

Article

Are State-Owned Enterprises Equally Reliable Information Suppliers? An Examination of the Impacts of State Ownership on Earnings Management Strategies of Chinese Enterprises

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Abstract: Earnings management refers to a company's use of either accounting techniques (accrual-based earnings management) or real economic activities (real earnings management) to manipulate reported earnings and mislead users of financial information. It often indicates serious ethical issues in a company's management, which will affect the reliability and sustainability of a firm's services in the supply chain. Using A-share listed Chinese firms on the Shanghai and Shenzhen Stock Exchanges, we investigated the impacts of state ownership on management's decision to select real or accrual-based earnings management strategies. We found that state-owned enterprises (SOEs) tend to favor real earnings management over accrual-based earnings management more than non-SOEs. Furthermore, those SOEs that are controlled by the central government engage in real earnings management more often than those controlled by local governments. We also examined whether media attention and litigation interact with state ownership to affect earnings management. We found that SOEs, especially central SOEs, with a high level of media attention or an incidence of litigation, are more likely to use real earnings management. Our research can assist firms in making better decisions in selecting business partners and service suppliers in an emerging market through the assessment of management integrity.

Keywords: state ownership; earnings management; supply chain; management integrity; media attention**MSC:** 62J05

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1. Introduction

In recent years, economic recession, pandemics, and regional conflicts have led to numerous business risks for organizations, making it more important for companies to enhance their risk governance processes [1]. Prior studies have found that companies prioritize suppliers' technical capabilities, cost, quality, delivery, and service when choosing suppliers [2]. Additionally, accounting information can help firms evaluate suppliers' operational efficiency, cost management, and profitability [3]. However, the question remains: can people trust the earnings information provided by suppliers? How could suppliers have manipulated reported earnings to mislead users of accounting information? This paper investigates how state ownership may have influenced the decision making of managers in Chinese listed companies with regards to the manipulation of reported earnings (referred to as earnings management in this study).

Currently, a large percentage of listed firms in China are still owned and controlled directly or indirectly by the Chinese government. As a developing and transitional economy, China is trying to balance centralization and decentralization. State-owned enterprises (SOEs) can be divided into central SOEs and local SOEs (Central SOEs represent companies that are ultimately controlled by the central government and its agencies, including the State Council, the State-Owned Assets Supervision and Management Committee, the

Ministry of Finance, the Ministry of Education, and other relevant government departments. Local SOEs are enterprises that are controlled by local governments, such as provincial or city governments and their agencies, e.g., the local finance bureau and local educational departments [4]). It is therefore important to analyze how the presence and the type of state ownership may affect managerial decisions. Extant literature has extensively investigated the effect of state ownership on earnings, but few studies have explored the differences in earnings management strategies among different types of SOEs. Our study performs an in-depth analysis of how state ownership type impacts a firm's decision to select a particular earnings management strategy in the China setting. In extending the literature on the impact of state ownership on earnings management, we also analyze whether other factors, e.g., media attention and litigation, interact with state ownership to impact managers' selection of earnings management strategies.

The Chinese government has been working to enhance stability and financial performance of SOEs to keep pace with the country's rapid economic growth. Over the last 20 years, it has implemented financial performance measures to evaluate the performance of executives in SOEs. Under this increased governmental pressure to improve financial performance, managers of SOEs may be more likely to use earnings management to reach their earnings goals. We believe that SOEs may choose an earnings management strategy that lowers the risk of being exposed, thereby avoiding the scrutiny and criticism of regulators and auditors. Furthermore, little is known about whether central SOEs and local SOEs may display distinct patterns in their selection of earnings management strategies. Our study will also attempt to examine this issue.

Extant accounting literature recognizes two major types of earnings management: accrual-based earnings management (referred to as "accruals management" hereafter) and real earnings management. Accruals management is used by managers to achieve earnings goals through the manipulation of accounting accruals, e.g., changing the estimates of bad debt expenses and depreciation expenses. In contrast, managers use real earnings management, e.g., reducing R&D expenditures or granting additional sales discounts, to achieve earnings targets by manipulating the timing of investment and financing decisions [5,6].

There are only a few studies that examine the impact of state ownership on managers' selection of earnings management strategies. Fan and Song [7] find that Chinese central SOEs use real earnings management to help the government reduce GDP volatility. However, they base their findings on a small sample (100 central SOEs, 100 local SOEs, and 200 non-SOEs). Wang et al. [8] examine whether SOEs are more likely to use real earnings management than accruals management to achieve earnings goals, but they do not examine whether such strategy is impacted by other factors such as media attention and litigation. Li et al. [9] find the highly valued SOEs have lower levels of abnormal accruals than highly valued non-SOEs during periods of high valuation. Habib et al. [10] argue that ownership structure plays a crucial role in the determinants of real earnings management.

One major limitation of these prior studies is that they examine the two types of earnings management strategies separately instead of examining them within the same company. The high level of real earnings management in the results could be driven by some of the firms in the sample, while the low level of accruals management might be driven by other firms in that sample. Testing the two types of earnings management strategies separately may lead to incorrect conclusions from the regression results. To avoid this issue, we follow Braam et al. [11] to construct a set of measures for different combinations of earnings management strategies. This approach enables us to determine whether there is a substitution effect between accruals management and real earnings management at the firm level. In addition, we perform further analyses of whether media attention and litigation interact with state ownership to impact a firm's choice of earnings management strategies.

In this paper, we sample A-share companies listed on the Shanghai and Shenzhen Stock Exchanges during 2003 to 2018 to investigate the impact of state ownership on earnings management strategies. We find evidence to support our primary hypothesis that,

although non-SOEs and SOEs both engage in the same level of earnings management, SOEs tend to favor real earnings management over accruals management. Furthermore, we find that, when compared with local SOEs and non-SOEs, central SOEs appear to prefer real earnings management to accruals management. To explore the reasons behind the trade-off issue of earnings management in SOEs, we also test whether media attention and litigation interact with state ownership to influence managers' selection of earnings management strategies. We find that SOEs with high media attention are more likely to substitute real earnings management for accruals management. The impact is more prominent in central SOEs. Similar results are found in the joint effects of litigation and state ownership on earnings management. These results suggest that those firms that are most concerned with the exposure of earnings management appear to prefer real earnings management to accruals management.

This paper has two major contributions to the extant earnings management literature. First, prior studies that have investigated the relationship between state ownership and earnings management have focused on either accruals management [9,12,13] or real earnings management [14,15]. We believe that it is necessary to examine both types of earnings management strategies at the firm level to determine whether there is a substitution between real earnings management and accruals management in the same company. To examine the trade-off issue between the two strategies at the firm level, we construct a set of measures for different combinations of earnings management strategies. We find that SOEs, especially central SOEs, tend to favor real earnings management over accruals management. This finding indicates that top executives in firms with strong political connections appear to be more concerned with their job security and the loss of the privileges obtained from political connections when earnings management is exposed. Therefore, they prefer the more obscure real earnings management over accruals management to avoid being exposed and penalized, even though real earnings management harms a firm in the long term. Second, we analyze whether other factors, such as media attention and litigation, interact with state ownership to have joint effects on earnings management strategies. We find that SOEs, especially central SOEs, with high media attention are more likely to use real earnings management. Similar results are found in SOEs with litigation. These results indicate that those factors that affect the exposure risk (e.g., media attention) and the scrutiny level (e.g., litigation) of external reviewers increase the cost of accruals management and thus increase the chance that real earnings management will be used by firms with strong political connections. These findings suggest that companies should pay attention to the reliability of accounting information when choosing service suppliers in the supply chain. It is essential for information users to evaluate whether firms have engaged in earnings management to manipulate reported earnings in order to demand a greater share of profits in negotiations. The government should also strengthen regulations on financial reporting to prevent companies from taking short-sighted actions through real earnings management, such as granting significant sales discounts or cutting costs through overproduction, to satisfy the needs of large customers in the supply chain.

This paper continues with Section 2, where we discuss the prior literature and develop our hypotheses. In Section 3, we describe our data collection procedures and research methodology. In Section 4, we discuss our empirical results, and in Section 5, we summarize our conclusions.

2. Background and Hypothesis Development

2.1. Earnings Management Strategies: Accruals Management vs. Real Earnings Management

Prior studies suggest that the practice of earnings management is driven by capital market motivations, contracting motivations, and regulatory motivations [16]. Contracting motivations can be subdivided into those associated with lending contracts and management compensation contracts [16]. In China, access to economic resources and capital is limited. Managers of non-SOEs are motivated to engage in earnings management to more effectively compete for financing in the capital and debt (lending contracts) markets.

On the contrary, SOEs face less pressure from the capital markets and lending contracts because of their preferential access to capital and loans [4]. Nevertheless, Chinese SOEs' managers might be motivated to manage earnings in order to increase their compensation and to obtain other contracting benefits such as formal and informal promotions [17–19]. Therefore, both SOEs and non-SOEs have motives to manipulate earnings, but are they different in terms of strategies of earnings management?

As discussed previously, the extant literature recognizes two major types of earnings management: accruals management and real earnings management [6,20,21]. Managers will consider the relative costs and benefits between the two to determine the best strategy to achieve earnings targets [20,22]. While accruals management takes less effort and time, it is subject to more scrutiny from regulators and auditors because it often violates regulatory rules [20,22,23]. Liao and Zhang [24] note that the government can more easily recognize a company's accruals management, increasing the exposure risk of earnings management. When accruals management is exposed to the public, managers suffer severe reputational loss, litigation costs, and punishment [25]. Real earnings management, on the other hand, is less scrutinized by regulators and auditors [20]. It is also more difficult to identify since real earnings management uses actual transactions and associated cash flows to achieve earnings goals. However, real earnings management represents a deviation from the best business practices and may have a negative impact on the firm's future performance [26].

