# Employee Stock Ownership Plans: Charity or Conspiracy?

# Evidence from China

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**Abstract:** This study investigates the relationship between controlling shareholder share pledging and non-financial information disclosure, focusing on the management tone in annual reports. Ana-lyzing data from listed Chinese companies from 2007 to 2020, we observe that companies with controlling shareholder share pledging, particularly those with larger pledge scales, tend to adopt a more positive management tone in their annual reports. This effect is more pronounced in non-state enterprises. Moreover, our findings indicate that controlling shareholder share pledging influences the net tone of management in annual reports not only by increasing the disclosure of positive tone, but also by decreasing the disclosure of negative tone. This dual effect suggests that the internal governance and operating conditions of listed companies may have a governing effect after share pledging. Therefore, this study contributes to the existing literature by identifying a novel moti-vation for non-financial information disclosure and expanding upon the economic consequences of controlling shareholder share pledging. Furthermore, by examining non-financial information disclosure through the lens of the second type of principal-agent relationship, this study offers practical insights into why such disclosures can be manipulated and provides valuable references for enhancing regulatory frameworks in emerging countries.

**Key words:** non-financial information disclosure, share pledging, information manipulation, internal govern-ance

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# Management Tone and Share Pledging：Exploring Non-Financial Disclosure Dynamics in Chinese Listed Companies

**Abstract:** This study investigates the relationship between controlling shareholder share pledging and non-financial information disclosure, focusing on the management tone in annual reports. Analyzing data from listed Chinese companies from 2007 to 2020, we observe that companies with controlling shareholder share pledging, particularly those with larger pledge scales, tend to adopt a more positive management tone in their annual reports. This effect is more pronounced in non-state enterprises. Moreover, our findings indicate that controlling shareholder share pledging influences the net tone of management in annual reports not only by increasing the disclosure of positive tone, but also by decreasing the disclosure of negative tone. This dual effect suggests that the internal governance and operating conditions of listed companies may have a governing effect after share pledging. Therefore, this study contributes to the existing literature by identifying a novel motivation for non-financial information disclosure and expanding upon the economic consequences of controlling shareholder share pledging. Furthermore, by examining non-financial information disclosure through the lens of the second type of principal-agent relationship, this study offers practical insights into why such disclosures can be manipulated and provides valuable references for enhancing regulatory frameworks in emerging countries.

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**JEL Classification:** G34, G14, G32

## 1. Introduction

In recent years, with the evolution of new information technologies, artificial intelligence,

and trading strategies, research on non-financial information disclosure based on massive data analysis has become a new direction in the field of finance. Unlike standardized traditional financial data, non-financial information constitutes a larger share of companies' external communications, exhibits more flexible expression forms, and utilizes a broader range of dissemination channels. This type of information encapsulates rich connotations that purely financial data cannot convey, especially in China's unique investor structure and high-context communication environment, where the agency problem of the second type of entrusted agency is more severe for listed companies. Thus, the dominant agency problem in Chinese firms is the conflict between minority shareholders and controlling shareholders, which is usually more severe than that between managers and shareholders. This institutional context not only intensifies the challenges faced by listed companies but also distinctly sets it apart from analyses grounded in developed market environments.

Controlling shareholder share pledging refers to a financing method whereby the controlling shareholder of a company secures funds from a financial institution by using its equity holdings as collateral. Investigating the self-interested behaviors of major shareholders through non-financial information disclosure necessitates specific exogenous events, and share pledging offers an apt experimental scenario for such research. There are two primary reasons for this suitability: First, share pledging is predominantly an activity undertaken by major shareholders. Second, a decline in stock prices can exert liquidation pressure on pledged shares, compelling major shareholders to implement strategies to stabilize stock prices. By manipulating non-financial information disclosure, these shareholders may temporarily elevate stock prices.

The primary advantage of stock pledge is that it enables shareholders to obtain credit financing while retaining the cash flow and voting rights associated with the company's stock (Anderson and Puleo, 2020). Although this strategy allows controlling shareholders to maintain their voting rights, it also carries the risk of losing control over the listed company if a significant proportion of their shares are pledged. Following the 2006 stock split reform, the valuation of

pledged stocks is now market-driven, making the stock price a critical determinant for margin calls related to stock pledges. When stock price fall below a certain threshold, shareholders with pledged stocks receive margin call from the lending institution, requiring them to increase their collateral. Failure to meet these demands allows creditors the right to liquidate the pledged stocks in the market. Such Large-scale selling can trigger a downward spiral in stock prices and diminish market value, potentially leading to a stock price crash and increasing the risk that controlling shareholders might lose their grip on the company. To prevent a transfer of control, controlling shareholders have an incentive to release favorable non-financial information to stabilize the stock price. A significant research question arises: do listed companies with controlling shareholder share pledging and larger pledge scales exhibit a greater propensity to manipulate capital markets through non-financial information disclosure?

Therefore, this study utilizes data from listed companies in China spanning from 2007 to 2020 to investigate the impact and underlying mechanism of controlling shareholder share pledging on the non-financial information disclosures of these companies. Our findings indicate that the management tone in the annual reports of companies with controlling shareholder share pledging, particularly those with larger pledge scales, is more positively expressed. This observation confirms the behavior of beautifying non-financial information disclosures following a share pledge. Notably, this whitewashing effect is more pronounced in non-state enterprises. Furthermore, listed companies with controlling shareholder share pledging influence the net management tone in the annual report not only by increasing the disclosure of positive tone but also by reducing the disclosure of negative tone. This dual approach to managing disclosure tone underscores the complex dynamics at play. Additionally, the internal governance and operational conditions of these companies appear to moderate the extent of the whitewashing behavior post-pledging.

Our decision to focus on China stems from several compelling reasons. First, China continues to open its financial markets, enhancing foreign investor accessibility. This trend was notably marked by the inclusion and subsequent expansion of China A-shares in the MSCI Emerging

Markets Index in 2018, as announced by Morgan Stanley Capital International, a leading publisher of global equity indices. However, investors face significant challenges, including market volatility and poor corporate governance.[1] The Wall Street Journal has highlighted potential hidden risks associated with share-backed loans.[2] Additionally, concerns persist regarding the suspension of stock trading, which can prevent investors from withdrawing their investments.[3] This issue was particularly evident during the 2015 Chinese stock market crash when approximately half of the A-share market suspended trading, largely due to major shareholders' share-backed loans.[4]

Second, share pledging by controlling shareholders to secure loans from financial institutions is prevalent in China. Our sample includes over one-third of firms engaged in share pledging, with a clear upward trend in such transactions. Notably, on May 24, 2013, regulatory bodies including the China Securities Regulatory Commission and the Shanghai Stock Exchange issued the "Measures for Stock Pledge Repurchase Transactions and Registration and Settlement Businesses (Trial)," facilitating securities companies' participation in share pledging activities. Since then, the volume of share pledging transactions by major shareholders has grown substantially. The proportion of controlling shareholder share pledging in Chinese listed companies increased consistently from 2007 to 2016, reaching an average of 15% of total company shares in 2016. According to the CSMAR database, the prevalence of controlling shareholder share pledging has risen annually from 2007 to 2018, with nearly 50% of listed companies exhibiting such behavior in 2017.

Third, the Chinese context allows for an in-depth analysis of how controlling shareholders'

[1] See https://www.ft.com/content/ad7f5aec-599d-11e8-bdb7-f6677d2e1ce8 (Financial Time, "MSCI warns of investors facing challenges over China A-shares" by James Kynge, May 17, 2018)
[2] See https://www.wsj.com/articles/the-sea-of-leverage-in-chinese-markets-1527074940 (Wall Street Journal, "The Sea of Leverage in Chinese Markets" by Jacky Wong, May 23, 2018)
[3] See https://www.ft.com/content/cb84f678-67bc-11e8-8cf3-0c230fa67aec (Financial Times, Chinese stock suspensions a 'visceral' issue for investors by Emma Dunkley, June 5, 2018)
[4] One Deutsche Bank analyst remarked, "Stocks are being suspended by the companies themselves because many have bank loans backed by shares which the banks themselves may want to liquidate, joining the queues of margin sellers", as reported by Bloomberg. (See https://www.bloomberg.com/news/articles/2015-07-08/this-is-why-so-many-chinese-companies-are-suspended, "China's corporations have been big fans of stock-based loans, too" by Tracy Alloway, July 8, 2015)

financial strategies influence non-financial information disclosure. In most Chinese publicly traded firms, controlling shareholders play a crucial role, either by directly managing the firm or by controlling managerial appointments. This is a common phenomenon globally (La Porta et al. [1999]), yet data on the dynamic attributes of controlling shareholders is scarce. The unique data availability in China provides a robust setting to explore this dynamic. The China Securities Regulatory Commission mandates that publicly traded firms disclose major shareholders' pledging transactions (defined as shareholders holding more than 5% of shares). This data enables us to investigate how these private financial arrangements of controlling shareholders impact non-financial information disclosure. Moreover, the detailed disclosure by Chinese firms allows us to estimate the size of the personal debt secured against stock holdings, thereby providing a more nuanced understanding of the margin call risk faced by pledging insiders, as opposed to relying on a simplistic binary indicator of share pledging employed in many studies outside China.

Our study makes several significant contributions to the existing literature. First, it identifies a novel motivation for the disclosure of non-financial information, thereby enriching discussions on what drives non-financial disclosure practices. Second, this research extends the limited body of knowledge on the economic implications of share pledging by controlling shareholders, offering new insights into its broader impacts. Finally, this study addresses the question of "why non-financial information disclosure can be manipulated" from the perspective of the second type of entrusted agency. This perspective provides valuable references for enhancing regulatory frameworks in emerging markets. The findings hold practical significance for improving oversight of listed companies and ensuring more transparent disclosure practices.

The remainder of this study is structured as follows. Section 2 provides a theoretical analysis and research hypotheses. Section 3 describes the research design, detailing the data sources, model settings, and sample selection criteria. Section 4 discusses the main empirical findings. Section 5 conducts robustness tests. Section 6 further examines the mechanisms. Section 7 offers the further analysis. Section 8 concludes the study, emphasizing its policy implications.

## 2. Institutional background and Hypothesis Development

### 2.1. Institutional background: share pledging in Chinese capital market

Share pledging represents a key mechanism by which shareholders of listed companies secure loans from financial institutions. These loans typically serve various purposes, including meeting working capital requirements, financing new ventures or acquisitions, and fulfilling personal financial needs. Compared with other types of collateralized loans, share pledging is particularly attractive to both borrowers and lenders. First, share pledging enables shareholders of listed firms access to significant loans amounts while retaining control rights over the shares, such as attending board meetings, proposing agendas, and voting. Second, shares of listed companies offer higher liquidity compared to other forms of collateral, thus presenting a more appealing option for lenders. Consequently, the practice of share pledging has become increasingly widespread in China's capital market.

