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**Article**

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# Pledgee competition, strategic disclosure, and future crash risk



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## ABSTRACT

We investigate whether pledgee competition affects the disclosure choice of firms whose controlling shareholders pledge their shares. We find that pledgee competition is positively related to pledge firms' annual report tone management. This positive relationship is stronger for pledge firms with lower credit quality and non-state-owned enterprise pledge firms. Further corroborating our results, higher pledgee competition increases the future crash risk of pledge firms. Collectively, our results suggest that competition pressure induces pledgees to lower their monitoring incentives to remain competitive in the marketplace, thus leading to pledge firms' bad news hoarding behavior.

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## 1. Introduction

In recent years, approximately 40% of Chinese listed firms' controlling shareholders have pledged their shares as collateral to raise funds. Share pledging enables them to easily obtain low-cost loans without losing control of their firms. In the process, the pledgees (i.e., financial institutions, such as banks and securities firms) retain legal ownership of the shares and become responsible for monitoring the controlling shareholders (Tan and Wu, 2013; Asija et al., 2016). The Guidelines on Share Pledge Repo Transactions, Registration and Settlement (Guidelines, hereafter), which came into effect in May 2013, allows securities companies to engage in share pledging. This has resulted in the deregulation of the pledgee market and increasingly competitive

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environments. We investigate whether competition affects pledgees' monitoring practices by examining the disclosure choices of pledge firms.

Studies consider the monitoring effect of pledgees on accounting conservatism (Tan and Wu, 2013) and on the earnings management of pledge firms (Asija et al., 2016). However, less is known about how the effect varies with pledgee competition. Studies show that bank competition diminishes banks' incentives for both ex-ante screening (Marquez, 2002; Dell'Araccia and Marquez, 2006) and ex-post monitoring (Bushman et al., 2016). Given that pledgees are responsible for monitoring controlling shareholders (i.e., borrowers) in the pledge loan contract, similar to banks in loan contracts, whether pledgee competition affects the efficacy of pledgee monitoring is of particular concern. Meanwhile, the literature only focuses on the quantitative information of pledge firms and provides an incomplete picture of their disclosure choices. As readable and clear narrative information is an important input into lenders' lending and monitoring practices (Ertugrul et al., 2017), pledgees may request narrative information to learn more about pledge firms.

Using annual report tone management to gauge narrative disclosure choice, we find robust evidence that greater competition increases pledge firms' incentive to engage in tone management. By allowing securities companies to undertake share pledging, deregulation increases the competition among pledgees, diminishes their ability to earn profit, and thus pressures them to lower their monitoring incentives. As a result, higher competition is negatively related to ex-post monitoring. This increases the incentive of pledge firms to use tone management to maintain the share price, which is the primary determinant of loan terms in a pledge loan contract.

We next examine the cross-sectional variation in the impact of competition on pledgees' monitoring incentives. First, we find the positive relationship between competition and pledge firms' tone management to be stronger for firms with lower credit quality. Pledgees may lower ex-post monitoring to a larger extent for firms with lower credit quality, which are subject to higher default risk. To avoid share price reduction and market capitalization erosion, such firms engage in tone management more. Second, we find the negative effect of competition to be present primarily among non-state-owned enterprises (non-SOEs). In the case of default, pledgees may liquidate pledged shares to recover dues. However, there exist legal restrictions to selling the shares of state-owned enterprises (SOEs; Xie et al., 2016). Thus, the controlling shareholders of non-SOEs are more vulnerable to losing control rights in the event of default and have higher incentives to use tone management to increase stock price and avoid default.

To further investigate the negative impact of competition, we examine the relationship between pledgee competition and pledge firms' stock price crash risk. We find that pledgee competition increases pledge firms' future crash risk. Prolonged bad news hoarding through tone management in annual reports can lead to severely overvalued stock prices. However, there is a limit to the amount of bad information that a firm can hide from the market. When the accumulated bad news reaches a tipping point, it is suddenly released to the market all at once, causing the stock price to crash (Jin and Myers, 2006; Hutton et al., 2009; Kim et al., 2016). Hence, the impact of pledgee competition on future crash risk offers corroborative evidence that competitive pressure induces pledgees to lower their monitoring incentives.

To address the potential endogeneity problem, we take advantage of the enforcement of the Guidelines in 2013, which introduced an exogenous shock that lowered the barriers to the share pledging market and increased pledgee competition. If the high annual report tone management (crash risk) of pledge firms results from the fact that competition pressures pledgees to lower their monitoring incentives, the positive relationship between pledgee competition and annual report tone management (crash risk) should be exacerbated after the enforcement of the Guidelines. We conduct a difference-in-differences design and find consistent evidence.