Prior studies have found that, when there is tightened oversight or a higher cost associated with using accruals management, managers may favor the use of real earnings management over accruals management [20,22,23,27]. In addition, Ding et al. [28] found that politically affiliated firms are more likely to engage in real earnings management than non-affiliated firms to manipulate earnings. SOEs have stronger political connections and receive more government subsidies than non-SOEs. They also face increasing scrutiny and criticism from the public because of their importance to society and the economy [29]. Furthermore, the managers of SOEs often have political rank and work in a relatively closed internal labor market. It is difficult for these managers to find other comparable job opportunities if they leave SOEs [30]. Accordingly, managers of SOEs face a higher cost of reputation loss and the associated loss of privileges when earnings management practices are detected by the government and announced to the public [11,31,32]. Thus, they are more concerned with the costs associated with the loss of privileges caused by the exposure of earnings management than managers of non-SOEs [33].

Once earnings management behaviors of SOEs are exposed, the political reputations of the executives involved as well as those of the relevant government bureaus, parties, and officials are damaged [11,33], which hurts the job security and the promotional opportunities for the people involved. Unlike non-SOEs, top executives in SOEs are not owners of the company. They may be more short-sighted and may neglect the long-term goals of the company in order to maximize their personal benefits [34,35]. As a result, although real earnings management will damage a company's long-term value, it meets the need of managers in the short run because it is less detectable. At the same time, when compared to non-SOEs, managers in SOEs receive less pressure and oversight from other shareholders in a firm when making business decisions, lowering the cost of using real earnings management [25]. Furthermore, the prior literature finds that suppliers in developing countries with large customers in developed countries are more inclined to align their performance measurement systems with the performance priorities of customers [2]. Companies that aim for a long-term stable position in the international supply chain, such as SOEs, may be more inclined to employ real earnings management techniques, such as providing additional discounts and reducing costs through overproduction, to meet the needs of customers. Thus, we put forward the first hypothesis as follows:

Hypothesis 1a. *Compared with non-state-owned enterprises, state-owned enterprises are more likely to substitute real earnings management for accruals management.*

2.2. Central SOEs vs. Local SOEs

A series of reforms in the 1980s enabled the central government of China to transfer certain responsibilities and authorities to local governments located in its provinces, cities, and counties. Since then, local governments have more power to oversee local SOEs independently. Overall, compared to central SOEs, local SOEs tend to have less complex organizational structures, fewer political assignments from the government, and fewer political connections.

We believe that central SOEs and local SOEs view earnings management and its associated costs differently. The administrative rank of a central SOE is higher than that of a local SOE; thus, its management has more privileges and promotional opportunities [36,37]. The reform in the performance evaluation system for central SOEs in the recent two decades has led to a much closer connection between the firms' financial performance and the compensation and promotional opportunities for senior management. On the other hand, local SOEs operations are closely aligned with local economic performance. Local governments, who are the ultimate controllers of local SOEs, pay close attention to local SOEs' performance since they affect the local GDP, a measure that is used by the central government to evaluate the performance of local governments and officials. Thus, both central SOEs and local SOEs have motives to engage earnings management, but the costs of using different types of earnings management may look different to central SOEs and local SOEs.

Compared to local SOEs, central SOEs have more political connections and privileges. Prior studies found that managers in central SOEs are more interested in pursuing "grey" money, such as company-funded trips and benefits, and non-monetary benefits, such as political promotions and connections [18,19,34]. Braam et al. [11] argue that firms with strong political connections suffer more when there is a damage to their reputation and public image. Meanwhile, central SOEs are in industries that are critical to the national safety and economic development. Thus, compared to local SOEs, central SOEs receive more attention and criticism from the public and media when these firms perform poorly [38]. This pressure from the public may affect managerial decisions regarding earnings management strategy. As discussed previously, managers are concerned with the costs associated with the loss of privileges caused by the exposure of earnings management [33]. Such concern will be more pronounced in central SOEs where the exposure of any illegal or wrong doings will attract more severe criticism from the public, which may lead to public anxiety and thus concern the central government. Therefore, managers of central SOEs are more likely to choose an earnings management strategy that is less likely to be scrutinized or detected. For this reason, we believe that central SOEs are more likely to substitute real earnings management for accruals management than local SOEs. We put forward the following hypothesis:

Hypothesis 1b. *Central SOEs are more likely to substitute real earnings management for accruals management than local SOEs.*

2.3. Impact of Other Factors: Media Attention and Litigation

Braam et al. [11] found that politically connected firms that are established in countries with high levels of public monitoring are more likely to substitute real earnings management for accruals management. The impact of public monitoring in China has not been examined in prior studies. In this study, we will use media attention to proxy for public monitoring and examine how it affects managerial decisions on earnings management strategies.

The extant Chinese literature on news media finds that the media has a positive monitoring effect on a firm's business decisions. Li and Shen [39] found that articles published by market-oriented media can push top management of a firm to take actions to correct their mistakes. Furthermore, the impact of the media is done through the intervention of government [39]. Chen [29] finds that the media has more positive governance effects on SOEs than on non-SOEs when the institutional environment is relatively weak. As discussed previously, managers of SOEs, especially central SOEs, are most concerned with

their job security and all the privileges they receive from political connections. We believe that media attention will exacerbate the impacts of state ownership on earnings management. Thus, the managers in SOEs, especially central SOEs, would favor the use of real earnings management over accruals management in order to reduce the risk of exposure. For this reason, we propose the following two hypotheses:

Hypothesis 2a. *Compared with non-SOEs, SOEs with high media attention are more likely to substitute real earnings management for accruals management.*

Hypothesis 2b. *Compared with local SOEs, central SOEs with high media attention are more likely to substitute real earnings management for accruals management.*

The prior literature has found that tightened regulations and external reviews may lead to the substitution of real earnings management for accruals management [23,27]. Will an anticipated increase of scrutiny level also have a bigger impact on those firms, e.g., SOEs that are most concerned with an exposure of earnings management? To examine this issue, we use litigation as an extraneous factor to measure how an anticipated increase in scrutiny may affect managerial decisions of different types of companies. By analyzing debt-related lawsuits, Wang et al. [40] found that SOEs in litigation tend to reduce their accruals management. However, they did not examine whether there was an increase in the use of real earnings management in their study. On the other hand, Qian and Yu [41] found that there is an increase of accruals management in non-SOEs without political connections when there is an incidence of litigation, while it is not found in SOEs. Based on our previous discussions, we believe that those firms that are most concerned with exposure of earnings management are more likely to be affected when there is an anticipated increase of scrutiny level from external reviewers. For this reason, SOEs, especially central SOEs, may choose to use real earnings management over accruals management when they have ongoing litigations. Thus, we propose the following two hypotheses:

Hypothesis 3a. *Compared with non-SOEs, SOEs that are in litigation are more likely to substitute real earnings management for accruals management.*

Hypothesis 3b. *Compared with local SOEs, central SOEs that are in litigation are more likely to substitute real earnings management for accruals management.*

3. Sample and Methods

3.1. Data and Sample Selection

We used A-share companies listed on the Shenzhen and Shanghai Stock Exchanges from 2003 to 2018 to select our full sample according to the process described in Panel A of Table 1. We excluded all firms in the financial and insurance industries (944 firm-year observations) and those observations with missing data (8544 firm-year observations) from our sample. The final sample we used to test Hypothesis 1a, 1b and Hypothesis 3a, 3b totaled 11,905 firm-year observations. The financial data were obtained from the China Stock Market and Accounting Research (CSMAR) database and the iFinD database (iFinD is a financial database providing information of stocks, bonds, funds, futures, indexes, etc. of Chinese financial markets). To examine the joint effects of state ownership and media attention on earnings management (Hypothesis 2a, 2b), we selected a reduced sample from A-share companies listed on the Shanghai Stock Exchange from 2008 to 2012 according to the process described in Panel B of Table 1. We used a reduced sample for the test on media attention due to the concern that the impact of traditional media, such as newspaper, on earnings management may be diluted by that of social media in recent years. The final reduced sample included 1816 firm-year observations after excluding firms in the financial and insurance industries and firms with missing data.

Table 1. Sample Selection Process. Panel (A) Full Sample. Panel (B) Media Sample.

(A)	
A-share firms listed on Shanghai and Shenzhen Stock Exchanges (2003~2018)	21,393
Less: companies in financial and insurance industries	(944)
Less: companies with missing data	(8544)
Final full sample	11,905
(B)	
A-share firms listed on Shanghai Stock Exchange (2008~2012)	4451
Less: companies in financial and insurance industries	(133)
Less: companies with missing data	(2502)
Final media sample	1816

3.2. Methodology

3.2.1. Measure of Variables

- Accruals management

In this study, we used the modified Jones Model [42] to estimate discretionary accruals as the proxies for measuring accruals management. Researchers have proposed a variety of models to measure earnings management. The modified Jones Model [42] has been widely accepted and used in prior earnings management research [43,44]. While recent literature also uses a number of revised models to measure discretionary accruals, such as the performance-adjusted Jones Model [23,45], Chinese scholars have found that the modified Jones Model has better explanatory power in Chinese stock markets compared to other models [46,47]. Thus, we used it to estimate discretionary accruals.