Regarding the operational details of share pledging transactions, discussions with industry practitioners reveal the following process: The borrower pledges share to the lender, who then determines a reference price based on current market values and assigns an advance rate to the collateralized shares. Typically, the loan amount granted corresponds to 30% to 50% of the market price per pledged share. Furthermore, when the borrower renews or rolls over their share pledges, the lender may issue a new contract reflecting the updated share price. In China, these lenders are predominantly commercial banks and brokerage houses. An increase in share prices allows the controlling shareholder to either increase the loan amount by rolling over the pledge or reduce the number of shares pledged. During the pledging period, the borrower must maintain a specified margin level, ensuring that the value of the pledged shares remains at least a certain percentage above the loan principal. ensuring that the value of the pledged shares remains at least a certain percentage above the loan principal. This margin requirement, distinct from the advance rate, typically ranges from 130% to 160% of the loan value. In the event of a significant price decline triggering a margin call, the pledgor must either reduce the debt or provide additional shares as

collateral. Failure to meet the margin call allows the lender to liquidate the pledged shares, potentially resulting in the controlling shareholder losing control of the firm.

The China Securities Regulatory Commission (CSRC), the nation's securities regulator, mandates that firms disclose any share pledging transactions by major shareholders—defined as those holding more than 5% of shares outstanding. The disclosure framework, which goes beyond merely indicating the pledging status of insider holdings at the end of a reporting period, enables a more precise estimation of the personal debt secured against stock holdings and the associated margin call risk of pledging insiders.

### 2.2. Hypothesis development

In Chinese listed companies, the high concentration of equity often leads controlling shareholders and management to utilize non-financial information disclosure as a tool for advancing their own interests. According to the second type of agency theory framework, controlling shareholders who have pledged their shares are likely to influence management to elevate the company's stock price. This strategy aims to mitigate their risk of facing margin calls, albeit at the expense of the interests of minor and external shareholders, thereby constituting an act of expropriation. To align the interests of management with those of controlling shareholders, the latter may opt to decrease the link between executive compensation and company performance. Moreover, although the action of share pledging by controlling shareholders is personal and ostensibly should not impact the listed company's balance sheet or or its overall operations significantly, it can, in fact, skew the behavior of these shareholders. Ouyang et al. (2019) argued that the presence of equity-pledged companies correlates with higher levels of perks consumption by management, indicating potential collusion between controlling shareholders and management. While such share pledging does not alter the formal equity structure of the listed company or the ownership and control rights of the controlling shareholders, it does lead to a further divergence between cash flow rights and control rights within Chinese listed companies. Lee and Yeh (2004)

argued that the share pledging activities of controlling shareholders modify the behavior of these internal shareholders, thereby intensifying the agency conflict between controlling shareholders and minor shareholders.

The existing literature, including Chan et al. (2018), identifies share repurchases as a market-value management tool that helps listed companies and their controlling shareholders mitigate the risk of losing control. This research also highlights the effectiveness of tactics such as earnings management and withholding negative news. When controlling shareholders pledge shares for speculative and self-serving reasons, this often results in sacrificing the interests of other shareholders, exemplifying a classic second-type agency problem. According to Liu and Tian (2022), in such scenarios, controlling shareholders are motived to manipulate positive news to sustain the company's stock price, preventing the liquidation of pledged stocks, and thus diminishing the risk of control transfer. Chinese regulations stipulate that if shareholders cannot repay their loans upon maturity, the creditor is entitled to sell the pledged equity on the capital market to enforce repayment. If the proceeds from the sale of the pledged shares are insufficient to cover the loan, the borrower must settle the remaining balance through alternative means. This context leads controlling shareholders, after pledging their shares, to face significant risk of personal wealth loss and control transfer, providing them with ample incentive to engage in non-financial information disclosure for market-value management.

Moreover, the discourse on corporate information disclosure has predominantly focused on financial information manipulation or strategic disclosure. Research indicates that management is more likely to disclose positive information during insider trading periods, and to delay or cluster negative information disclosure post-insider trading or during times of reduced investor attention, such as Fridays (known as the "Friday effect"). This strategy aims to soften the negative impact on insider interests or the company's stock price. Given the rigorous regulation and close monitoring of financial disclosures, the impetus for strategic financial disclosure by management is relatively weak. However, the disclosure of non-financial information, characterized by its unpredictability

and susceptibility to manipulation, presents greater challenges for verification. In environments where controlling shareholders have pledged their equity, there is a heightened incentive and capability for management to manipulate non-financial information. This leads to our first hypothesis:

**H1:** Companies with controlling shareholders who have pledged their shares are more likely to present a positive tone in management discussions and analysis (MD&A) text within their annual reports compared to companies without such share pledging.

The extent of controlling shareholders' share pledging significantly influences the tone of management discussion and analysis (MD&A) text in the non-financial information of annual reports of companies listed on China's A-share market. As the volume of shares pledged by the controlling shareholders increases, their liquidity risk escalates concurrently. This situation limits their capacity for further share pledges and accentuates the impact of any stock price declines on these shareholders. Consequently, shareholders with a substantial amount of pledged shares are more incentivized to manipulate disclosures in non-financial information as a strategy for managing market value. Based on this understanding, the study introduces the following hypothesis:

**H2:** The greater the scale of controlling shareholders' share pledging, the more positive the tone of the MD&A text in the non-financial information of listed companies' annual reports.

# 3. Methodology

### 3.1 Data source

This study examines the impact of controlling shareholder share pledging behavior on the tone of management in companies listed on the Shanghai and Shenzhen stock exchanges. The analysis covers the period from 2007 to 2020. To enhance the validity of the study, companies within in the financial and real estate industries were excluded due to their unique capital structures and market dynamics. Additionally, companies classified under special treatment (ST), particular

transfer (PT), and those with missing data were omitted from the sample. The final sample comprises 4201 companies, yielding 36,610 company-year observations. To mitigate the influence of outliers, a Winsorization of 1% to 99% was applied to all continuous variables.

Data were sourced from multiple databases. The China National Research Data Service Platform (CNRDS) provided data regarding the frequency of positive and negative tone words in the Management Discussion and Analysis sections of annual reports. Information on controlling shareholders' share pledging was obtained from the Wind database. The CSMAR database supplied additional data for index calculation and financial metrics.

### 3.2 Variables Measurement

*1. Calculation of management tone*

This study employs the Jieba word segmentation method to analyze the frequency of positive and negative tone words in the annual report text of each listed company annually. The tone of management discussions and analyses is then quantified using the following formula.

$$Tone = (Tone\_P - Tone\_N) / (Tone\_P + Tone\_N) \quad (1)$$

Where *Tone_P* represents the proportion of positive tone words within the management discussion and analysis section of a company's annual report, relative to the total count of both positive and negative tone words. *Tone_N* represents the proportion of negative tone words within the same section, also relative to the total count of positive and negative tone words.

*2. Earnings management through accruals*

This study employs the revised Jones model to estimate the discretionary component of a company's accruals, thereby quantifying the extent of accrual-based earnings management. The regression model utilized is presented as follows:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (2)$$

Where $TA_{i,t}$ represents the total accruals for firm $i$ in year t, calculated as $NI_{i.t}$ –$CFO_{i.t}$, where $NI_{i.t}$ is the net income and $CFO_{i,t}$ represents the cash flow from operations for the year. $\Delta REV_{i,t}$ and $\Delta REV_{i,t}$ capture the changes in operating revenue and net accounts receivable, respectively, from year t-1 to year t. $PPE_{i,t}$ represents the net value of property, plant, and equipment in year t, and $A_{i,t-1}$ is the total assets at the end of year t-1. Moreover, each fiscal year, model (2) is estimated separately. The residual from this model, denoted as $DA_{i,t}$. represents the discretionary accruals of the firm. A higher value of *DA* suggests a greater degree of earnings management through accrual manipulation to potentially enhance reported profits.

*3. Real earnings management*

Drawing on the framework established by Roychowdhury (2006), this study identifies three primary approaches of real earnings management: sales manipulation, production manipulation, and expense manipulation.

**Sales manipulation.** This technique involves artificially boosting sales revenue to augment reported earnings within a specific period. This can be achieved through aggressive discounting or relaxed credit terms. However, such practices typically do not correspond to an equivalent increase in operating cash flow, indicating potential earnings manipulation. The associated model is formulated as follows:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{REV_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \qquad (3)$$

Where $CFO_{i,t}$ represents the net operating cash flow for company $i$ in year t, $REV_t$ and $\Delta REV_t$ represent the total operating revenue in year t and t the year-over-year change in operating revenue, respectively. The residual from this regression, specific to industry and year, captures the abnormal operating cash flow attributable to sales manipulation, denoted as $EM\_CFO_t$.

**Production manipulation.** This approach involves a strategy employed by certain companies to reduce per-unit fixed costs by ramping up production volumes. This strategy decreases the

reported cost of sales and artificially inflates current earnings, despite potentially leading to higher overall production costs than initially planned. This computation involves adjusting for changes in inventory levels at the beginning and end of the period, combined with the costs of goods sold, as outlined in the formula below:

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\frac{1}{A_{i,t-1}} + \alpha_2\frac{REV_{i,t}}{A_{i,t-1}} + \alpha_3\frac{\Delta REV_{i,t}}{A_{i,t-1}} + \alpha_3\frac{\Delta REV_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (4)$$

Where $PROD_{i,t}$ represents the production cost for company $i$ in year t, $\Delta REV_{i,t}$and $\Delta REV_{i,t-1}$ reflect the change in revenue between years t and t-1, and t-1 and t-2, respectively. The residual from this regression, tailored to specific industries and years, captures the abnormal costs linked to production manipulation, denoted as $EM\_PROD_{i,t}$.

**Cost manipulation.** This term refers to the discretionary manipulation of costs where enterprises strategically reduce expenditures that do not immediately impact revenue. Such expenditures typically include research and development (R&D) and employee training costs—to artificially inflate current earnings. The objective behind this manipulation is to artificially inflate current earnings. By employing specific analytical models, it is possible to identify abnormal cost expenses associated with these practices:

$$\frac{DISEXP_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\frac{1}{A_{i,t-1}} + \alpha_2\frac{REV_{i,t-1}}{A_{i,t-1}} + + \varepsilon_{i,t} \quad (5)$$

Where $DISEXP_{i,t}$ represents the total discretionary costs of the enterprise in year t, $REV_{i,t-1t-1}$ represents the revenue in year t-1. The residual term from the industry-year regression in equation (5) captures the abnormal operating cash flow associated with sales manipulation, denoted as $EM\_DISEXP_{i,t}$.

Furthermore, this study constructs a proxy indicator for real earnings management, $REM_{i,t}$. by combining various calculation methods. A higher $REM_{i,t}$ value indicates a greater likelihood of companies engaging in real earnings management to boost their profits:

$$REM_{i,t} = EM_{PROD_{i,t}} - EM_{CFO_{i,t}} - EM_{DISEXP_{i,t}} \quad (6)$$

**Other control variables.** To comprehensively account for additional factors that may influence management tone, this study incorporates several control variables. These include firm size (Size), firm age (Age), state ownership (SOE), and analyst coverage (Coverage), among others. A detailed description of the variables is provided in Appendix A1.

