, especially when they are firms with well-reputed CEOs and firms in state ownership.

Our research has enriched the literature concerning earnings management and the roles of the media, providing some new perspectives for exploring the relationship between earnings management and corporate governance. The main

contribution of our paper lies in the verification of the existence of the reputation mechanism of the media on China's stock markets.

Our findings show that media reports about China's stock markets have not played a monitoring role in constraining executives' earnings management. On the contrary, it has actually been an incentive for executives to use earnings management. It does not mean that the media should be criticized, but shows that there is a need for more effective and healthy legal enforcement systems, which will increase the punishment costs for engaging in earnings management. At the same time, it might be necessary to attract more professional investors such as institutional investors into the market, to reduce the impact of the media on the volatility of stock prices, which in turn would lower the reputation benefits that presently spin-out of earnings management. In addition, we should pay more attention to the earnings quality of those firms who have reputed CEOs and are in state ownership, as they tend to be affected more by the media. The compensation and promotion schemes at those companies should be reconsidered. Our research provides some evidence of the roles of the media on earnings management in emerging economies, which are often different from those in developed economies.

Note

1. In accordance with the provisions of both Shanghai and Shenzhen Stock Exchanges, if a listed firm has losses for two consecutive years or net assets per share lower than the book value in the current year, it would be placed in a different trading system, and the firm's name would be tagged with special treatment (ST). If losses continue for three consecutive years, the firm can be delisted from the stock exchanges.

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