Following Dechow et al. [43], we used the following model to estimate non-discretionary accruals:

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

where NDA_{it} represents non-discretionary accruals; $A_{i,t-1}$ represents total assets at the end of year $t - 1$; $\Delta REV_{i,t}$ represents the change of sales revenues; $\Delta REC_{i,t}$ represents the change of account receivables; $PPE_{i,t}$ is the year-end balance of gross property, plant, and equipment; α_1 , α_2 , and α_3 are estimated cross-sectionally based on the following model for industry-years with at least 15 observations:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \beta_1 \left(\frac{1}{A_{i,t-1}} \right) + \beta_2 \left(\frac{\Delta REV_{i,t}}{A_{i,t-1}} \right) + \beta_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t} \tag{2}$$

where $TA_{i,t}$ represents the total accruals measured by the difference between the earnings before extraordinary items and discontinued operations and cash flows from operations reported in the statement of cash flows. Discretionary accruals are the difference between actual accruals and non-discretionary accruals calculated as follows:

$$DA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - NDA_{i,t} \tag{3}$$

Consistent with prior literature, we generated three variables: the absolute value of DA (ABSDA), the income-increasing DA (DA+), and the income-decreasing DA (DA-) to measure accruals management (AM) [23].

- Real earnings management

Consistent with prior research [21–23], we used three measures to proxy for real earnings management (RM): abnormal production costs (A_PROD), related to the reduction of the cost of goods sold by overproducing inventory items; abnormal operating cash flows (A_CFO), related to the inflation of revenues through provisions of excessive

sales discounts or extended payment periods; and abnormal discretionary expenditures (A_DISX), related to the abnormal decrease of expenses by reducing R&D, selling, and other general expenditures.

A_PROD , A_CFO , and A_DISX are residuals from the following three cross-sectional regressions:

$$\frac{PROD_t}{A_{t-1}} = \gamma_0 + \gamma_1 \frac{1}{A_{t-1}} + \gamma_2 \frac{S_t}{A_{t-1}} + \gamma_3 \frac{\Delta S_t}{A_{t-1}} + \gamma_4 \frac{\Delta S_{t-1}}{A_{t-1}} + \varepsilon_t \quad (4)$$

$$\frac{CFO_t}{A_{t-1}} = \delta_0 + \delta_1 \frac{1}{A_{t-1}} + \delta_2 \frac{S_t}{A_{t-1}} + \delta_3 \frac{\Delta S_t}{A_{t-1}} + \varepsilon_t \quad (5)$$

$$\frac{DISX_t}{A_{t-1}} = \lambda_0 + \lambda_1 \frac{1}{A_{t-1}} + \lambda_2 \frac{S_{t-1}}{A_{t-1}} + \varepsilon_t \quad (6)$$

where A_{t-1} is the total assets at the end of year $t - 1$; S_t is the net sales in year t ; ΔS_t is the change in net sales from year $t - 1$ to t ; $PROD_t$ is the sum of cost of goods sold in year t and the change in inventory from year $t - 1$ to t ; CFO_t is cash flows from operating activities in year t ; $DISX_t$ is the discretionary expenditures (i.e., the sum of R&D, selling, and general and administrative expenditures) in year t .

Those companies that attempt to manipulate earnings through real transactions tend to have a higher A_PROD , a lower A_DISX , and a lower A_CFO . To avoid confusion, we multiply A_CFO and A_DISX by minus one to represent real earnings management in a consistent fashion as A_PROD , and we use NA_CFO and NA_DISX to represent them, respectively.

Following Cohen and Zarowin [22], we also generated two aggregate proxies of real earnings management by combining NA_CFO and NA_DISX to get RM1, and A_PROD and NA_DISX to get RM2, respectively, in order to capture the aggregate levels of real earnings management.

Finally, we followed Chan et al. and Badertscher [23,48] to measure the overall level of earnings management (EM) by summing accruals management (AM) and real earnings management (RM).

- Measure of earnings management combination strategies

To examine the impact of state ownership on a firm's selection of earnings management combination strategies, we followed Braam et al.'s approach [11]. We use two dummy variables to measure the major type of earnings management: real earnings management (RM_Dummy) and accruals management (AM_Dummy), respectively. RM_Dummy equals one if one of the real earnings management aggregate proxies (either RM1 or RM2) is above the industry-year median and zero otherwise [22]. AM_Dummy equals one if the company's ABSDA is above industry-year median and zero otherwise [22].

Rather than testing only on substitution between these two earnings management strategies, we examined how a firm selects different combinations of earnings management strategies. We created four indicator variables to measure the preference of a company's earnings management combination strategies: $RM_H_AM_L$ ($RM_dummy = 1$, $AM_dummy = 0$), $RM_L_AM_H$ ($RM_dummy = 0$, $AM_dummy = 1$), $RM_H_AM_H$ ($RM_dummy = 1$, $AM_dummy = 1$), and $RM_L_AM_L$ ($RM_dummy = 0$, $AM_dummy = 0$). We expect that SOEs, in particular central SOEs, will exhibit a significantly positive relationship with $RM_H_AM_L$.

- Measure of state ownership

We classified the listed companies into SOEs and non-SOEs according to the nature of firms' ultimate shareholders [4,7]. Following Wang et al. [4], we further divided SOEs into central SOEs (CSOE) and local SOEs (LSOE). Central SOEs are those enterprises that are ultimately controlled by the central government or its agencies, including enterprises controlled by the State Council, the State Assets Supervision and Administration Commission, the Ministry of Finance, the Ministry of Education, and other relevant government departments. Local SOEs are those enterprises that are ultimately controlled

by provincial and city governments or their agencies, including enterprises controlled by provincial/municipal's governments, the provincial/municipal State Asset Supervision and Administration Commission, provincial/municipal finance bureau, provincial/municipal Department of Education, and other local government departments.

- Measure of media attention and litigation

We used the total number of news reports on a firm to proxy for media attention to test the joint effects of statement ownership and media attention on a firm's selection of earnings management strategies. Following prior research, we took the natural logarithm of the total number of news report plus one to construct MEDIA [39,49,50]. To determine the number of news reports, we collected the data manually by reading articles in 14 newspapers (the 14 newspapers include the following: 21st Century Business Herald, China Securities Journal, Shanghai Securities News, Securities Daily, Securities Times, China Business News, China Business Journal, First Financial Daily, China Economic Times, China Times, Economy Daily, The Economic Observer, Financial Times, and Economic Information Daily). These selected newspapers are the most popular and the most influential media of financial and economic news in China. To control for the endogeneity issue, we use a one-year lag in the number of news reports ($MEDIA_{t-1}$) to measure the media's attention on a firm. We expect that SOEs, especially central SOEs, with high media attention are more likely to use real transactions rather than accruals to manage earnings.

To examine the joint effects of state ownership and litigation on earnings management, we used a dummy variable, LIT, to measure litigation [51,52]. LIT equals one when there is a lawsuit or a sanction against the firm and zero otherwise. We used the CSMAR database to obtain litigation data directly. We expect that SOEs, especially central SOEs, with an incidence of litigation are more likely to substitute real earnings management for accruals management.

- Control variables

Based on extant earnings management literature, we included a variety of control variables to control for the influence of other factors on earnings management. A stronger institutional environment in more developed stock exchanges may help monitor managerial behavior and decrease earnings management. Therefore, we included overseas listing (OL) in the model to indicate whether a company is also listed in foreign stock exchanges such as in NYSE, NASDAQ, or LSE. The percentage of institutional holdings (INST), using total shares held by institutions divided by total shares outstanding based on the year-end data, was used to control for the impact of institutional investors [20]. Asset size (LNA), which is the log of year-end total assets, controls for the impact of company size. A large firm's internal control might be stronger than that of small firms, reducing the opportunities for earnings management [53]. We used the leverage ratio (LEV) to control for the impact of debt covenants on earnings management. Watts [54] found that debt covenants can bring more accounting conservatism to firms, restricting the opportunistic behavior of managers. The cash to asset ratio (CA) was included due to the concern that free cash flows may affect how shareholders perceive a company's profitability and thus their investment plan, which in turn influences managerial decisions regarding earnings management. Ownership concentration (H10) was used to control for the impact of concentrated ownership structure on earnings management [55]. We also included the ROA ratio (ROA) in our models to control for the influence of earnings performance on earnings management. In addition, following Chan et al., Zang, and Krishnan et al. [20,23,56], we included the operating revenue growth ratio (MBG) and market to book ratio (MB) as control variables.

Prior research on Chinese enterprises has found that the earnings quality and management decisions of Chinese listed companies could be affected by the level of market and legal institutions' development and the degree of government power [4]. Considering that, we followed Wang et al. [4] to include three indexes: the credit market index (CMI), government decentralization index (GDI), and legal environment index (LEI), which were developed by Fan and Wang [57], to capture the impact of institutional environment on managerial behavior. Prior literature has also found that "tunneling", described as the

transfer of assets and resources between related parties, is a major tool that has been used by Chinese state-owned firms to manage their earnings [58]. We included non-operating income to control for the tunneling effects [12,59]. To control for the differences between the Shanghai and Shenzhen Stock Exchanges, we included a dummy variable SZSH as a control variable, which equals one if a firm is listed on the Shanghai Stock Exchange.

Following Liu and Lu [58], we included the following three governance variables in our models: the dual role of CEO as the chairman of board (CEOCHR), percentage of independent directors (INDDIR), and management ownership (MO). We then included an audit-related variable, Big-10 auditors (Big10), to control for the cost associated with the use of accruals management. Big10 equals one when the firm’s auditor is one of the top 10 auditors in China based on firm revenues (The market share of Big 4 international auditors in China is relatively small and thus is inappropriate to be used as a proxy for auditor quality. Considering that, we follow Wang et al. [4] to use Big10 as a control variable).