### 3.3 Empirical Model

To examine the impact of controlling shareholders' share pledging behavior on the management tone in annual reports of listed companies, this study proposes the following empirical model to test the hypothesis:

$$Tone_{i,t} = \alpha + \beta Pledge_{i,t} + \gamma Control_{i,t-1} + year + industry + \varepsilon_{i,t} \quad (7)$$

Where $\boldsymbol{Tone_{i,t}}$ represents the management tone in the annual report of company $\boldsymbol{i}$ in year t, $\boldsymbol{Pledge_{i,t}}$ measures the scale of share pledging by the controlling shareholder of company *i* in year *t*. The term "industry" accounts for the industry-specific fixed effects, while "year" captures the time-specific fixed effects. The error term is represented by $\boldsymbol{\varepsilon_{i,t}}$. To account for individual clustering, this study employs robust standard errors. Additionally, $\boldsymbol{Control_{i,t-1}}$ includes a set of control variables that potentially influence the management tone in annual reports. These control variables are intentionally lagged by one period to mitigate endogeneity concerns that might arise from reverse causality.

## 4. Empirical results

### 4.1 Descriptive statistics

Table 1 presents the descriptive statistics for the main variables in this study. The s dataset comprises annual data for 36,610 companies. The results reveal the tone of management discourse in annual reports of Chinese listed companies: i) the average (mean) tone is 0.408, with a median of

0.413, ranging from a minimum of 0.028 to a maximum of 0.754. ii) The positive tone of management discourse (Tone_P) has a mean of 0.704 and a median of 0.706, with values stretching from 0.514 to 0.877. iii) The negative tone of management discourse (Tone_N) shows a mean of 0.296 and a median of 0.294, with a minimum of 0.123 and a maximum of 0.486. The analysis indicates that the number of positive tone words significantly exceeds the number of negative tone words in the annual reports of Chinese listed companies, suggesting a predominantly positive tone overall.

Additionally, observations with controlling shareholder share pledging at year-end constitute 46.2% of the sample, highlighting that share pledging is a prevalent practice among controlling shareholders of listed companies. The average pledge size, considering the entire sample, reveals that pledged sharesby controlling shareholders represent 7.9% of the total outstanding shares of these companies, underscoring a relatively high level of share pledging. The complexity of the annual report text has a mean of 8.996 and a median of 9.051, with values ranging from 6.690 to 10.610. The mean return on equity (ROE) for these companies stands at 0.065, indicating that the overall ROE for Chinese listed companies is not particularly high. The statistical results for other significant variables align closely with findings reported in most existing literature.

*** Table 1 is inserted here ***

According to the test results presented in Table 2, the mean tone of the management team in the companies with pledged equity by controlling shareholders (Pledge=1) is 0.412, which is significantly higher compared to the mean tone in companies without such pledged equity (Pledge=0). This difference is statistically significant at the 1% level. Moreover, the analysis reveals distinct contrasts in the nature of management tone between the two groups: i) the positive management tone in companies with pledged equity (Pledge=1) is significantly higher than in those without pledged equity (Pledge=0). Conversely, the negative management tone in companies with pledged equity (Pledge=1) is significantly lower than in those without pledged equity (Pledge=0),

wtih this difference also achieving statistical significance at the 1% level. These findings suggest that the management tone in listed companies with pledged equity by controlling shareholders is generally more positive. Additionally, when considering other control variables, significant differences at the 1% level are observed between companies with and without pledged equity by controlling shareholders.

*** Table 2 is inserted here ***

**4.2 The impact of share pledging of controlling shareholders on the management tone in annual reports**

The regression results from column (1) of Table 3 clearly indicate that the dummy variable for controlling shareholder share pledging (Pledge) has a significantly positive impact on the management tone in annual report, with a coefficient of 0.0018 (T=3.25). This finding suggests that companies with share pledging by controlling shareholder typically exhibit a more positive management tone compared to those without, with statistical significance at the 1% level. Even after controlling for other influencing factors, as shown in column (2), the positive impact of the Pledge variable on management tone remains significant, and the sample regression $R^2$ increases notably from 0.195 to 0.259. These results lend robust support to H1.

Further analysis, as detailed in column (3) of Table 4, reveals that the share pledging ratio of controlling shareholders *(Pledge_Ratio)* also significantly influences the management tone, with a coefficient of 0.0096 (T=2.97). This implies that a higher share pledging ratio correlates with a more positive management tone. The findings in column (4) corroborate this relationship even after adjusting for other variables, with a coefficient of 0.0087 (T=2.01), thus affirming H2.

Additionally, The leverage ratio (LEV) of companies negatively correlates with management tone, significant at the 1% level, implying that higher leverage is associated with a more negative tone. Conversely, the return on equity (ROE) shows a positive relationship with management tone,

suggesting that companies with higher ROE generally exhibit a more positive tone. The duality of the chairman and CEO roles (DUAL) positively influences the tone, reflecting the impact of consolidated leadership. Larger companies, as indicated by the positive coefficient for company size (Size), tend to have a more positive management tone. The sales growth rate (SGR) has a significantly positive coefficient at a 1% confidence level, suggesting that companies experiencing higher growth phases are likely to present a more positive management tone. Finally, the positive coefficient associated with state-owned enterprises (SOE) implies that these entities typically maintain a more positive tone in their reports compared to non-state-owned firms.

*** Table 3 is inserted here ***

### 4.3 Heterogeneity analysis

#### *4.3.1 Effect of state ownership*

A primary challenge for China's state-controlled listed companies is the classic agency problem. The management of these companies, lacking ultimate ownership stakes, strives to maintain stock price and mitigate the risk of price collapse by managing the tone of language in the annual report. However, their incentives for such management practices are generally weak. Typically, managers of SOEs are appointed directly by government agencies. Even if share pledging by a controlling shareholder result a transfer of control, these managers may continue their careers within government departments or other state enterprises. Conversely, managers at non-state-owned companies face greater personal risk. If share pledging by a controlling shareholder forces a position closure, leading to a control transfer, these managers could lose their jobs, substantially affecting their professional reputation. Consequently, non-state-owned companies exhibit a stronger motivation to cultivate a positive tone in management's discourse within annual reports to bolster stock prices and diminish the risk of losing control. This study categorizes listed companies into state-owned and non-state-owned based on the nature of equity ownership. It further investigates the relationship between the pledging of shares by controlling shareholders and the impact of the

magnitude of such pledging on the tone of management in the annual reports of these two distinct categories. The results of this analysis are presented in Table 4.

Based on the regression analyses presented in Table 4, columns (1) and (2), a discernible pattern emerges among non-state-owned controlling sample companies. The regression coefficients for the share pledging dummy variable (*Pledge*) are significantly positive, demonstrating a substantive and positive correlation between share pledging by controlling shareholders and the management tone in the annual reports of these companies. Conversely, the positive correlation between controlling shareholder share pledging and management tone does not reach statistical significance in state-owned controlling listed companies. Further examination of the scale of share pledging by controlling shareholders (*Pledge_Ratio*) reveals that its significant positive effect on management tone is confined to non-state-owned controlling companies. This finding underscores a tendency for non-state-owned enterprises to adopt a more positive tone in their annual reports following share pledging by controlling shareholders, in contrast to their state-owned counterparts. In summary, the evidence suggests that non-state-owned enterprises are more likely to exhibit a positive management tone in their annual reports after controlling shareholder share pledging, compared to state-owned controlling sample companies.

*** Table 4 is inserted here ***

***4.3.2*** *Effect of insider ranks of controlling shareholders*

In contrast to firms in the U.S. and some Western countries, Chinese listed firms typically exhibit a concentrated ownership structure, with the majority being controlled by their largest shareholders. It is common for controlling shareholders to hold positions such as chairperson and/or chief executive officer (CEO). Within the Chinese capital market, chairpersons generally wield more authority than CEOs, and in certain instances, they also serve concurrently as CEOs (Jiang & Kim, 2015). Considering both information risks and agency conflicts, it is hypothesized that the manipulation of corporate disclosure and the resultant agency conflicts from share pledging are

contingent upon the extent of control rights possessed by controlling shareholders. Specifically, the greater the control rights of these shareholders, the more pronounced is their motivation to manipulate corporate disclosure, attributed to the high costs associated with potential loss of control. Conversely, substantial control rights may exacerbate agency conflicts due to significant discrepancies between ownership and control arising from share pledging. To analyze this, we introduce an indicator variable, *DUAL,* which is set to 1 if the controlling shareholder occupies both the chairperson and CEO roles, and 0 otherwise. Subsequent group regressions are conducted to explore these dynamics. The results are presented in Table 5.

*** Table 5 is inserted here ***

Columns (1) to (4) of Table 5 show that firms in which the roles of chairman and CEO are combined (DUAL) and involve share pledging exhibit a significantly higher management tone than their *non-DUAL* counterparts with share pledging. Overall, these findings are consistent with the hypothesis that share pledging has a stronger effect on management tone in *DUALs* than in *non-DUALs*.

***4.3.3** Effect of regional institution environment*

Due to variations in resource endowments and national policies, significant disparities in economic development levels and market institutional environments exist among the eastern, central, and western regions in China (Wang, Fan, & Yu, 2016). A robust institutional environment, which typically offers enhanced investor protection (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998), might influence corporate behaviors, including the management tone in annual reports. We hypothesize that the positive relationship between share pledging by controlling shareholders and the management tone is stronger in in regions with weaker institutional environments (central and western regions) compared to those with stronger institutional environment (eastern region). To test this hypothesis, we conducted a grouped analysis based on the geographical location of the

headquarters of the listed companies, distinguishing between the eastern region and the central and western regions. We defined an indicator variable, *Area*, which is set to 1 for firms located in the eastern region, and 0 otherwise. The regression results are shown in Table 6.

*** Table 6 is inserted here ***

Columns (1) to (4) in Table 6 show that firms located in the central and western regions, which engage in share pledging, exhibit a significantly higher management tone compared to firms in the eastern region that also engage in share pledging. Overall, these results are consistent with the hypothesis that share pledging exerts a stronger influence on management tone in regions characterized by weaker institutional environments than in those with stronger institutional frameworks.

# 5. Robustness checks

## 5.1 The endogeneity problem

### *5.1.1 Instrumental Variables Method*

Considering the possible bidirectional causality between the pledging behavior of controlling shareholders and the disclosure of management tone, along with the possible omission of key variables that simultaneously both controlling shareholder pledge and management tone disclosure, we recognize that endogeneity could lead to biased estimates in our regression analysis. To mitigate this, we employ the mean variables of pledge behavior (*Pledge_hy*) and pledge ratio (*Pledge_Ratio_hy*) of other listed companies in the same industry as instrumental variables in a two-stage least squares (2SLS) regression, as shown in Table 7. We posit that the pledging behaviour of other companies in the same industry influences the pledging action of a given company through a demonstration effect, without directly affecting the management tone in annual reports. This approach satisfies the relevance and exclusivity criteria required for an instrumental variable, thus serving as a robust instrument.

Columns (1) and (3) of Table 7 indicate that in the first stage of the two-stage regression analysis, the industry-average pledge behavior (*Pledge_hy*) and pledge ratio (*Pledge_Ratio_hy*) are positively correlated with the dummy variable for controlling shareholder pledge (*Pledge_d*) and the controlling shareholder pledge ratio (*Pledge_Ratio*) at the 1% significance level. This positive correlation validates the chosen instrumental variables against endogeneity concerns. Columns (2) and (4) show that, when controlling for endogenous via the 2SLS approach, companies with controlling shareholder pledge and higher pledge ratios consistently exhibit a more positive management tone in their annual reports compared to those without such pledge.