We perform several supplemental tests to support our primary results. First, to rule out alternative explanations, we investigate whether the sensitivity of tone management and crash risk to the pledged amount changes after the Guidelines. Two alternative explanations for our results exist. The first alternative explanation is that increased competition forces pledgees to lower their screening standards. That is, the competition attracts more poor-quality borrowers and it is endogenous that we observe firms experiencing poorer reporting quality (greater tone management) and greater crash risk. Under the first alternative explanation, we predict the sensitivity of tone management and crash risk to the pledged amount to increase from the pre- to post-Guideline period. The second alternative explanation is that it becomes easier to borrow against

pledging due to the competition and that managers hide more bad news to support stock prices due to a greater amount of pledging. Following this reasoning, we expect the sensitivity of tone management and crash risk to the pledged amount to remain the same after the Guidelines. Thus, we investigate whether the sensitivity of tone management and crash risk to the pledged amount changed after the Guidelines. We find a decreased sensitivity from the pre- to post-Guideline period, which is inconsistent with the two alternative explanations above.

Second, to further examine the impact of the Guidelines on pledgee competition, we investigate whether the pledging activities of each pledgee increased from the pre- to post-Guideline period. We find consistent evidence supporting the conjecture that the Guidelines increase competition and that competition requires pledgees to develop new business. In turn, they cannot spend much time monitoring their existing business.

Our results contribute to two lines of research. First, we enhance our understanding of how the pledgees' monitoring effect varies with competition. Studies show how competition affects banks' monitoring and screening practices, finding higher competition to be associated with more low-quality borrowers obtaining financing (Marquez, 2002), the increased risk of banks' loan portfolios (Dell'Ariccia and Marquez, 2006), the increased stand-alone risk of individual banks, the increased sensitivity of a bank's downside equity risk to system-wide distress (Bushman et al., 2016), and the decreased use of financial statement verification (Lisowsky et al., 2017). An important difference with our research is that unlike loan contracts without collateral, competition typically changes pledgees' behavior in loan contracts with collateral (i.e., share pledge contracts). We document that greater competition can lower pledgees' monitoring incentives. To our knowledge, our study is one of the few, if not the first, to provide evidence on the negative impact of competition on pledgees' monitoring role.

Second, we provide evidence on how share pledges affect firms' strategic narrative discourse. We find an economically significant link between pledgee competition and pledge firms' tone management. Studies find that pledge firms manipulate earnings and only focus on quantitative information (Tan and Wu, 2013; Asija et al., 2016; Huang and Xue, 2016). Given that quantitative information alone provides investors with an incomplete picture of a firm's economic circumstances (Huang et al., 2014) and that tone can be used as a tool to bury adverse news in long documents (Ertugrul et al., 2017) and affect investors' perceptions of the firm (Davis et al., 2012; Baginski et al., 2016), we investigate whether pledge firms engage in tone management for strategic purposes. We extend the literature on earnings management in pledge loan contracts by providing evidence of the use of qualitative tone management.

The remainder of this paper proceeds as follows. Section 2 reviews the background and develops the hypotheses. Section 3 introduces the sample and research design. Section 4 provides the empirical evidence. Section 5 performs additional analyses. Section 6 concludes.

## 2. Institutional background and hypothesis development

### 2.1. Institutional background

#### 2.1.1. Development of share pledges in the Chinese capital market

The controlling shareholders of listed firms may pledge their personal stockholdings as collateral for a loan, thus enabling them to easily raise funds. This allows them to avoid selling their stock and helps them maintain their control rights.

As pledging represents loan contracts with payoffs contingent on a firm's share price, a large decrease in stock price may trigger default. In China, as in many other countries, loan contracts with pledged stocks include the terms of a collateral maintenance ratio. If the value of the collateral does not meet the requirement, the pledgee can terminate the loan contract and sell the pledged shares as part of its recovery. Therefore, the controlling shareholders may have incentives to engage in activities that focus on maintaining stock prices (Huang and Xue, 2016; Xie et al., 2016, 2017).

In the Chinese capital market, share pledges are widely used by controlling shareholders. As shown in column 1 of Table 1, the number of pledge firms increased from 31 in 2003 to 1363 in 2016. This is consistent with share pledges being more extensively used by the controlling shareholders of Chinese listed firms over time. The percentage of the market represented by pledge firms, in terms of the number of observations, increased

Table 1  
Share pledge trend in the Chinese capital market.