Finally, following prior studies that examine the issue of substitution between real earnings management and accruals management, we included AM (RM) as a control variable when the dependent variable was RM (AM) [23,27]. Because we obtained similar results using either RM1 or RM2 as control variables, we only present the results based on RM1.

We summarize our definitions of all variables in Table 2.

Table 2. Definition of Variables.

Variable	Definition
Dependent Variables:	
NA_CFO	The reversed level of abnormal cash flows from operations, as defined by Roychowdhury [21]
A_PROD	The level of abnormal production costs, where production costs are defined as the sum of the cost of goods sold and the change in inventories, as defined by Roychowdhury [21]
NA_DISX	The reversed level of abnormal discretionary expenses, where discretionary expenses are the sum of R&D expenses and SG&A expenses, as defined by Roychowdhury [21]
RM1	=NA_CFO + NA_DISX
RM2	=A_PROD + NA_DISX
ABSDA	The absolute value of the accruals management, with the discretionary accruals’ values calculated by using the modified Jones Model (Dechow et al. [43])
DA(+)	Income-increasing discretionary accruals
DA(−)	Income-decreasing discretionary accruals
EM1	=ABSDA + RM1
EM2	=ABSDA + RM2
RM _H _DA _L	=1 if RM_Dummy ^a = 1 and DA_Dummy ^a = 0, 0 otherwise
RM _L _DA _H	=1 if RM_Dummy = 0 and DA_Dummy = 1, 0 otherwise
RM _H _DA _H	=1 if RM_Dummy = 1 and DA_Dummy = 1, 0 otherwise
RM _L _DA _L	=1 if RM_Dummy = 0 and DA_Dummy = 0, 0 otherwise
Independent Variables:	
SOE	=1 if government is the ultimate controller, 0 otherwise
CSOE	=1 if central government is the ultimate controller, 0 otherwise
LSOE	=1 if local government is the ultimate controller, 0 otherwise
MEDIA	=Log (1 + Number of total news report at year <i>t</i> − 1)
LIT	=1 if a company is in litigation or a sanction that year, 0 otherwise
Control Variables:	
ROA	=Net profit/year-end total assets
MBG	=(Operating sales of current year/operating sales of last year) − 1
LEV	=Year-end total liabilities/year-end total assets
LNA	Natural logarithm of year-end total assets
OL	=1 if the company is listed in both China stock exchanges and foreign stock exchanges
MB	=Market value/book value
NOI	=Non-operating income/sales
INST	=Total shares held by institutions/Total shares outstanding at year-end
H10	The sum of the square of the holding percentage of the ten largest shareholders
CEOCHR	=1 if firms’ chairman and CEO are the same person, 0 otherwise
INDDIR	The proportion of the number of independent directors to the board of directors

Table 2. Cont.

Variable	Definition
MO	shares of common stocks held by top management
Big 10	=1 if the firm is audited by a big 10 audit firm, 0 otherwise.
CMI	Fan and Wang [57] credit market index
GDI	Fan and Wang [57] government decentralization index
LEI	Fan and Wang [57] legal environment index
SZSH	=1 if stock is listed on Shanghai stock exchange, 0 otherwise

^a RM_Dummy equals 1 if the company’s RM1 or RM2 is above the median of industry-year and 0 otherwise. DA_Dummy equals 1 if the company’s ABSDA is above the median of industry-year and 0 otherwise.

3.2.2. Regression Models

To examine the effect of state ownership (SOEs vs. non-SOEs) on earnings management combination strategies (Hypothesis 1a), we developed the following logistic model:

$$\text{Earnings Management Strategy} = \zeta_0 + \zeta_1 \text{SOE} + \zeta_i \sum \text{Controls} + \text{Year Fixed Effects} + \text{Industry Fixed Effects} + \varepsilon \tag{7}$$

where Earnings Management Strategy is one of the following measures: RM_H_DA_L, RM_L_DA_H, RM_H_DA_H, and RM_L_DA_L. To examine the impact of state ownership on specific types of earnings management strategies, we developed the following model:

$$\text{Earnings Management} = \eta_0 + \eta_1 \text{SOE} + \eta_i \sum \text{Controls} + \text{Year Fixed Effects} + \text{Industry Fixed Effects} + \varepsilon \tag{8}$$

where Earnings Management is one of the following measures: ABSDA, DA(+), DA(−), NA_CFO, A_PROD, NA_DISX, RM1, RM2, EM1, and EM2. To further examine the differences between central SOEs and local SOEs (Hypothesis 1b) in their choices of earnings management strategies, we developed the following model:

$$\begin{aligned} \text{Earnings Management Strategy (Earnings Management)} \\ = \theta_0 + \theta_1 \text{CSOE} + \theta_2 \text{LSOE} + \theta_i \sum \text{Controls} \\ + \text{Year Fixed Effects} + \text{Industry Fixed Effects} + \varepsilon \end{aligned} \tag{9}$$

To examine how media attention and litigation may interact with state ownership to impact earnings management strategies (Hypothesis 2a, 2b and Hypothesis 3a, 3b), we developed the following models:

$$\begin{aligned} \text{Earnings Management Strategy (Earnings Management)} \\ = \iota_0 + \iota_1 \text{SOE} + \iota_2 \text{MEDIA (LIT)} + \iota_3 \text{SOE} * \text{MEDIA (LIT)} \\ + \iota_i \sum \text{Controls} + \text{Year Fixed Effects} \\ + \text{Industry Fixed Effects} + \varepsilon \end{aligned} \tag{10}$$

$$\begin{aligned} \text{Earnings Management Strategy (Earnings Management)} \\ = \kappa_0 + \kappa_1 \text{CSOE} + \kappa_2 \text{LSOE} + \kappa_3 \text{MEDIA (LIT)} + \kappa_4 \text{CSOE} \\ * \text{MEDIA (LIT)} + \kappa_5 \text{LSOE} * \text{MEDIA (LIT)} + \kappa_i \sum \text{Controls} \\ + \text{Year Fixed Effects} + \text{Industry Fixed Effects} + \varepsilon \end{aligned} \tag{11}$$

Controls are the control variables from Table 2. Following Chan et al. and Cohen et al. [23,27], in Models (8)–(11), we included real earnings management (measured by RM1) in Controls when accruals management (e.g., ABSDA) is regressed, and vice versa.

4. Results

4.1. Descriptive Statistics

Table 3 presents descriptive statistics of all variables. To avoid the distortions caused by extreme values on our results, we winsorized the dependent variables and control variables at the top and bottom 1%.

Table 3. Summary Statistics.

Variable	Obs.	Mean	STD	Min.	Max.	25%	50%	75%
ABSDA	11,905	0.065	0.099	0.000	4.675	0.019	0.042	0.081
DA(+)	6406	0.070	0.117	0.000	4.675	0.020	0.044	0.086
DA(−)	5499	−0.059	0.071	−1.204	0.000	−0.076	−0.040	−0.017
NA_CFO	11,905	−0.003	0.115	−1.796	3.849	−0.049	−0.002	0.040
A_PROD	11,905	−0.004	0.432	−13.754	39.330	−0.063	0.006	0.064
NA_DISX	11,905	−0.001	0.152	−3.715	6.407	−0.018	0.012	0.041
RM1	11,905	−0.004	0.205	−3.725	6.845	−0.060	0.008	0.067
RM2	11,905	−0.005	0.471	−16.347	37.619	−0.076	0.019	0.101
EM1	11,905	0.061	0.241	−3.587	8.389	−0.015	0.048	0.120
EM2	11,905	0.060	0.482	−15.723	38.115	−0.031	0.067	0.162
RM _H _DA _L	11,905	0.293	0.455	0.000	1.000	0.000	0.000	1.000
RM _L _DA _H	11,905	0.180	0.384	0.000	1.000	0.000	0.000	0.000
RM _H _DA _H	11,905	0.320	0.467	0.000	1.000	0.000	0.000	1.000
RM _L _DA _L	11,905	0.206	0.405	0.000	1.000	0.000	0.000	0.000
SOE	11,905	0.634	0.482	0.000	1.000	0.000	1.000	1.000
CSOE	11,905	0.207	0.405	0.000	1.000	0.000	0.000	0.000
LSOE	11,905	0.428	0.495	0.000	1.000	0.000	0.000	1.000
MEDIA	1816	0.713	0.417	0.000	2.053	0.477	0.699	1.000
LIT	11,905	0.109	0.312	0.000	1.000	0.000	0.000	0.000
ROA	11,905	0.039	0.057	−0.775	0.477	0.013	0.033	0.062
MBG	11,905	0.354	4.909	−0.984	400.677	−0.022	0.108	0.274
LEV	11,905	0.507	0.191	0.007	1.352	0.372	0.516	0.649
LNA	11,905	22.480	1.345	17.641	28.509	21.573	22.327	23.263
OL	11,905	0.018	0.133	0.000	1.000	0.000	0.000	0.000
MB	11,905	4.210	21.543	0.182	2011.634	1.699	2.599	4.216
NOI	11,905	0.010	0.181	−15.122	7.824	0.000	0.003	0.010
INST	11,905	7.948	8.987	0.000	75.495	1.620	4.798	11.013
H10	11,905	0.175	0.128	0.001	0.810	0.075	0.142	0.246
CEOCHR	11,905	0.134	0.340	0.000	1.000	0.000	0.000	0.000
INDDIR	11,905	0.366	0.054	0.000	0.800	0.333	0.333	0.385
MO	11,905	0.007	0.052	0.000	1.578	0.000	0.000	0.000
Big10	11,905	0.495	0.500	0.000	1.000	0.000	0.000	1.000
CMI	11,905	6.175	1.758	1.270	11.930	4.740	6.870	7.450
GDI	11,905	8.762	1.461	−4.660	10.650	8.230	9.050	9.690
LEI	11,905	10.726	5.548	0.180	19.890	5.990	8.180	16.270
SZSH	11,905	0.652	0.476	0.000	1.000	0.000	1.000	1.000

All variables are defined in Table 2.