Furthermore, robustness of the instrumental variables is confirmed through identification and relevance tests presented in Table 7. The Anderson canonical LM statistic decisively rejects the null hypothesis of weak instrument identification at the 1% level, and the Cragg-Donald Wald F statistic similarly rejects the null hypothesis of weak correlation between instrumental variables and controlling shareholder pledge behavior, indicating a strong correlation between the instrumental variables and endogenous variables. Overall, our conclusion remains robust after accounting for potential endogenous issues.

** *Table 7 is inserted here* **

*5.1.2 Propensity score matching (PSM)*

Financing constraints can affect the share pledging behavior of controlling shareholders, indicating that such behavior is not randomly distributed across companies. To account for the differences in sample characteristics between companies with controlling shareholder share pledging (the experimental group) and those without (the control group), this section employs the Propensity Score Matching (PSM) method to conduct a robustness check and re-estimate the impact of controlling shareholder share pledging on management tone in annual report. The regression results from the matched sample are shown in Table 8.

Columns (1) and (2) of Table 8 reveal that, after controlling for factors affecting the share

pledging behavior of controlling shareholders using the PSM method, a consistent conclusion emerges: companies with controlling shareholder share pledging consistently exhibit a more positive management tone in their annual reports compared to those without, significant at the 1% level. This reinforces the robustness of the main findings of this study. Furthermore, as indicated by the regression results in columns (3) and (4), after adjusting for these factors via the PSM method, the regression coefficient for the scale of controlling shareholder share pledging (*Pledge_Ratio*) is significantly positive. This suggests that a higher share pledging ratio by controlling shareholders is associated with a more positive management tone in the annual reports of listed companies, aligning with the benchmark regression findings.

*** Table 8 is inserted here ***

*5.1.3 Difference-in-differences model (DID)*

The decision to pledging share is a strategic choice made by controlling shareholders, rather than a random occurrence. To address these potential endogeneity concerns, we leverage a regulatory change in 2013 as a quasi-natural experiment to implement a difference-in-differences (DID) model.

The Shanghai Stock Exchange together with the China Securities Depository and Clearing Corporation Limited issued the "Guidance on Stock Pledge Repurchase Transactions, Registration and Settlement" (hereafter referred to as "The Guidance") on May 24, 2013. The primary objective of "The Guidance" was to improve the efficiency of the registration and settlement process for share pledging transactions and reduce the associated cost. The issuance of "The Guidance" provides an exogenous positive shock to share pledging activity, which is unlikely to directly affect a firm's non-financial information disclosure. The regulatory change introduces exogenous cross-firm variation in share pledging practices. We argue that non-SOEs are more responsive to the issuance of "The Guidance" than SOEs for two primary reasons. First, "The Notice on the Relevant Issues Regarding State- owned Shares Pledging" issued by the Ministry of Finance of the People's

Republic of China imposes strict regulations on share pledging by SOEs' controlling shareholders (authorised agents). For example, authorised agents cannot pledge more than 50% of the total state-owned shares in the listed firm and are required to conduct sufficient feasibility analysis, clarify fund usage, and develop repayment plans. Second, due to the external financing facilities (Li, Meng, Wang, & Zhou, 2008) and the government's implicit guarantee (Chen, Chen, Lobo, & Wang, 2011), controlling shareholders in SOEs are less inclined to secure loans through pledging shares compared to their counterparts in non-SOEs. Given the asymmetric shock of "The Guidance" on share pledging between non-SOEs and SOEs, we designate non-SOEs as the treatment group and SOEs as the control group, and construct the following difference-in-differences model.

$$Tone_{i,t} = \alpha_0 + \alpha_1 Treat_{i,t} + \alpha_2 Post_{i,t} + \alpha_3 Treat_{i,t} * Post_{i,t} + \sum a_2 Control_{i,t-1} + id_i + year_t + \varepsilon_{i,t}$$

where Treat is assigned a value of 1 for non-SOEs (treatment group) and 0 for SOEs (control group); Post is set to 1 for the years following 2013 and 0 otherwise; Tone is the outcome variable; and Controls denotes the control variables, consistent with those defined in the baseline model. The parameter of interest is α3 (treatment effect), captures differential changes in Tone before and after the regulatory change between non-SOEs (treatment group) and SOEs (control group). Given the larger positive shock to share pledging in the non-SOEs, we expect α3 to be significantly positive.

*** Table 9 is inserted here ***

The results in Table 9 show that the treatment effect, α3, is significantly positive at the 1% level, aligning with our expectations.

**5.2 Replacing key variable**

Following the methodology used by Huang et al. (2014), we re-examine the main regression results by employing the optimism degree of abnormal textual information in annual reports

(*Tone_a*) as the dependent variable. Table 10 presents the results subsequent to this alteration in the dependent variable, illustrating that both the dummy variable for controlling shareholder share pledging (Pledge) and the scale of controlling shareholder share pledging (*Pledge_Ratio*) exert a significant positive impact on the optimism degree of abnormal textual information. This implies, ceteris paribus, that firms with controlling shareholder share pledging—and particularly those where such pledging is extensive—are more likely to portray optimistic textual information in their annual reports. Therefore, despite the alteration in the measurement of the dependent variable, the main research conclusion of this study remains robust.

*** Table 10 is inserted here ***

Subsequently, robustness tests were conducted by modifying the measure of share pledging behavior. Columns (1) and (2) of Table 11 replaced the independent variable with the number of major shareholders with share pledging (*Pledge_gds*), whereas columns (3) and (4) replaced it with the ratio of pledged shares of controlling shareholders to their total shares in the listed company (*Pledge_Ratio2*).

As shown in columns (1) and (2) of Table 11, the coefficients of the core independent variable (Pledge_gds) are significant and positive. This suggests that a greater number of major shareholders with pledged shares is associated with a more positive and optimistic tone in the management's discussion within annual report. The rationale is that an increased number of major shareholders pledging shares intensifies the incentive for the company to manipulate the information presented in the annual report. According to columns (3) and (4), the coefficient for Pledge_Ratio2 is also positive, reinforcing the finding that a larger scale of share pledging by the controlling shareholder correlates with a more optimistic tone in the management discussion and analysis (MD&A) section of the annual report. In conclusion, these findings affirm that, all else being equal, the greater the scale of share pledging by controlling shareholders, the more likely a listed company is to maintain a positive and optimistic tone in its MD&A section. The robustness and consistency of these

conclusions are well-supported by the empirical evidence.

*** Table 11 is inserted here ***

# 6 Mechanism test

Previously, we argued that share pledging heightens agency conflicts and information risks, which in turn influence non-financial information disclosure. We now explore whether share pledging affects non-financial information disclosure via these two mechanisms.

## 6.1 Agency conflicts

We divide the total sample into two regression samples based on the ratio of shares held by the second to fifth largest shareholders to to those held by the largest shareholder, indicative of either strong or weak equity balance. These subsets were further divided based on the proportion of controlling shareholder share pledging and the listed companies' profit growth rates—high or low—for analysis. The regression results are shown in Table 12.

*** Table 12 is inserted here ***

Columns (1) and (2) of Table 12 reveal that the pledge ratio variable (Pledge_Ratio) is statistically insignificant in companies with strong internal equity balance and yields smaller coefficients compared to those with weaker equity balance. This implies that a significant revelation of a more optimistic management tone in annual reports is only evident in listed companies with controlling shareholder share pledging when there is a weak internal equity balance among major shareholders. Columns (3) and (4) demonstrate that the *Pledge_Ratio* is significant only in samples with a higher proportion of controlling shareholder share pledging, with coefficients greater than in samples with a lower proportion. This suggests that companies with a higher proportion of controlling shareholder share pledging are more likely to increase the frequency of positive tone words in their annual reports, enhancing external investors' estimation of the company's future performance and reducing stock price collapse risks. Lastly, columns (5) and (6) show that the

*Pledge_Ratio* is significant only in samples of listed companies with low profit growth rates, and the coefficients are greater than those for companies with high profit growth rates. This indicates that companies with controlling shareholder share pledging do not need to embellish the management tone in their annual reports when the profit growth is robust. It underscores the role of corporate governance and controlling shareholder incentives in regulating information manipulation following share pledging.

**6.2 Information risks**

Increases in the management tone induced by share pledging may stem from a deterioration in the corporate disclosure quality, resulting in heightened information risks for outside investors. To shed light on this mechanism, we investigate whether share pledging affects corporate disclosure quality via information risks.

First, we employ analyst coverage measure as a proxy for general corporate disclosure quality, denoted as *analyst*. We measure the intensity of analyst activity by the number of analysts who issued earnings forecasts for a firm during a given calendar year. If an analyst issues more than one forecast in a calendar year, only the latest one is retained. For firms without any earnings forecasts, the value for analyst coverage is set to 0. Second, Schnatterly et al. (2008) found that through face-to-face communication between fund companies and listed companies, more business information can be obtained, enabling more accurate predictions about the future operating performance of these companies. Institutional investors' site visits to listed companies can significantly reduce violations such as false disclosure of business information, fictitious profits, and even manipulation of stock prices (Cheng et al., 2019). This reduction is mainly attributable to the fact that site visits and face-to-face interactions provide investors with more genuine business information about the company, thus increasing the likelihood of exposing fraudulent activities and decreasing the probability of violations (Bushee et al., 2011). As institutional investors convey more authentic and accurate information about the characteristics of listed companies to the market, the information content of

stock prices is enhanced through trading (Chen et al., 2007). We use investor site visits as an additional proxy for corporate disclosure quality, denoted by *VIST*. Table 13 reports the results of how share pledging affects these analyst-based measures of corporate disclosure quality.

*** Table 13 is inserted here ***

The results in Columns (1) and (2) show that the coefficient of the pledge ratio variable (Pledge_Ratio) is significant only in the sample of listed companies without analyst coverage, and the coefficient is greater than that in the sample with analyst coverage. The results in Columns (3) and (4) indicate that the coefficient of the pledge ratio variable (Pledge_Ratio) is significant only in the sample of listed companies without investor site visits, and the coefficient is greater than that in the sample with investor site visits. Overall, our findings suggest that share pledging motivates controlling shareholders to defend stock prices by manipulating corporate disclosure, supporting the information risks mechanism.

## 7. Further analysis

The earlier section of this paper has analyzed the significant impact of controlling shareholder share pledging behavior and scale on the net tone of management in annual reports for listed companies. Management tone can be further categorized as positive or negative tone. Thus, a crucial question is what kind of tone (i.e. positive or negative tone) the listed companies with controlling shareholder share pledging use to affect the net tone of management in annual reports. To answer this question, this section will perform regression analysis by dividing the management tone in annual reports into positive tone (*Tone_P*) and negative tone (*Tone_N*), as presented in Tables 14 and 15.

The results presented in Table 14 indicate that the dummy variable for controlling shareholder share pledging (Pledge) significantly and positively influences the positive tone of management (*Tone_P*) in the annual reports of listed companies. With a coefficient is 0.0009 and T-value of 2.25, this effect is statistically significant at the 5% level, suggesting that companies with controlling

shareholder share pledging are more inclined to exhibit a positive management tone in their annual reports compared to those without such pledging. Furthermore, the regression results in column (2) show that, even after controlling for other factors influencing the positive tone of management, the Pledge dummy variable still exerts a significant positive effect on the positive tone of management in annual reports. Moreover, the R-squared of the sample regression has increased notably from 0.195 to 0.259. Additionally, the regression coefficient of the scale of controlling shareholder share pledging (*Pledge_Ratio*) on the positive tone of management in annual reports is significantly positive, at 0.0048 (T=2.79), when controlling for firm-specific and year-specific dummy variables, as shown in column (3) of Table 14. After further adjustments for other factors affecting the positive tone of management, the regression coefficient of the *Pledge_Ratio* on the positive tone of management (*Tone_P*) in the annual reports of listed companies remains significantly positive, at 0.0043 (T=2.01). Thus, these findings indicate that listed companies with controlling shareholder share pledging significantly influence the net tone of management in annual reports by increasing the disclosure of positive management tone.

*** Table 14 is inserted here ***

In addition, the results presented in Table 15 indicate that the dummy variable for controlling shareholder share pledging (*Pledge*) exerts a significant negative effect on the negative tone of management (*Tone_N*) in annual reports of listed companies, evidenced by a coefficient of -0.0009 and a T-value of 2.25. This implies that companies with such pledging are more likely to minimize the disclosure of negative management tone compared to those without, achieving statistical significance at the 5% level. Moreover, additional analyses further substantiate the robustness of these findings. The regression results displayed in column (2) illustrate that, even after adjusting for potential factors that may affect the negative tone of management in a company's annual report, the dummy variable for controlling shareholder share pledging (*Pledge*) still exhibits a significant negative influence on the negative tone of management. The *Pledge* variable maintains a significant negative impact. Furthermore, the results presented in column (3) indicate that, **even** when

controlling for firm-specific and year-specific variables, the regression coefficient associated with the scale of controlling shareholder share pledging (*Pledge_Ratio*) consistently remains significantly negative. These adjustments, accounting for additional factors influencing the negative tone of management, reinforce the persistent negative influence exerted by the *Pledge_Ratio*. Therefore, these results suggest that listed companies with controlling shareholder share pledging not only reduce negative management tone in their annual reports but also possibly engage in information manipulation. This empirical evidence supports our Hypotheses 1 and 2, proposing that listed companies with controlling shareholder share pledging have stronger incentives to manipulate information disclosures.

*** Table 15 is inserted here ***

## 8. Conclusion and discussion

This study analyzes non-financial information disclosure data—specifically, management tone—from 2007 to 2020, alongside controlling shareholder share pledging data, to examine the impact of shareholder share pledging on the management tone in annual reports of listed companies, incorporating a heterogeneity analysis from the perspective of equity nature. The findings reveal that companies with controlling shareholder share pledging, particularly those with larger pledging scales, tend to exhibit a more positive management tone in their annual reports. This tendency confirms the beautification of non-financial information disclosure following controlling shareholder share pledging, with a more pronounced effect observed in non-state enterprises. Moreover, this study identifies that controlling shareholder share pledging can influence the net tone of management in annual reports by increasing the disclosure and reducing negative ones. Additionally, internal governance and operating conditions may moderate the extent of information manipulation following share pledging.

The contributions of this research are threefold: First, it uncovers a new motive for non-financial information disclosure, thereby enriching the existing literature on disclosure motives.

Second, it expands the literature on the economic consequences of controlling shareholder share pledging through an analysis of its impact of on the management tone in company reports. Third, this study elucidates why non-financial information disclosure can be manipulated, framing the discussion within the context of Type II agency problem. These insights provide valuable reference for enhancing regulatory systems in emerging markets and offer significant practical implications.

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**Table 1.** Descriptive statistical analysis of main variables

| Variable | Observation | Mean | Standard Deviation | Minimum | Median | Maximum |
|---|---|---|---|---|---|---|
| *Tone* | 36,610 | 0.408 | 0.143 | 0.028 | 0.413 | 0.754 |
| *Tone_P* | 36,610 | 0.704 | 0.071 | 0.514 | 0.706 | 0.877 |
| *Tone_N* | 36,610 | 0.296 | 0.071 | 0.123 | 0.294 | 0.486 |
| *Tone_A* | 21,344 | 0.000 | 0.105 | -0.268 | 0.005 | 0.227 |
| *Pledge* | 36,610 | 0.308 | 0.462 | 0.000 | 0.000 | 1.000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| *Pledge_ratio* | 36,606 | 0.079 | 0.184 | 0.000 | 0.000 | 0.899 |
| *Complexity* | 36,610 | 8.996 | 0.873 | 6.690 | 9.051 | 10.610 |
| *ROE* | 28,924 | 0.065 | 0.131 | -0.600 | 0.071 | 0.359 |
| *Lev* | 31,083 | 1.418 | 1.022 | 0.570 | 1.092 | 7.380 |
| *SGR* | 32,405 | 0.169 | 0.411 | -0.581 | 0.106 | 2.378 |
| *Size* | 34,485 | 22.045 | 1.084 | 19.767 | 21.985 | 25.061 |
| *B/M* | 30,182 | 0.615 | 0.238 | 0.129 | 0.617 | 1.112 |
| *INST* | 36,610 | 0.335 | 0.249 | 0.000 | 0.325 | 0.862 |
| *Coverage* | 36,610 | 1.352 | 1.185 | 0.000 | 1.386 | 3.738 |
| *Age* | 34,482 | 2.035 | 0.911 | 0.000 | 2.197 | 3.296 |
| *BIGR* | 36,609 | 34.736 | 15.244 | 0.290 | 32.500 | 75.460 |
| *DUAL* | 34,483 | 0.262 | 0.440 | 0.000 | 0.000 | 1.000 |
| *SOE* | 34,483 | 0.385 | 0.487 | 0.000 | 0.000 | 1.000 |
| *DA* | 29,934 | 0.003 | 0.086 | -0.266 | 0.000 | 0.307 |
| *REM* | 29,621 | -0.001 | 0.171 | -0.586 | 0.008 | 0.448 |

Note: This table summarizes descriptive analyses of main variables at firm levels. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles.

**Table 2.** Difference test of means and medians by controlling shareholder's share pledge status

| Variable | *Pledge*=1 | | | *Pledge*=0 | | | Mean t-test | Median z-test |
|---|---|---|---|---|---|---|---|---|
| | Sample size | mean | median | sample size | mean | median | | |
| Tone | 11278 | 0.412 | 0.416 | 25332 | 0.400 | 0.405 | 0.012*** | 39.329*** |
| Tone_P | 11278 | 0.706 | 0.708 | 25332 | 0.700 | 0.703 | 0.006*** | 39.329*** |
| Tone_N | 11278 | 0.294 | 0.292 | 25332 | 0.300 | 0.297 | -0.006*** | 39.329*** |
| *Complexity* | 11278 | 8.903 | 8.964 | 25332 | 9.207 | 9.213 | -0.304*** | 458.712*** |
| ROE | 9706 | 0.068 | 0.073 | 19218 | 0.060 | 0.069 | 0.008*** | 11.755*** |
| Lev | 9895 | 1.405 | 1.077 | 21188 | 1.444 | 1.123 | -0.039*** | 169.524*** |
| SGR | 10833 | 0.150 | 0.096 | 21572 | 0.208 | 0.130 | -0.059*** | 123.397*** |
| *Size* | 11100 | 22.020 | 21.938 | 23385 | 22.097 | 22.057 | -0.076*** | 78.425*** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *B/M* | 9662 | 0.629 | 0.632 | 20520 | 0.587 | 0.585 | 0.041*** | 126.617*** |
| *INST* | 11278 | 0.340 | 0.337 | 25332 | 0.322 | 0.303 | 0.018*** | 63.872*** |
| *Coverage* | 11278 | 1.317 | 1.099 | 25332 | 1.431 | 1.386 | -0.114*** | 52.784*** |
| *Age* | 11100 | 2.053 | 2.398 | 23382 | 1.998 | 2.079 | 0.055*** | 542.549*** |
| *BIGR* | 11278 | 35.661 | 33.480 | 25331 | 32.658 | 30.600 | 3.004*** | 151.820*** |
| DUAL | 11100 | 0.224 | 0.000 | 23383 | 0.341 | 0.000 | -0.117*** | 532.023*** |
| *SOE* | 11100 | 0.517 | 1.000 | 23383 | 0.105 | 0.000 | 0.412*** | 5406.386*** |
| DA | 10096 | -0.001 | 0.000 | 19838 | 0.009 | 0.004 | -0.009*** | 47.205*** |
| *REM* | 10002 | -0.001 | 0.007 | 19619 | -0.002 | 0.009 | 0.002 | 1.178 |

Note: All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 3.** The impact of share pledging of controlling shareholders on the management tone

| Variable | *Tone* | *Tone* | *Tone* | *Tone* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge* | 0.0062*** | 0.0050* | | |
| | (3.02) | (2.10) | | |
| *Pledge_Ratio* | | | 0.0159*** | 0.0078** |
| | | | (6.61) | (2.23) |
| *Complexity* | | -0.0155*** | | -0.0154*** |
| | | (-3.95) | | (-3.96) |
| ROE | | 0.1227*** | | 0.1214*** |
| | | (8.48) | | (8.47) |
| LEV | | -0.0060*** | | -0.0060*** |
| | | (-6.21) | | (-6.18) |
| SGR | | 0.0182*** | | 0.0180*** |
| | | (4.01) | | (3.97) |
| Size | | 0.0083** | | 0.0090** |
| | | (2.70) | | (2.92) |
| B/M | | 0.0012 | | 0.0016 |
| | | (0.12) | | (0.16) |
| INST | | 0.0117 | | 0.0119 |
| | | (1.28) | | (1.31) |

| | | | | |
|---|---|---|---|---|
| Coverage | | 0.0072*** | | 0.0072*** |
| | | (5.09) | | (4.99) |
| Age | | -0.0024 | | -0.0015 |
| | | (-0.30) | | (-0.19) |
| *BIGR* | | 0.0000 | | -0.0000 |
| | | (0.09) | | (-0.10) |
| DUAL | | 0.0010 | | 0.0009 |
| | | (0.46) | | (0.45) |
| SOE | | 0.0090* | | 0.0084* |
| | | (1.97) | | (1.80) |
| DA | | 0.0073 | | 0.0075 |
| | | (1.49) | | (1.52) |
| REM | | -0.0232*** | | -0.0229*** |
| | | (-4.17) | | (-4.14) |
| Constant | 0.5346*** | 0.4651*** | 0.5343*** | 0.4497*** |
| | (128.16) | (8.24) | (129.77) | (8.21) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 34,485 | 22,999 | 34,483 | 22,999 |
| R-squared | 0.547 | 0.583 | 0.547 | 0.583 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 4.** Heterogeneity analysis based on the nature of equity ownership