The minimum value of ABSDA is less than 0.001, while the maximum value reaches 4.675, with a mean of 0.065, which is lower than the value in prior research based on the earlier years' data of Chinese stock markets [12,13]. This may indicate that Chinese listed companies have reduced the use of accruals management in recent years. On the contrary, the mean values of three proxies of real earnings management are all higher than that of earlier years' data of Chinese stock market [14]. Table 4 reports the comparative results of the mean values of earnings management in central SOEs, local SOEs, and non-SOEs.

Consistent with our expectations, the mean values of accruals management of central SOEs and local SOEs are both lower than that of non-SOEs. As for real earnings management (including NA_CFO, A_PROD, NA_DISX, RM1, and RM2), central SOEs appear to be at the highest level, followed by the local SOEs and non-SOEs. From Table 4, we find that the mean value of RM_H_DA_L, of both central SOEs and local SOEs, is significantly

higher than that of non-SOEs, while the mean value of $RM_L_DA_H$ is significantly lower than that of non-SOE, showing that SOEs tend to substitute for accruals management with real earnings management. Such a difference can also be observed between central SOEs and local SOEs.

Table 5 shows the correlation analysis of dependent variables and test variables. Most of the correlations are consistent with our previous estimations. We examine the variance inflation factors (VIFs) of the independent variables to check for multicollinearity. The VIF values for all variables do not exceed 4, indicating that there is no serious multicollinearity issue in our models.

4.2. Regression Results

4.2.1. SOEs vs. Non-SOEs

To test whether SOEs are more likely to engage real earnings management to substitute for accruals management (Hypothesis 1a), we followed Braam et al.'s [11] approach and compared the difference in the selection of earnings management strategies between SOEs and non-SOEs. The results are presented in Table 6.

From column (1), we can see that SOE is significantly positively associated with $RM_H_DA_L$ (coefficient = 0.113, p value < 0.05), showing that SOEs are more likely to substitute real earnings management for accruals management, supporting our Hypothesis 1a. As expected, due to more scrutiny and criticism from outsiders, such as regulators, auditors, and the media, SOEs prefer to use real earnings management to avoid scrutiny and penalties.

To test Hypothesis 1a further, we examined the impact of state ownership on different types of earnings management strategies and on the overall level of earnings management. Table 7 presents the results.

The test results of the overall levels of earnings management are presented in columns (9) and (10), which show that there is no significant difference between SOEs and non-SOEs regarding the overall level of earnings management (coefficient = -0.003 for both, p value > 0.10). These results show that SOEs are as equally likely to engage in earnings management as non-SOEs. By looking further into the results, we found that SOEs are more likely to substitute real earnings management for accruals management to avoid scrutiny than non-SOEs.

Column (1) shows that SOEs are negatively associated with ABSDA (coefficient = -0.006 , p value < 0.01), indicating that SOEs have lower accruals management than non-SOEs. Furthermore, compared with non-SOEs, SOEs have significantly less income-increasing discretionary accruals (coefficient = -0.005 , p value < 0.01) but more income-decreasing discretionary accruals (coefficient = 0.003, p value < 0.05). Overall, SOEs are less likely to use accruals management than non-SOEs. As for real earnings management, with results presented in columns (4) to (8), SOEs seem to have more NA_CFO and A_PROD than non-SOEs (coefficient = 0.005 for both, p values < 0.05). These results provide further support to our Hypothesis 1a that SOEs are more likely to substitute real earnings management for accruals management than non-SOEs.

4.2.2. Central SOEs vs. Local SOEs

We performed an additional test to examine how the central SOEs differ from local SOEs in the trade-off or combination of earnings management strategies, with results presented in Table 8. We used CSOE to represent central SOEs and use LSOE to represent local SOEs, with non-SOEs as the default comparison.

Compared to other firms, central SOEs are more likely to use $RM_H_DA_L$ strategy (coefficient = 0.240, p value < 0.01). At the same time, central SOEs are less likely to use $RM_L_DA_H$ strategy. These results indicate that, compared with local SOEs and non-SOEs, central SOEs are more likely to substitute real earnings management for accruals management to reduce the risk of having earnings management exposed and to avoid the scrutiny and criticism from the public and media. This result supports our Hypothesis 1b.

Table 4. Mean Values Partitioned by Ownership Type.

	Mean CSOE	Mean LSOE	Mean NSOE	Mean Difference (CSOE-NSOE)	Mean Difference (LSOE-NSOE)	Mean Difference (CSOE-LSOE)
ABSDA	0.061	0.059	0.075	−0.014 ***	−0.016 ***	0.002
DA(+)	0.063	0.062	0.083	−0.021 ***	−0.021 ***	0.001
DA(−)	−0.058	−0.055	−0.065	0.007 **	0.010 ***	−0.003
NA_CFO	0.004	−0.004	−0.006	0.010 ***	0.002	0.008 ***
A_PROD	0.017	−0.006	−0.014	0.031 **	0.008	0.023 ***
NA_DISX	0.017	−0.003	−0.009	0.026 ***	0.005 **	0.021 ***
RM1	0.022	−0.007	−0.014	0.036 ***	0.007 *	0.029 ***
RM2	0.034	−0.010	−0.023	0.057 ***	0.013	0.044 ***
EM1	0.082	0.052	0.060	0.022 ***	−0.009 *	0.031 ***
EM2	0.095	0.049	0.052	0.042 ***	−0.003	0.046 ***
RM _H _DA _L	0.338	0.299	0.261	0.077 ***	0.038 ***	0.038 ***
RM _L _DA _H	0.158	0.179	0.194	−0.037 ***	−0.016 *	−0.021 **
RM _H _DA _H	0.330	0.307	0.331	−0.001	−0.024 **	0.023 **
RM _L _DA _L	0.175	0.215	0.214	−0.039 ***	0.001	−0.040 ***
MEDIA	0.793	0.705	0.673	0.121 ***	0.032	0.088 ***
LIT	0.120	0.101	0.113	0.008	−0.012 *	0.020 ***

*, **, *** represent significance at the level of 0.10, 0.05, and 0.01, respectively. All variables are defined in Table 2.

Table 5. Correlation Matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. ABSDA	1	0.110	0.068	0.031	0.099	0.070	0.418	0.342	0.517	0.340	0.601	0.434	−0.013	−0.014	−0.001	0.029	0.020
2. NA_CFO	0.348	1	0.443	0.219	0.832	0.406	0.761	0.414	0.170	0.339	0.383	0.308	0.076	0.095	−0.005	−0.029	0.055
3. A_PROD	0.025	0.097	1	0.572	0.641	0.956	0.608	0.895	0.341	0.437	0.402	0.429	0.033	0.061	−0.019	0.074	0.022
4. NA_DISX	0.053	0.166	0.095	1	0.660	0.759	0.626	0.717	0.335	0.365	0.308	0.382	−0.033	0.012	− 0.041	0.091	0.036
5. RM1	0.155	0.682	0.125	0.834	1	0.709	0.914	0.698	0.314	0.460	0.465	0.449	0.041	0.089	−0.035	0.071	0.065
6. RM2	0.006	0.143	0.947	0.410	0.384	1	0.671	0.936	0.373	0.455	0.417	0.463	0.010	0.056	−0.036	0.087	0.024
7. EM1	0.541	0.723	0.117	0.688	0.915	0.329	1	0.768	0.121	0.313	0.622	0.555	0.032	0.072	−0.029	0.055	0.062
8. EM2	0.210	0.211	0.931	0.390	0.407	0.979	0.433	1	0.199	0.355	0.566	0.536	0.017	0.054	−0.029	0.068	0.033
9. RM _H _DA _L	0.287	0.091	0.080	0.176	0.181	0.130	0.037	0.069	1	0.299	0.438	0.325	0.034	0.051	−0.009	−0.039	0
10. RM _L _DA _H	0.153	0.289	0.150	0.223	0.327	0.210	0.216	0.174	0.302	1	0.326	0.242	−0.008	−0.012	0.002	0.001	0.047
11. RM _H _DA _H	0.352	0.301	0.145	0.163	0.289	0.186	0.390	0.254	0.442	0.322	1	0.354	0.004	0.005	0	−0.005	0.031
12. RM _L _DA _L	0.229	0.174	0.114	0.174	0.227	0.161	0.287	0.204	0.328	0.239	0.350	1	−0.035	0.052	0.009	0.048	0.009
13. SOE	0.076	0.019	0.017	0.039	0.039	0.028	0.002	0.012	0.054	0.028	− 0.017	−0.015	1	0.374	0.645	0.062	−0.016
14. CSOE	0.023	0.031	0.025	0.062	0.063	0.043	0.045	0.037	0.050	0.030	0.010	0.040	0.387	1	0.468	0.096	0.032
15. LSOE	0.056	−0.007	−0.004	−0.013	−0.014	−0.008	0.034	0.019	0.012	−0.003	0.025	0.018	0.656	0.441	1	−0.02	− 0.042
16. MEDIA	0.038	−0.033	0.078	0.103	0.088	0.099	0.060	0.081	− 0.040	0.003	0	0.042	0.069	0.100	−0.017	1	0.036
17. LIT	0.020	−0.001	0.006	0.021	0.015	0.013	0.021	0.016	0.004	−0.005	0.019	0.022	−0.009	0.018	0.024	0.034	1

Spearman (Pearson) correlation coefficients are above (below) the diagonal. Bold values are significant at 0.10 level or better (two-tailed). All variables are defined in Table 2.

Table 6. The Effect of State Ownership on Earnings Management Combination Strategies.

Dependent Variables	(1)	(2)	(3)	(4)
	RM _H _DA _L	RM _L _DA _H	RM _H _DA _H	RM _L _DA _L
SOE	0.113 ** (0.047)	0.011 (0.056)	−0.120 *** (0.045)	0.013 (0.052)
ROA	−9.446 *** (0.548)	10.957 *** (0.614)	−6.330 *** (0.497)	9.272 *** (0.592)
MBG	−0.283 *** (0.053)	0.321 *** (0.047)	0.104 ** (0.042)	−0.134 ** (0.053)
LEV	−0.015 (0.152)	0.008 (0.182)	0.519 *** (0.144)	−0.426 ** (0.172)
LNA	0.169 *** (0.027)	−0.105 *** (0.031)	−0.043 * (0.025)	−0.094 *** (0.030)
OL	−0.606 *** (0.174)	0.258 (0.200)	−0.149 (0.167)	0.723 *** (0.168)
MB	−0.066 *** (0.010)	0.047 *** (0.010)	0.015 * (0.008)	−0.054 *** (0.011)
NOI	4.037 *** (0.756)	−4.665 *** (1.063)	1.895 *** (0.721)	−3.877 *** (0.997)
INST	−0.018 *** (0.003)	0.017 *** (0.003)	−0.010 *** (0.003)	0.016 *** (0.003)
H10	−0.584 *** (0.194)	0.037 (0.233)	0.249 (0.184)	0.331 (0.215)
CEOCHR	−0.203 *** (0.066)	−0.022 (0.076)	0.052 (0.061)	0.181 *** (0.069)
INDDIR	0.268 (0.413)	−0.430 (0.515)	0.145 (0.398)	−0.342 (0.473)
MO	0.732 (0.860)	1.740 ** (0.831)	−1.895 ** (0.836)	−0.707 (0.861)
Big10	−0.049 (0.046)	0.120 ** (0.054)	−0.122 *** (0.043)	0.120 ** (0.050)
CMI	0.054 *** (0.020)	−0.062 ** (0.025)	0.007 (0.020)	−0.021 (0.023)
GDI	−0.001 (0.029)	−0.034 (0.034)	0.047 * (0.028)	−0.043 (0.033)
LEI	−0.014 ** (0.007)	0.017 ** (0.008)	−0.007 (0.006)	0.018 ** (0.008)
SZSH	0.066 (0.046)	0.009 (0.055)	−0.073 * (0.044)	0.044 (0.052)
YEAR Controls	Yes	Yes	Yes	Yes
Industry Controls	Yes	Yes	Yes	Yes
_cons	−4.072 *** (0.608)	0.733 (0.730)	−0.280 (0.584)	0.875 (0.689)
Obs.	11,905	11,905	11,905	11,905
pseudo R ²	0.061	0.080	0.029	0.050

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Standard errors are in parenthesis below the regression coefficients. All variables are defined in Table 2.

Moreover, our results indicate that central SOEs are more likely to use the combination strategy of RM_H_DA_H than local SOEs (CSOE and LSOE coefficients = −0.01 and −0.170, p value > 0.1 and <0.01, respectively) but less likely to use the strategy of RM_L_DA_L than local SOEs (CSOE and LSOE coefficients = −0.181 and 0.094, p value < 0.05 and <0.10, respectively). Prior research found that companies with severe financial problems might choose to increase earnings through both accruals and real earnings management [60,61]. As argued by Zhang et al. [37], compared with local SOEs, managers of central SOEs need to rely more on corporate performance to get promotional opportunities. The pressure on central SOEs to meet earnings goals might have pushed some managers to use extreme ways to manipulate their financial results. Such a finding should receive close attention from the regulators in China.

Table 7. The Effect of State Ownership on Real Earnings Management and Accruals Management.

Dependent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ABSDA	DA(+)	DA(−)	NA_CFO	A_PROD	NA_DISX	RM1	RM2	EM1	EM2
SOE	−0.006 *** (0.001)	−0.005 *** (0.001)	0.003 ** (0.001)	0.005 *** (0.002)	0.005 ** (0.002)	−0.001 (0.002)	0.004 (0.002)	0.005 (0.004)	−0.003 (0.003)	−0.003 (0.004)
Year & Industry & Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.072 *** (0.017)	0.067 *** (0.018)	−0.105 *** (0.017)	0.001 (0.021)	−0.258 *** (0.032)	−0.085 *** (0.020)	−0.082 ** (0.032)	−0.334 *** (0.047)	0.014 (0.039)	−0.239 *** (0.053)
Obs.	11,905	6406	5499	11,905	11,905	11,905	11,905	11,905	11,905	11,905
adj. R ²	0.138	0.449	0.342	0.138	0.239	0.141	0.177	0.216	0.105	0.154

***, and ** indicate statistical significance at the 1% and 5% levels, respectively. Standard errors are in parenthesis below the regression coefficients. All variables are defined in Table 2.

Table 8. The Effect of State Ownership Type on Earnings Management Combination Strategies.

Dependent Variables	(1)	(2)	(3)	(4)
	RM _H _DA _L	RM _L _DA _H	RM _H _DA _H	RM _L _DA _L
CSOE	0.240 *** (0.061)	−0.130 * (0.075)	−0.010 (0.059)	−0.181 ** (0.071)
LSOE	0.055 (0.051)	0.073 (0.060)	−0.170 *** (0.048)	0.094 * (0.055)
ROA	−9.366 *** (0.548)	10.901 *** (0.614)	−6.263 *** (0.497)	9.178 *** (0.593)
MBG	−0.283 *** (0.052)	0.322 *** (0.047)	0.104 ** (0.042)	−0.134 ** (0.053)
LEV	0.018 (0.152)	−0.008 (0.182)	0.544 *** (0.145)	−0.453 *** (0.173)
LNA	0.160 *** (0.027)	−0.100 *** (0.031)	−0.050* (0.025)	−0.085 *** (0.030)
OL	−0.628 *** (0.174)	0.283 (0.200)	−0.170 (0.168)	0.753 *** (0.169)
MB	−0.069 *** (0.010)	0.049 *** (0.010)	0.013 (0.008)	−0.050 *** (0.011)
NOI	4.091 *** (0.757)	−4.735 *** (1.062)	1.939 *** (0.721)	−3.972 *** (0.997)
INST	−0.018 *** (0.003)	0.017 *** (0.003)	−0.010 *** (0.003)	0.016 *** (0.003)
H10	−0.585 *** (0.195)	0.039 (0.233)	0.250 (0.184)	0.332 (0.215)
CEOCHR	−0.188 *** (0.066)	−0.038 (0.076)	0.064 (0.061)	0.160 ** (0.069)
INDDIR	0.265 (0.413)	−0.431 (0.515)	0.146 (0.398)	−0.344 (0.474)
MO	0.731 (0.860)	1.755 ** (0.831)	−1.899 ** (0.836)	−0.676 (0.860)
Big10	−0.064 (0.046)	0.136 ** (0.054)	−0.135 *** (0.044)	0.141 *** (0.051)
CMI	0.051 ** (0.020)	−0.057 ** (0.025)	0.004 (0.020)	−0.014 (0.023)
GDI	0.008 (0.029)	−0.044 (0.035)	0.055 ** (0.028)	−0.058 * (0.033)
LEI	−0.015 ** (0.007)	0.018 ** (0.008)	−0.008 (0.006)	0.020 *** (0.008)
SZSH	0.072 (0.046)	0.003 (0.055)	−0.069 (0.044)	0.036 (0.052)
YEAR Controls	Yes	Yes	Yes	Yes
Industry Controls	Yes	Yes	Yes	Yes
_cons	−3.936 *** (0.610)	0.682 (0.731)	−0.182 (0.585)	0.764 (0.691)
Obs.	11,905	11,905	11,905	11,905
pseudo R ²	0.062	0.080	0.030	0.051

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Standard errors are in parenthesis below the regression coefficients. All variables are defined in Table 2.

Table 9 presents the results of different types of earnings management strategies with specifics. Column (1) shows that both central and local SOEs are significantly associated with lower discretionary accruals (CSOE and LSOE coefficients = −0.004 and −0.006, p value < 0.05 and <0.01, respectively). Our untabulated t -test result shows that the coefficient of central SOEs is not significantly different from that of local SOEs.

Columns (4) to (8) list the results of the effect of state ownership type on real earnings management. One can see that, compared with other firms, central SOEs are more likely to use all three types of real earnings management including: abnormal cash

flows (NA_CFO coefficient = 0.010, p value < 0.01), abnormal overproductions (A_PROD coefficient = 0.017, p value < 0.01), and abnormal discretionary expenditures (NA_DISX coefficient = 0.008, p value < 0.01), showing that central SOEs engage more real earnings management than local SOEs and non-SOEs. All the real earnings management coefficients of central SOEs are higher than those of local SOEs, including both aggregate measures, providing further evidence to Hypothesis 1b that central SOEs are more likely to use real earnings management than local SOEs. Columns (9) and (10) present the results of the aggregate level of earnings management and show that central SOEs are more likely to manage earnings than local SOEs, which is primarily driven by the high level of real earnings management in central SOEs.