| Variable | *SOE=1* | *SOE=0* | *SOE=1* | *SOE=0* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge* | -0.0068 | 0.0100*** | | |
| | (-1.60) | (4.91) | | |
| *Pledge_Ratio* | | | -0.0133 | 0.0098** |
| | | | (-0.89) | (2.13) |
| *Complexity* | 0.0052* | 0.0274*** | 0.0052* | 0.0278*** |
| | (1.72) | (10.14) | (1.71) | (10.29) |
| ROE | 0.0209 | 0.0586*** | 0.0208 | 0.0547*** |
| | (1.01) | (3.30) | (1.00) | (3.08) |
| LEV | -0.0093*** | -0.0067*** | -0.0094*** | -0.0065*** |
| | (-8.46) | (-5.48) | (-8.56) | (-5.29) |
| SGR | 0.0259*** | 0.0265*** | 0.0259*** | 0.0266*** |
| | (7.58) | (10.33) | (7.58) | (10.29) |
| Size | 0.0139*** | 0.0080*** | 0.0140*** | 0.0085*** |
| | (7.60) | (4.64) | (7.60) | (4.92) |

| | | | | |
|---|---|---|---|---|
| B/M | -0.0355*** | -0.0030 | -0.0357*** | -0.0033 |
| | (-5.94) | (-0.54) | (-5.98) | (-0.59) |
| INST | -0.0001 | -0.0033 | -0.0004 | -0.0034 |
| | (-0.02) | (-0.61) | (-0.05) | (-0.64) |
| Coverage | 0.0082*** | 0.0154*** | 0.0082*** | 0.0155*** |
| | (5.59) | (13.68) | (5.59) | (13.75) |
| Age | -0.0116*** | -0.0251*** | -0.0116*** | -0.0249*** |
| | (-4.60) | (-12.68) | (-4.59) | (-12.55) |
| *BIGR* | -0.0002*** | -0.0000 | -0.0002*** | -0.0000 |
| | (-2.74) | (-0.31) | (-2.63) | (-0.46) |
| DUAL | 0.0054 | 0.0047** | 0.0054 | 0.0049** |
| | (1.33) | (2.25) | (1.32) | (2.32) |
| DA | 0.0352** | 0.0163 | 0.0348** | 0.0185 |
| | (2.47) | (1.35) | (2.45) | (1.54) |
| REM | -0.0136* | -0.0330*** | -0.0134* | -0.0320*** |
| | (-1.67) | (-5.58) | (-1.65) | (-5.42) |
| Constant | 0.2043*** | 0.1497*** | 0.2034*** | 0.1383*** |
| | (4.78) | (3.62) | (4.74) | (3.35) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 10,070 | 12,929 | 10,070 | 12,929 |
| R-squared | 0.282 | 0.253 | 0.282 | 0.252 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 5.** Heterogeneity analysis based on insider ranks of controlling shareholders

| Variable | *DUAL =1* | *DUAL =0* | *DUAL =1* | *DUAL =0* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge* | 0.0093* | 0.0034 | | |
| | (1.88) | (1.50) | | |
| *Pledge_Ratio* | | | 0.0157*** | 0.0058 |
| | | | (3.43) | (1.45) |
| *Complexity* | -0.0056 | -0.0185*** | -0.0058 | -0.0184*** |
| | (-1.11) | (-4.30) | (-1.17) | (-4.31) |
| ROE | 0.1430*** | 0.1204*** | 0.1401*** | 0.1195*** |
| | (3.68) | (8.22) | (3.66) | (8.07) |
| | -0.0056*** | -0.0057*** | -0.0055*** | -0.0057*** |

| | | | | |
|---|---|---|---|---|
| LEV | (-4.74) | (-4.77) | (-4.81) | (-4.78) |
| SGR | 0.0222*** | 0.0179*** | 0.0219*** | 0.0178*** |
| | (3.37) | (3.70) | (3.37) | (3.64) |
| Size | 0.0081* | 0.0083* | 0.0097** | 0.0088* |
| | (1.97) | (1.86) | (2.37) | (1.93) |
| B/M | -0.0020 | -0.0024 | -0.0006 | -0.0022 |
| | (-0.12) | (-0.19) | (-0.04) | (-0.18) |
| INST | -0.0099 | 0.0101 | -0.0092 | 0.0104 |
| | (-1.44) | (0.88) | (-1.29) | (0.91) |
| Coverage | 0.0081* | 0.0071*** | 0.0081* | 0.0071*** |
| | (2.03) | (5.79) | (2.03) | (5.75) |
| Age | 0.0039 | 0.0032 | 0.0048 | 0.0037 |
| | (0.32) | (0.37) | (0.40) | (0.44) |
| *BIGR* | 0.0010*** | -0.0002 | 0.0009*** | -0.0002 |
| | (3.77) | (-1.01) | (3.05) | (-1.12) |
| DA | -0.0255* | 0.0146** | -0.0265** | 0.0143** |
| | (-2.09) | (2.30) | (-2.15) | (2.24) |
| REM | 0.0169 | 0.0037 | 0.0176 | 0.0037 |
| | (1.67) | (0.52) | (1.60) | (0.52) |
| Constant | 0.3874*** | 0.4791*** | 0.3598*** | 0.4693*** |
| | (3.39) | (5.36) | (3.10) | (5.27) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 5,235 | 17,764 | 5,235 | 17,764 |
| R-squared | 0.698 | 0.592 | 0.698 | 0.592 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 6.** Heterogeneity analysis based on regional institution environment

| Variable | *Aera=1* | *Aera =0* | *Aera =1* | *Aera =0* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge* | 0.0033 | 0.0084** | | |
| | (0.83) | (2.32) | | |
| *Pledge_Ratio* | | | 0.0057 | 0.0090* |
| | | | (0.53) | (1.86) |

| | | | | |
|---|---|---|---|---|
| *Complexity* | -0.0157** | -0.0150*** | -0.0157** | -0.0148*** |
| | (-2.52) | (-4.11) | (-2.52) | (-4.07) |
| ROE | 0.1349*** | 0.0990*** | 0.1340*** | 0.0975*** |
| | (6.45) | (5.04) | (6.32) | (4.66) |
| LEV | -0.0067*** | -0.0049** | -0.0067*** | -0.0049** |
| | (-5.37) | (-2.74) | (-5.42) | (-2.72) |
| SGR | 0.0179*** | 0.0187*** | 0.0177*** | 0.0186*** |
| | (2.97) | (6.01) | (2.94) | (6.25) |
| Size | 0.0071** | 0.0095 | 0.0077** | 0.0104* |
| | (2.30) | (1.70) | (2.42) | (2.04) |
| B/M | -0.0070 | 0.0173 | -0.0066 | 0.0179 |
| | (-0.61) | (1.30) | (-0.59) | (1.34) |
| INST | 0.0062 | 0.0253** | 0.0067 | 0.0248** |
| | (0.54) | (2.44) | (0.58) | (2.40) |
| Coverage | 0.0068*** | 0.0079*** | 0.0068*** | 0.0080*** |
| | (3.27) | (7.07) | (3.24) | (7.17) |
| Age | 0.0079 | -0.0263 | 0.0084 | -0.0250 |
| | (1.03) | (-1.64) | (1.10) | (-1.54) |
| *BIGR* | 0.0000 | -0.0000 | -0.0000 | -0.0000 |
| | (0.07) | (-0.07) | (-0.14) | (-0.17) |
| DA | 0.0028 | -0.0034 | 0.0028 | -0.0034 |
| | (1.17) | (-0.84) | (1.16) | (-0.84) |
| REM | 0.0095 | 0.0075 | 0.0095 | 0.0059 |
| | (1.54) | (0.78) | (1.54) | (0.58) |
| Constant | 0.4876*** | 0.4569*** | 0.4748*** | 0.4375*** |
| | (6.94) | (3.72) | (7.06) | (3.86) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 15,622 | 7,377 | 15,622 | 7,377 |
| R-squared | 0.583 | 0.587 | 0.583 | 0.587 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 7.** Regression Results of Instrumental Variables

| | *Pledge* | *Tone* | *Pledge_ratio* | *Tone* |
|---|---|---|---|---|

| Variable | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| *Pledge_hy* | 0.830*** | | | |
| | (16.624) | | | |
| *Pledge* | | 0.003** | | |
| | | (2.364) | | |
| *Pledge_ratio_hy* | | | 0.867*** | |
| | | | (12.179) | |
| *Pledge_ratio* | | | | 0.006*** |
| | | | | (3.316) |
| *Complexity* | 0.027*** | 0.017*** | 0.007*** | 0.017*** |
| | (4.348) | (9.207) | (2.792) | (9.449) |
| ROE | -0.126*** | 0.041*** | 0.079*** | 0.032** |
| | (-2.814) | (3.178) | (3.807) | (2.419) |
| LEV | 0.028*** | -0.009*** | 0.007*** | -0.009*** |
| | (9.961) | (-10.015) | (7.467) | (-10.681) |
| SGR | 0.050*** | 0.025*** | 0.038*** | 0.024*** |
| | (7.204) | (11.855) | (9.564) | (8.794) |
| Size | 0.009** | 0.009*** | -0.014*** | 0.010*** |
| | (2.163) | (7.039) | (-8.311) | (6.928) |
| B/M | 0.024* | -0.022*** | 0.034*** | -0.023*** |
| | (1.722) | (-5.418) | (6.431) | (-5.502) |
| INST | -0.055*** | -0.005 | -0.053*** | -0.003 |
| | (-3.723) | (-1.022) | (-7.892) | (-0.499) |
| Coverage | 0.006* | 0.013*** | -0.001 | 0.013*** |
| | (1.761) | (14.035) | (-0.816) | (14.372) |
| Age | 0.019*** | -0.022*** | 0.003 | -0.022*** |
| | (3.516) | (-14.319) | (1.332) | (-14.415) |
| *BIGR* | 0.001*** | -0.000** | 0.002*** | -0.000* |
| | (4.758) | (-2.036) | (23.155) | (-1.947) |
| DUAL | 0.023*** | 0.005** | 0.007** | 0.005*** |
| | (3.179) | (2.533) | (2.173) | (2.604) |
| SOE | -0.416*** | 0.032*** | -0.125*** | 0.030*** |
| | (-60.951) | (4.079) | (-44.345) | (4.597) |
| DA | 0.231*** | 0.025** | 0.085*** | 0.025** |
| | (7.365) | (2.525) | (5.569) | (2.542) |
| REM | 0.073*** | -0.029*** | 0.026*** | -0.029*** |
| | (4.262) | (-5.918) | (3.342) | (-5.908) |
| Constant | 0.211*** | 0.195*** | 0.219** | 0.214*** |
| | (5.453) | (6.308) | (2.293) | (7.618) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 22999 | 22999 | 22999 | 22999 |
| R-squared | 0.1933 | 0.2518 | 0.2662 | 0.2542 |
| Anderson-canon statistic | - | 241.816*** | - | 191.058*** |

| | | | | |
|---|---|---|---|---|
| Cragg-Donald statistic | - | 243.908*** | - | 192.282*** |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 8.** Robustness Regression Results of PSM