Overall, the results show that central SOEs are more likely to substitute real earnings management for accruals management than other firms. When choosing service suppliers or other business partners, firms should pay close attention to the real earnings management issue in central SOEs.

4.2.3. Joint Effects of State Ownership and Media Attention on Earnings Management

To look further into the reasons why SOEs, especially central SOEs, are more likely to use the trade-off strategy by substituting real earnings management for accruals management, we proposed Hypothesis 2a and 2b to examine whether SOEs, especially central SOEs, with high media attention are more likely to use real earnings management to reach earnings goals. Table 10 presents the results.

Panel A of Table 10 shows that those SOEs with high media attention are more likely to engage the trade-off strategy of $RM_{H_DA_L}$ (coefficient = 0.787, p -value < 0.01). Consistent with our expectation in Hypothesis 2a, SOEs with high media attention might be more concerned with their reputation loss if their earnings management were exposed. Such a reputation loss will affect managers' compensations and hurt their chance of get political promotions [39,62]. Therefore, SOEs with high media attention are more likely to use the type of earnings management that receives less scrutiny from outside reviewers, e.g., real earnings management, even though it may harm the company in the long term. In specific, SOEs with high media attention exhibit higher levels of real earnings management in all three categories.

Panel B of Table 10 presents the test results of the difference between central SOEs and local SOEs in terms of earnings management strategies. Supporting our prediction in Hypothesis 2b, among central SOEs, local SOEs, and non-SOEs, those central SOEs that are with high media attention are most likely to use the trade-off strategy of $RM_{H_DA_L}$ (coefficient = 0.999, p -value < 0.01), while they are less likely to use the $RM_{L_DA_H}$ strategy (coefficient = -0.875 , p -value < 0.01). Compared with local SOEs and non-SOEs, central SOEs have the strongest political connections, which provide more political promotion opportunities to their executives. They are also often the focus of the public criticism and the media coverage, making them more sensitive to the public exposure of earnings management. Thus, the central SOEs with high media attention are most likely to substitute real earnings management for accruals management to reduce the chance of getting caught while achieving their earnings goals.

4.2.4. Joint Effects of State Ownership and Litigation on Earnings Management

To examine whether there is a joint effect of state ownership and litigation on earnings management, we proposed Hypothesis 3a&b and anticipate that the SOEs, especially central SOEs, with an incidence of litigation are more likely to engage the trade-off strategy of using high real earnings management and low accruals management. Table 11 presents the results.

Table 9. The Effect of State Ownership Type on Real Earnings Management and Accruals Management.

Dependent Variables	(1) ABSDA	(2) DA(+)	(3) DA(−)	(4) NA_CFO	(5) A_PROD	(6) NA_DISX	(7) RM1	(8) RM2	(9) EM1	(10) EM2
CSOE	−0.004 ** (0.002)	−0.006 *** (0.002)	−0.000 (0.002)	0.010 *** (0.002)	0.017 *** (0.003)	0.008 *** (0.002)	0.019 *** (0.003)	0.027 *** (0.005)	0.016 *** (0.004)	0.024 *** (0.005)
LSOE	−0.006 *** (0.001)	−0.004 *** (0.002)	0.004 *** (0.001)	0.003 * (0.002)	−0.000 (0.003)	−0.005 *** (0.002)	−0.003 (0.003)	−0.006 (0.004)	−0.011 *** (0.003)	−0.015 *** (0.004)
Year & Industry & Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.073 *** (0.017)	0.066 *** (0.018)	−0.108 *** (0.017)	0.004 (0.021)	−0.249 *** (0.032)	−0.078 *** (0.020)	−0.070 ** (0.032)	−0.316 *** (0.047)	0.029 (0.039)	−0.218 *** (0.053)
Obs.	11,905	6406	5499	11,905	11,905	11,905	11,905	11,905	11,905	11,905
adj. R ²	0.138	0.449	0.343	0.139	0.241	0.144	0.181	0.220	0.109	0.158

*, **, *** represent significance at the level of 0.10, 0.05, and 0.01, respectively. Standard errors are in parenthesis below the regression coefficients. All variables are defined in Table 2.

Table 10. The Joint Effects of State Ownership and Media Attention on Earnings Management. Panel (A) Regressions on SOEs, Panel (B) Regressions on CSOEs and LSOEs.

(A)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	RM _H _ DA _L	RM _L _ DA _H	RM _H _ DA _H	RM _L _ DA _L	ABSDA	DA+	DA−	NA_CFO	A_PROD	NA_DISX	RM1	RM2
SOE	−0.466 ** (0.226)	0.625 ** (0.284)	0.058 (0.217)	0.047 (0.257)	0.007 (0.006)	0.006 (0.006)	−0.003 (0.007)	−0.009 (0.008)	−0.024 ** (0.011)	−0.018 *** (0.007)	−0.027 ** (0.012)	−0.044 *** (0.017)
MEDIA	−1.053 *** (0.260)	0.586 * (0.305)	0.242 (0.238)	0.524 * (0.270)	0.010 (0.007)	0.015 ** (0.007)	0.003 (0.008)	−0.011 (0.009)	−0.047 *** (0.012)	−0.036 *** (0.008)	−0.048 *** (0.013)	−0.086 *** (0.018)
MEDIA_SOE	0.787 *** (0.294)	−0.723 ** (0.344)	−0.168 (0.270)	−0.163 (0.308)	−0.006 (0.007)	−0.004 (0.007)	0.009 (0.009)	0.022 ** (0.010)	0.034 ** (0.014)	0.016 * (0.009)	0.038 *** (0.014)	0.053 ** (0.021)
Year & Industry & Control Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1816	1816	1816	1816	1816	1024	792	1816	1816	1816	1816	1816
pseudo R ² or adj. R ²	0.090	0.117	0.038	0.054	0.134	0.529	0.317	0.176	0.313	0.212	0.255	0.302

Table 10. Cont.

(B)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	RM _H – DA _L	RM _L – DA _H	RM _H –DA _H	RM _L –DA _L	ABS _{DA}	DA+	DA–	NA_CFO	A_PROD	NA_DISX	RM1	RM2
C _{SOE}	−0.510 * (0.310)	0.717 * (0.370)	0.150 (0.296)	−0.037 (0.357)	0.013 (0.008)	0.010 (0.008)	−0.000 (0.010)	0.008 (0.011)	−0.021 (0.015)	−0.017 * (0.010)	−0.009 (0.016)	−0.041 * (0.023)
L _{SOE}	−0.421 * (0.242)	0.577 * (0.307)	0.026 (0.233)	0.060 (0.276)	0.004 (0.006)	0.002 (0.007)	−0.004 (0.007)	−0.015 * (0.009)	−0.023 * (0.012)	−0.017 ** (0.007)	−0.032 *** (0.012)	−0.042 ** (0.018)
MEDIA	−1.042 *** (0.260)	0.582 * (0.305)	0.244 (0.238)	0.516 * (0.270)	0.010 (0.007)	0.015 ** (0.006)	0.003 (0.008)	−0.011 (0.009)	−0.046 *** (0.012)	−0.035 *** (0.008)	−0.047 *** (0.013)	−0.085 *** (0.018)
MEDIA_C _{SOE}	0.999 *** (0.367)	−0.875 ** (0.443)	−0.214 (0.346)	−0.333 (0.414)	−0.013 (0.010)	−0.014 (0.009)	0.001 (0.012)	0.013 (0.013)	0.048 *** (0.018)	0.029 *** (0.011)	0.042 ** (0.018)	0.079 *** (0.026)
MEDIA_L _{SOE}	0.637 ** (0.318)	−0.647 * (0.371)	−0.157 (0.292)	−0.065 (0.331)	−0.002 (0.008)	0.003 (0.008)	0.012 (0.009)	0.025 ** (0.011)	0.025 (0.015)	0.008 (0.009)	0.031 ** (0.015)	0.035 (0.022)
Year & Industry &Control Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1816	1816	1816	1816	1816	1024	792	1816	1816	1816	1816	1816
pseudo R ² or adj. R ²	0.091	0.117	0.038	0.056	0.135	0.532	0.319	0.179	0.316	0.219	0.262	0.307

*, **, *** represent significance at the level of 0.10, 0.05, and 0.01, respectively. Standard errors are in parenthesis below the regression coefficients. All variables are defined in Table 2.

Table 11. The Joint Effects of State Ownership and Litigation on Earnings Management. Panel (A) Regressions on SOEs, Panel (B) Regressions on CSOEs and LSOEs.

(A)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	RM _H – DA _L	RM _L – DA _H	RM _H – DA _H	RM _L –DA _L	ABS _{DA}	DA+	DA–	NA_CFO	A_PROD	NA_DISX	RM1	RM2
S _{OE}	0.079 (0.050)	0.058 (0.059)	−0.138 *** (0.047)	0.043 (0.054)	−0.006 *** (0.001)	−0.005 *** (0.001)	0.003 ** (0.001)	0.005 *** (0.002)	0.004 (0.003)	−0.001 (0.002)	0.003 (0.003)	0.003 (0.004)
LIT	−0.215 * (0.118)	0.251 ** (0.125)	−0.028 (0.105)	0.088 (0.123)	0.004 (0.003)	0.004 (0.003)	−0.001 (0.003)	−0.005 (0.004)	−0.005 (0.006)	0.003 (0.004)	−0.004 (0.006)	−0.005 (0.009)
LIT_S _{OE}	0.318 ** (0.144)	−0.421 ** (0.165)	0.145 (0.132)	−0.286 * (0.160)	0.002 (0.004)	−0.003 (0.004)	−0.004 (0.004)	0.004 (0.005)	0.007 (0.007)	0.004 (0.005)	0.010 (0.007)	0.015 (0.011)
Year & Industry &Control Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	11,905	11,905	11,905	11,905	11,905	6406	5499	11,905	11,905	11,905	11,905	11,905

Table 11. Cont.