| Variable | *Tone* | *Tone* | *Tone* | *Tone* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge* | 0.0067*** | 0.0056** | | |
| | (2.97) | (2.45) | | |
| *Pledge_Ratio* | | | 0.0112*** | 0.0045** |
| | | | (3.55) | (2.27) |
| *Complexity* | | 0.0306*** | | 0.0308*** |
| | | (10.26) | | (10.34) |
| ROE | | 0.0756*** | | 0.0740*** |
| | | (4.01) | | (3.91) |
| LEV | | -0.0053*** | | -0.0052*** |
| | | (-4.90) | | (-4.80) |
| SGR | | 0.0145*** | | 0.0143*** |
| | | (6.33) | | (6.20) |
| Size | | 0.0075*** | | 0.0076*** |
| | | (4.21) | | (4.26) |
| B/M | | -0.0128** | | -0.0134** |
| | | (-2.19) | | (-2.30) |
| INST | | -0.0092 | | -0.0088 |
| | | (-1.61) | | (-1.52) |
| Coverage | | 0.0156*** | | 0.0157*** |
| | | (13.10) | | (13.14) |
| Age | | -0.0225*** | | -0.0226*** |
| | | (-10.78) | | (-10.80) |
| *BIGR* | | 0.0000 | | -0.0000 |
| | | (0.26) | | (-0.01) |
| DUAL | | 0.0042* | | 0.0042* |
| | | (1.83) | | (1.82) |
| SOE | | 0.0140*** | | 0.0138*** |
| | | (3.80) | | (3.76) |
| DA | | 0.0202* | | 0.0210* |
| | | (1.87) | | (1.95) |
| REM | | -0.0233*** | | -0.0229*** |
| | | (-3.71) | | (-3.65) |
| | 0.3705*** | 0.0176 | 0.3719*** | 0.0167 |

| | | | | |
|---|---|---|---|---|
| Constant | (31.13) | (0.42) | (31.32) | (0.40) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 14,668 | 11,436 | 14,668 | 11,436 |
| R-squared | 0.147 | 0.238 | 0.148 | 0.238 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 9.** Difference-in-differences model

| Variable | *Tone* | *Tone* |
|---|---|---|
| | (1) | (2) |
| *Treat* | -0.0159 | 0.0031 |
| | (-1.73) | (0.63) |
| *Time* | 0.2085*** | 0.0409*** |
| | (34.06) | (2.98) |
| *Treat* Time* | 0.0136*** | 0.0081** |
| | (4.24) | (2.39) |
| *Complexity* | | -0.0154*** |
| | | (-3.95) |
| ROE | | 0.1225*** |
| | | (8.32) |
| LEV | | -0.0060*** |
| | | (-6.11) |
| SGR | | 0.0183*** |
| | | (4.03) |
| Size | | 0.0095** |
| | | (2.79) |
| B/M | | 0.0025 |
| | | (0.24) |
| INST | | 0.0095 |
| | | (1.09) |
| | | 0.0073*** |

| | | |
|---|---|---|
| Coverage | | (5.15) |
| Age | | 0.0020 |
| | | (0.25) |
| *BIGR* | | 0.0000 |
| | | (0.13) |
| DUAL | | 0.0012 |
| | | (0.55) |
| DA | | 0.0075 |
| | | (1.56) |
| REM | | -0.0233*** |
| | | (-4.18) |
| Constant | 0.5444*** | 0.4359*** |
| | (84.56) | (7.38) |
| *Firm FE* | Yes | Yes |
| *Year FE* | Yes | Yes |
| Observations | 34,483 | 22,999 |
| R-squared | 0.547 | 0.583 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 10.** Robustness Regression Results with Different Dependent Variables

| Variable | *Tone_a* | *Tone_a* | *Tone_a* | *Tone_a* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge* | 0.0018*** | 0.0057*** | | |
| | (3.14) | (2.93) | | |
| *Pledge_Ratio* | | | 0.0048** | 0.0124*** |
| | | | (2.23) | (2.75) |
| *Complexity* | | 0.0107*** | | 0.0107*** |
| | | (5.17) | | (5.21) |
| ROE | | -0.0066 | | -0.0080 |
| | | (-0.47) | | (-0.58) |
| LEV | | -0.0013 | | -0.0012 |
| | | (-1.38) | | (-1.27) |

| | | | | |
|---|---|---|---|---|
| SGR | | 0.0084*** | | 0.0082*** |
| | | (4.04) | | (3.92) |
| Size | | -0.0077*** | | -0.0075*** |
| | | (-6.11) | | (-5.94) |
| B/M | | -0.0393*** | | -0.0397*** |
| | | (-9.09) | | (-9.18) |
| INST | | -0.0077* | | -0.0074* |
| | | (-1.74) | | (-1.68) |
| Coverage | | 0.0110*** | | 0.0110*** |
| | | (9.41) | | (9.43) |
| Age | | 0.0058*** | | 0.0059*** |
| | | (3.61) | | (3.67) |
| *BIGR* | | -0.0001 | | -0.0001 |
| | | (-0.87) | | (-1.27) |
| DUAL | | 0.0045** | | 0.0045** |
| | | (2.25) | | (2.28) |
| SOE | | 0.0170*** | | 0.0162*** |
| | | (7.46) | | (7.42) |
| DA | | 0.0151 | | 0.0152 |
| | | (1.57) | | (1.58) |
| REM | | -0.0096* | | -0.0094* |
| | | (-1.91) | | (-1.88) |
| Constant | -0.0011** | 0.0632** | -0.0010** | 0.0600** |
| | (-2.17) | (2.13) | (-2.15) | (2.02) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 21,337 | 17,178 | 21,337 | 17,178 |
| R-squared | 0.105 | 0.213 | 0.123 | 0.209 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 11.** Robustness Regression Results with Changed Independent Variables

| Variable | *Tone* | *Tone* | *Tone* | *Tone* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge_gds* | 0.0037*** | 0.0050*** | | |
| | (3.28) | (3.60) | | |

| | | | | |
|---|---|---|---|---|
| *Pledge_Ratio2* | | | 0.0113** | 0.0119* |
| | | | (2.16) | (1.85) |
| *Complexity* | 0.0176*** | | | 0.0178*** |
| | (8.68) | | | (8.80) |
| ROE | 0.0387*** | | | 0.0368*** |
| | (2.85) | | | (2.71) |
| LEV | -0.0087*** | | | -0.0086*** |
| | (-10.59) | | | (-10.46) |
| SGR | 0.0258*** | | | 0.0260*** |
| | (12.38) | | | (12.52) |
| Size | 0.0087*** | | | 0.0089*** |
| | (7.07) | | | (7.25) |
| B/M | -0.0217*** | | | -0.0217*** |
| | (-5.38) | | | (-5.38) |
| INST | -0.0054 | | | -0.0056 |
| | (-1.26) | | | (-1.31) |
| Coverage | 0.0131*** | | | 0.0132*** |
| | (14.62) | | | (14.74) |
| Age | -0.0215*** | | | -0.0218*** |
| | (-14.33) | | | (-14.48) |
| *BIGR* | -0.0001 | | | -0.0001** |
| | (-1.55) | | | (-2.11) |
| DUAL | 0.0053*** | | | 0.0054*** |
| | (2.84) | | | (2.87) |
| SOE | 0.0238*** | | | 0.0223*** |
| | (11.36) | | | (11.07) |
| DA | 0.0295*** | | | 0.0305*** |
| | (3.19) | | | (3.30) |
| REM | -0.0279*** | | | -0.0275*** |
| | (-1.91) | | | (-1.88) |
| Constant | 0.4826*** | 0.2133*** | 0.4827*** | 0.2098*** |
| | (70.38) | (7.35) | (70.28) | (7.23) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 34,485 | 22,999 | 34,483 | 22,999 |
| R-squared | 0.195 | 0.259 | 0.195 | 0.259 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 12.** Mechanism test based on Agency conflicts

| Variable | Equity balance | | Controlling shareholder pledge ratio | | Listed company profit growth rate | |
|---|---|---|---|---|---|---|
| | Strong | Weak | High | Low | High | Low |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Pledge_Ratio* | 0.0100 | 0.0106* | 0.0140* | 0.0037 | 0.0028 | 0.0152** |
| | (1.10) | (1.85) | (1.86) | (0.70) | (0.45) | (2.52) |
| *Complexity* | 0.0120*** | 0.0268*** | 0.0252*** | 0.0103*** | 0.0190*** | 0.0157*** |
| | (4.69) | (8.16) | (8.63) | (3.69) | (6.35) | (5.71) |
| ROE | 0.0473*** | 0.0187 | 0.0287 | 0.0343* | 0.0380* | 0.0380** |
| | (2.62) | (0.89) | (1.42) | (1.87) | (1.79) | (2.17) |
| LEV | -0.0087*** | -0.0[illegible]*** | -0.0072*** | -0.0103*** | -0.0083*** | -0.0077*** |
| | (-8.52) | (-5.78) | (-6.08) | (-8.99) | (-7.65) | (-6.05) |
| SGR | 0.0284*** | 0.0228*** | 0.0233*** | 0.0295*** | 0.0266*** | 0.0254*** |
| | (10.26) | (7.30) | (7.75) | (10.35) | (8.41) | (9.13) |
| Size | 0.0132*** | 0.0036* | 0.0104*** | 0.0090*** | 0.0062*** | 0.0122*** |
| | (8.15) | (1.84) | (5.69) | (5.35) | (3.49) | (7.05) |
| B/M | -0.0318*** | -0.0097 | -0.0064 | -0.0358*** | -0.0240*** | -0.0184*** |
| | (-6.10) | (-1.50) | (-1.08) | (-6.55) | (-3.96) | (-3.38) |
| INST | -0.0069 | -0.0040 | -0.0030 | -0.0142** | -0.0056 | -0.0064 |
| | (-1.08) | (-0.66) | (-0.46) | (-2.43) | (-0.90) | (-1.07) |
| Coverage | 0.0111*** | 0.0156*** | 0.0134*** | 0.0126*** | 0.0157*** | 0.0108*** |
| | (8.94) | (11.93) | (10.31) | (10.10) | (11.88) | (8.91) |
| Age | -0.0184*** | -0.[illegible]*** | -0.0278*** | -0.0149*** | -0.0226*** | -0.0215*** |
| | (-8.46) | (-9.96) | (-12.73) | (-7.18) | (-10.14) | (-10.49) |
| *BIGR* | -0.0000 | -0.0002** | -0.0004** | -0.0002** | -0.0001 | -0.0002** |
| | (-0.48) | (-2.30) | (-2.50) | (-1.98) | (-0.91) | (-2.12) |
| DUAL | 0.0070** | 0.0045* | 0.0027 | 0.0087*** | 0.0024 | 0.0083*** |
| | (2.45) | (1.80) | (1.04) | (3.24) | (0.90) | (3.18) |
| DA | 0.0202*** | 0.0267*** | 0.0246*** | 0.0198*** | 0.0169*** | 0.0264*** |
| | (7.80) | (7.53) | (8.47) | (6.80) | (5.32) | (9.76) |
| REM | 0.0437*** | 0.0098 | 0.0104 | 0.0457*** | 0.0224 | 0.0325*** |
| | (3.53) | (0.70) | (0.79) | (3.53) | (1.58) | (2.66) |
| Constant | 0.1521*** | 0.2604*** | 0.1491*** | 0.2501*** | 0.2441*** | 0.1751*** |
| | (4.00) | (5.65) | (3.38) | (6.39) | (5.77) | (4.36) |
| *Firm FE* | Yes | Yes | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 13,061 | 9,938 | 11,219 | 11,780 | 11,245 | 11,754 |
| R-squared | 0.268 | 0.252 | 0.271 | 0.257 | 0.247 | 0.274 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 13.** Mechanism test based on Information Risks

| | *Coverage=1* | *Coverage=0* | *VIST=1* | *VIST=0* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge_Ratio* | 0.0062 | 0.0092* | 0.0096 | 0.0134* |
| | (0.65) | (1.92) | (1.27) | (1.84) |
| *Complexity* | 0.0293*** | 0.0131*** | -0.0082 | -0.0169*** |
| | (6.67) | (5.75) | (-1.47) | (-4.29) |
| ROE | 0.0072 | 0.0438*** | 0.1614*** | 0.0964*** |
| | (0.25) | (2.90) | (5.52) | (5.40) |
| LEV | -0.0065*** | -0.0106*** | -0.0057*** | -0.0082*** |
| | (-4.91) | (-9.98) | (-3.19) | (-4.07) |
| SGR | 0.0298*** | 0.0239*** | 0.0219*** | 0.0284*** |
| | (7.05) | (10.13) | (6.08) | (3.63) |
| Size | 0.0140*** | 0.0085*** | -0.0018 | 0.0107* |
| | (4.70) | (6.26) | (-0.33) | (1.76) |
| B/M | 0.0094 | -0.0369*** | -0.0339** | 0.0089 |
| | (1.15) | (-7.89) | (-2.05) | (0.59) |
| INST | -0.0021 | -0.0074 | 0.0177 | 0.0104 |
| | (-0.21) | (-1.54) | (1.59) | (0.89) |
| Coverage | | | 0.0017 | 0.0073*** |
| | | | (0.84) | (3.77) |
| Age | -0.0321*** | -0.0172*** | -0.0104 | -0.0038 |
| | (-10.42) | (-9.94) | (-0.92) | (-0.50) |
| *BIGR* | -0.0001 | -0.0001* | 0.0002 | -0.0003 |
| | (-0.58) | (-1.69) | (0.63) | (-1.66) |
| DUAL | 0.0065 | 0.0048** | 0.0024 | 0.0002 |
| | (1.63) | (2.27) | (0.45) | (0.08) |
| DA | 0.0338*** | 0.0188*** | -0.0130 | 0.0214*** |
| | (8.03) | (8.02) | (-0.82) | (3.12) |
| REM | 0.0700*** | 0.0119 | -0.0066 | 0.0189* |
| | (3.59) | (1.14) | (-0.43) | (1.88) |
| Constant | -0.0110 | 0.2671*** | -0.0249** | -0.0225** |
| | (-0.17) | (8.22) | (-2.32) | (-2.91) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 5,557 | 17,442 | 9,410 | 13,589 |
| R-squared | 0.220 | 0.246 | 0.623 | 0.631 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 14.** Regression results based on positive tone

| Variable | *Tone_P* | *Tone_P* | *Tone_P* | *Tone_P* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge* | 0.0009** | 0.0031*** | | |
| | (2.25) | (3.39) | | |
| *Pledge_Ratio* | | | 0.0048*** | 0.0043** |
| | | | (2.79) | (2.01) |
| *Complexity* | | 0.0088*** | | 0.0089*** |
| | | (8.71) | | (8.77) |
| ROE | | 0.0194*** | | 0.0187*** |
| | | (2.86) | | (2.76) |
| LEV | | -0.0044*** | | -0.0043*** |
| | | (-10.60) | | (-10.47) |
| SGR | | 0.0130*** | | 0.0130*** |
| | | (12.49) | | (12.43) |
| Size | | 0.0044*** | | 0.0045*** |
| | | (7.10) | | (7.24) |
| B/M | | -0.0107*** | | -0.0108*** |
| | | (-5.32) | | (-5.37) |
| INST | | -0.0029 | | -0.0029 |
| | | (-1.35) | | (-1.33) |
| Coverage | | 0.0065*** | | 0.0066*** |
| | | (14.67) | | (14.72) |
| Age | | -0.0109*** | | -0.0108*** |
| | | (-14.48) | | (-14.43) |
| *BIGR* | | -0.0001* | | -0.0001** |
| | | (-1.78) | | (-2.00) |
| DUAL | | 0.0027*** | | 0.0027*** |
| | | (2.83) | | (2.87) |
| SOE | | 0.0121*** | | 0.0113*** |
| | | (11.24) | | (11.04) |
| DA | | 0.0149*** | | 0.0152*** |
| | | (3.21) | | (3.29) |
| REM | | -0.0139*** | | -0.0138*** |
| | | (-5.84) | | (-5.79) |
| Constant | 0.7414*** | 0.6062*** | 0.7412*** | 0.6048*** |
| | (215.87) | (41.79) | (215.89) | (41.68) |

| | | | | |
|---|---|---|---|---|
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 34,485 | 22,999 | 34,483 | 22,999 |
| R-squared | 0.195 | 0.259 | 0.195 | 0.259 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

**Table 15.** Regression results based on negative tone

| Variable | *Tone_N* | *Tone_N* | *Tone_N* | *Tone_N* |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *Pledge* | -0.0009** | -0.0031*** | | |
| | (-2.25) | (-3.39) | | |
| *Pledge_Ratio* | | | -0.0048*** | -0.0043** |
| | | | (-2.79) | (-2.01) |
| *Complexity* | | -0.0088*** | | -0.0089*** |
| | | (-8.71) | | (-8.77) |
| ROE | | -0.0194*** | | -0.0187*** |
| | | (-2.86) | | (-2.76) |
| LEV | | 0.0044*** | | 0.0043*** |
| | | (10.60) | | (10.47) |
| SGR | | -0.0130*** | | -0.0130*** |
| | | (-12.49) | | (-12.43) |
| Size | | -0.0044*** | | -0.0045*** |
| | | (-7.10) | | (-7.24) |
| B/M | | 0.0107*** | | 0.0108*** |
| | | (5.32) | | (5.37) |
| INST | | 0.0029 | | 0.0029 |
| | | (1.35) | | (1.33) |
| Coverage | | -0.0065*** | | -0.0066*** |
| | | (-14.67) | | (-14.72) |
| Age | | 0.0109*** | | 0.0108*** |
| | | (14.48) | | (14.43) |
| *BIGR* | | 0.0001* | | 0.0001** |
| | | (1.78) | | (2.00) |
| DUAL | | -0.0027*** | | -0.0027*** |
| | | (-2.83) | | (-2.87) |
| SOE | | -0.0121*** | | -0.0113*** |
| | | (-11.24) | | (-11.04) |

| | | | | |
|---|---|---|---|---|
| DA | | -0.0149*** | | -0.0152*** |
| | | (-3.21) | | (-3.29) |
| REM | | 0.0139*** | | 0.0138*** |
| | | (5.84) | | (5.79) |
| Constant | 0.2586*** | 0.3938*** | 0.2588*** | 0.3952*** |
| | (75.31) | (27.15) | (75.37) | (27.24) |
| *Firm FE* | Yes | Yes | Yes | Yes |
| *Year FE* | Yes | Yes | Yes | Yes |
| Observations | 34,485 | 22,999 | 34,483 | 22,999 |
| R-squared | 0.195 | 0.259 | 0.195 | 0.259 |

Note: The t-statistics reported in brackets are calculated using standard errors clustered at firm level. All variables are defined in Appendix 1. Financial data are in RMB. All continuous variables are winsorized at the first and 99th percentiles. *, ** and *** represent significant level at the 10%, 5% and 1%, respectively.

## Appendix:

A1. Definition and explanation of main variables

| **Variable Name** | **Variable symbol** | **Variable Definitions** |
|---|---|---|
| **Dependent Variable** | | |
| Management Tone | *Tone* | (Tone_P－Tone_N) / (Tone_P + Tone_N) |
| Positive management tone | *Tone_P* | The proportion of positive tone words in the management discussion and analysis section of the annual reports of listed companies relative to the total number of positive and negative tone words. |

| Variable Name | Variable symbol | Variable Definitions |
|---|---|---|
| Management negative tone | *Tone_N* | The proportion of negative tone words in the management discussion and analysis section of the annual reports of listed companies relative to the total number of positive and negative tone words. |
| **Independent variable.** | | |
| Dummy variable for controlling shareholder's share pledging. | *Pledge* | If there exists an share pledging on the controlling shareholder's shares in the listed company for the year, the value is 1, otherwise it is 0. |
| Size of controlling shareholder's share pledging. | *Pledge_ratio* | The proportion of pledged shares by the controlling shareholder of the listed company to the total number of shares of the company (%). |
| | *Pledge_ratio 2* | The proportion of pledged shares held by controlling shareholders of a listed company to the total shares outstanding of the company (%). |
| **Control Variables** | | |
| The complexity of text. | *Complexity* | The natural logarithm of the frequency of appearance of accounting and professional |

| Variable Name | Variable symbol | Variable Definitions |
|---|---|---|
| | | terms in the management discussion and analysis section of the annual reports of listed companies. The accounting and professional terms are sourced from the Lingoes library. |
| Net Return on Assets | *ROE* | The net profit of a listed company divided by its net asset amount |
| The total assets to liabilities ratio | *Lev* | The ratio of total liabilities to total assets of the listed company |
| Total revenue growth rate. | *SGR* | The current main operating income of the listed company divided by its previous main operating income. |
| Enterprise size | *Size* | Ln(1+ Total assets of a listed company) |
| Book-to-Market Ratio | *B/M* | The book value of a listed company divided by its market value. |
| Institutional ownership percentage | *INST* | The sum of the percentages of shares held by financial institutions in a listed company |
| Analyst coverage | *Coverage* | The natural logarithm of the number of analysts (or teams of analysts) who have conducted tracking analysis on the listed company within a year. |

| Variable Name | Variable symbol | Variable Definitions |
|---|---|---|
| Enterprise age | *Age* | Ln(1+ Enterprise age) |
| The percentage of shares held by the largest shareholder | *BIGR* | The shareholding of the largest shareholder of a listed company divided by the total number of shares of the listed company." |
| Job consolidation | *DUAL* | Determine whether the positions of Chairman and General Manager are consolidated into one, assign 1 if yes, otherwise 0 |
| Company type | *SOE* | If the listed company is a state-owned holding enterprise, assign 1, otherwise assign 0. |
| Earnings management using accruals | *DA* | Using the modified Jones (1991) model, Residuals obtained from regression at the industry-year level, and then measured by absolute value |
| Earnings management using real activities | *REM* | Referring to the real earnings management model proposed by Roychowdhury (2006) |
| Total asset growth rate | *TAGR* | The current total assets of the listed company divided by its previous total assets |
| Weekly stock volatility | *SIGMA* | The standard deviation of the weekly return of the company's stock |

| Variable Name | Variable symbol | Variable Definitions |
|---|---|---|
| Weekly stock returns | *RET* | The average weekly return of the company's stock |
| Stock turnover rate | *Turnover* | The trading volume of the listed company's stock / total outstanding shares×100% |
| Illiquidity indicators | *Amihud* | The illiquidity measure of the stock obtained using the calculation method proposed by Amihud (2002). |