(A)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	RM _H _ DA _L	RM _L _ DA _H	RM _H _ DA _H	RM _L _ DA _L	ABS _{DA}	DA ₊	DA _−	NA_CFO	A_PROD	NA_DISX	RM1	RM2
pseudo R ² or adj. R ²	0.061	0.080	0.029	0.050	0.138	0.450	0.342	0.138	0.239	0.141	0.178	0.217
(B)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	RM _H _ DA _L	RM _L _ DA _H	RM _H _ DA _H	RM _L _ DA _L	ABS _{DA}	DA ₊	DA _−	NA_CFO	A_PROD	NA_DISX	RM1	RM2
C _{SOE}	0.199 *** (0.065)	−0.077 (0.079)	−0.036 (0.062)	−0.128 * (0.074)	−0.004 ** (0.002)	−0.005 *** (0.002)	0.001 (0.002)	0.010 *** (0.002)	0.016 *** (0.003)	0.008 *** (0.002)	0.017 *** (0.003)	0.024 *** (0.005)
L _{SOE}	0.026 (0.053)	0.117 * (0.063)	−0.183 *** (0.050)	0.113 * (0.058)	−0.006 *** (0.001)	−0.004 *** (0.002)	0.004 *** (0.002)	0.003 (0.002)	−0.001 (0.003)	−0.005 *** (0.002)	−0.004 (0.003)	−0.007 * (0.004)
LIT	−0.212 * (0.118)	0.248 ** (0.125)	−0.026 (0.105)	0.083 (0.123)	0.004 (0.003)	0.004 (0.003)	−0.001 (0.003)	−0.005 (0.004)	−0.005 (0.006)	0.003 (0.004)	−0.004 (0.006)	−0.005 (0.009)
LIT_C _{SOE}	0.362 ** (0.178)	−0.436 * (0.226)	0.155 (0.168)	−0.437 * (0.227)	0.004 (0.005)	−0.001 (0.006)	−0.011 ** (0.005)	0.003 (0.006)	0.006 (0.009)	0.005 (0.006)	0.008 (0.009)	0.016 (0.014)
LIT_L _{SOE}	0.273 * (0.157)	−0.395 ** (0.182)	0.123 (0.146)	−0.200 (0.173)	−0.000 (0.004)	−0.003 (0.005)	0.000 (0.004)	0.004 (0.005)	0.006 (0.008)	0.003 (0.005)	0.009 (0.008)	0.011 (0.012)
Year & Industry &Control Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	11,905	11,905	11,905	11,905	11,905	6406	5499	11,905	11,905	11,905	11,905	11,905
pseudo R ² or adj. R ²	0.062	0.081	0.030	0.051	0.138	0.450	0.343	0.139	0.241	0.145	0.181	0.220

*, **, *** represent significance at the level of 0.10, 0.05, and 0.01, respectively. Standard errors are in parenthesis below the regression coefficients. All variables are defined in Table 2.

Consistent with our expectation (Hypothesis 3a), SOEs in litigation are more likely to use real earnings management to substitute for accruals management ($RM_{H_DA_L}$ coefficient = 0.318, p -value < 0.05). With an anticipated increase in scrutiny from regulators and auditors, managers in SOEs that are in litigation tend to use the earnings management strategy that has a lower exposure risk while achieving earnings goals. Moreover, based on the results in Panel B of Table 11, one can notice that central SOEs in litigation are more likely to use the $RM_{H_DA_L}$ strategy (coefficient = 0.362, p value < 0.05) than other companies, supporting our Hypothesis 3b.

Overall, the test results of media attention and litigation show that both have more impacts on the earnings management strategies of SOEs, especially central SOEs, than on that of non-SOEs. Such impact might be related to the higher cost of the reputation loss caused by exposure of earnings management on SOEs than on non-SOEs. The government and regulators should pay close attention to the trade-off issue of earnings management strategies in SOEs with high media attention or litigation.

4.3. Robustness Tests

In this study, we used the modified Jones Model [43] to estimate discretionary accruals. This is based on the findings in prior literature [46,47] that the modified Jones model has a better explanatory power for Chinese enterprises compared to other models. To examine whether our results are robust to other commonly used estimation models for discretionary accruals, we used performance-adjusted discretionary accruals developed by Kothari et al. [45] to conduct our analyses. Our results stay the same.

To examine whether the substitution of real earnings management for accruals management is caused by the state ownership, we used a natural experiment setting and perform a difference-in-difference test on those firms that changed from non-SOEs to SOEs. Our test results show that a firm is more likely to use the strategy of high real earnings management and low accruals management after the firm changed from a non-SOE to a SOE. This result provides further evidence for our hypothesis.

When assessing a firm's use of real and accruals management and earnings management combination strategy, we followed Braam et al. [11] to use the industry-year median as cut-off point to determine the values of the dummy variables: RM_Dummy and AM_Dummy . To examine whether our results are robust to alternative cut-off points, we repeated our analyses by using the top and bottom 25% of the sample. Our untabulated results show that all the results are robust to the change of cut-off points.

Unlike Chan et al. [23], some prior literature does not include AM (or RM) as a control variable in the models for the test on the opposite earnings management strategy RM (or AM). In order to examine whether the omission of AM (or RM) in the models will affect our results, we repeated all our tests by removing the control variable from our regression models. Our results remain the same.

Fan and Song [7] found that central SOEs engage in real earnings management to reduce GDP volatility. In order to examine whether our results are affected by the GDP volatility, we included dummy variables of high and low GDP years in our models and repeated our analyses. We obtained the same results.

Prior literature has often used an earnings management suspect group to examine the trade-off issue of earnings management strategies [20,22,23]. We followed the prior literature and use only those firms that intended to use earnings management to manipulate earnings as the suspect group to examine how these firms choose earnings management strategies. We obtained similar results.

5. Conclusions

In recent years, financial crises, pandemics, and regional conflicts have led to significant uncertainties to business operations. In response, companies are placing greater emphasis on enhancing risk governance processes to ensure the safety and reliability of their supply chains. Selecting stable and reliable partners to work with has become an in-

creasingly crucial question for organizations to answer. Previous research on supply chains has shown that accounting information is often used by firms to evaluate the profitability and operational efficiency of suppliers [3]. However, if such financial information has been manipulated by the providers, it can lead to a misjudgment of the credibility and reliability of suppliers by the users. Using A-share Chinese firms listed on the Shenzhen and Shanghai Stock Exchanges for the years 2003–2018, we performed an in-depth analysis of the impact of state ownership on earnings management strategies, particularly the trade-off issue between the two different types of earnings management: accruals management and real earnings management. We found that: first, in contrast with non-SOEs, SOEs prefer to substitute real earnings management for accruals management, indicating a trade-off between the two strategies. Moreover, when comparing central SOEs to local SOEs, we found that central SOEs are more likely to substitute real earnings management for accruals management. Second, we also performed analyses on the joint effects of media attention and state ownership on a firm's earnings management strategies and found that, when compared to SOEs with low media attention, the SOEs with high media coverage are more likely to use real transactions than accruals to manipulate earnings. In particular, this result is more salient in central SOEs. Third, we tested the joint effects of litigation and state ownership on earnings management strategies and found that SOEs, particularly central SOEs, with an incidence of litigation are more likely to favor real earnings management over accruals management.

Our study makes several important contributions to the earnings management literature in China. We use different methods to examine the trade-off issue of earnings management at the firm level. Furthermore, to our best knowledge, we are the first to examine how the interactions between state ownership and other factors such as media attention and litigation impact managers' selection of earnings management strategies. Compared with prior literature on earnings management studies using Chinese listed firms, our investigation uses a longer and more recent period, from 2003 to 2018, to study the effects of ownership structures on earnings management. In addition, unlike most prior research, we divide SOEs into central SOEs and local SOEs to examine the impact of different types of state ownership on earnings management.

Using a large data set of Chinese listed firms, our results provide additional empirical support to Braam et al.'s [11] argument that firms with strong political connections are more likely to substitute real earnings management for accruals management. By exploring the impact of media attention and litigation on how state ownership affects earnings management strategies, we provide evidence to explain why politically connected firms prefer to use real earnings management to accruals management. It appears that, compared to the management of non-SOEs, the management of SOEs are more concerned with the exposure of earnings management since they risk losing all their privileges when their reputation or public image is damaged. In other words, they have a higher cost of using accruals management since this method is under stricter public scrutiny and subject to more severe penalties from regulators. Furthermore, those factors that affect the exposure risk (e.g., media attention) and the scrutiny level (e.g., litigation) of external reviewers will have a significant impact on earnings management strategies. All these findings suggest that, when selecting suppliers, companies should be attentive to the credibility of the financial information they provide. In addition to accruals management, some firms may use real earnings management, which is more difficult to detect, to manipulate earnings. Such actions will harm the companies in the long term, making them less dependable partners to work with. Regulators should also pay more attention to real earnings management to investigate whether some firms have sacrificed the long-term interests of the company to meet the demands of customers. Furthermore, we suggest firms and regulators to pay close attention to real earnings management in companies with strong political connections, such as central SOEs, and to incorporate more comprehensive measures to assess the performances of these firms and the integrity of their executives.

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