Year	(1) No. of pledge firms	(2) Pledge firms in the total market (%)	(3) Market capitalization of pledged shares (billion RMB)	(4) Pledge ratio (%)
2003	31	2.45	11.71	19.89
2004	112	8.26	38.74	21.82
2005	193	14.28	49.42	22.02
2006	200	13.94	69.97	20.02
2007	208	13.43	208.70	20.06
2008	268	16.72	193.79	19.22
2009	313	17.87	300.73	21.23
2010	331	15.71	326.88	17.42
2011	447	19.09	440.57	17.22
2012	545	22.06	445.50	17.88
2013	699	27.79	579.94	17.81
2014	853	32.41	966.19	18.19
2015	1158	41.02	2281.38	17.07
2016	1363	43.73	2926.43	18.58
Total	6721	–	–	–

This table reports the share pledge trend in the Chinese capital market. Pledge firms are those whose controlling shareholders pledge their shares in year  $t$ . The pledge ratio is the percentage of pledged shares in the controlling shareholders' shareholdings.

from 2.45% in 2003 to 43.73% in 2016, as shown in column 2. The increase in the percentage of pledge firms is stronger after 2013, when the Guidelines came into effect. In addition, the market capitalization of pledged shares increased from RMB11.71 billion in 2003 to RMB2,926.43 billion in 2016, as shown in column 3. The average pledge ratio is shown in column 4. It shows a time-series average of 19.17% from 2003 to 2016.

### 2.1.2. Deregulation of the share pledging market

To further enhance the financing channel through share pledging, the Chinese government decided to start share pledge repo transactions in 2013, with the goal of improving the efficiency of the registration and settlement process and reducing the cost of pledging. As described in Section 1, the Guidelines came into effect in May 2013. Since then, securities companies have been assigned to engage in the share pledge repo transactions business and have been allowed to enter the pledge market.

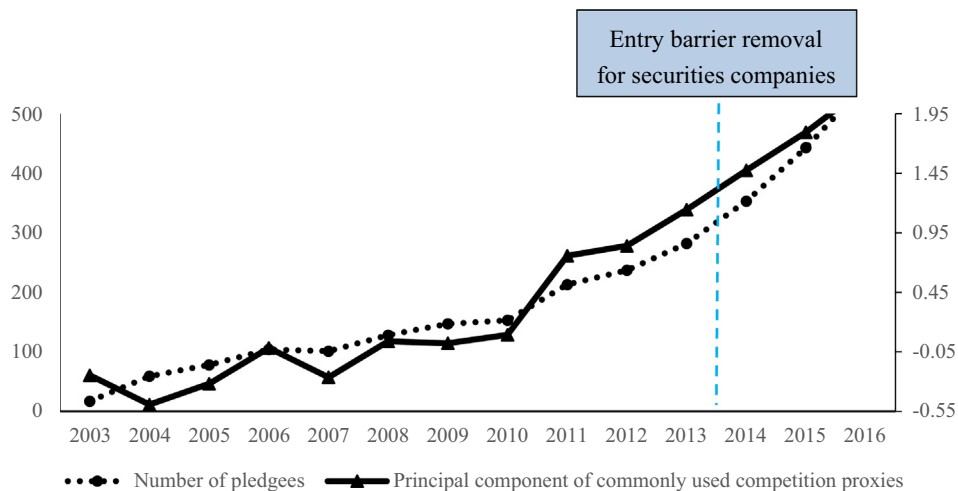


Fig. 1. Pledgee market competition trend. This figure plots two competition measures from 2003 to 2016: (i) the number of pledgees engaging in share pledging and (ii) the principal component of three commonly used proxies of competition, namely, market concentration (measured as the Herfindahl–Hirschman Index), the four-pledgee concentration ratio, and the total number of pledgees. It also highlights when the Shanghai and Shenzhen Stock Exchanges removed the entry barrier for securities companies to the share pledging market via the Guidelines (i.e., in 2013).

Fig. 1 plots two competition measures from 2003 to 2016: (i) the number of pledgees engaging in share pledging and (ii) the principal component of three commonly used proxies of competition, namely market concentration (measured as the Herfindahl–Hirschman Index), the four-pledgee concentration ratio, and the total number of pledgees. Both lines exhibit a noticeable upward trend, especially after the removal of the entry barrier for securities companies to the share pledging market through the Guidelines in 2013.

## 2.2. Hypothesis development

Pressure from new and existing rivals may diminish a pledgee's ability to earn profits. Pledgees are likely to respond to increased pressure by making strategic operating decisions. To maintain good relationships with their existing clients, pledgees may lower monitoring requirements to reduce the default risk of the pledge firms in an effort to undercut their competitors and maintain their market share. Bushman et al. (2016) find that banks respond to increased competitive pressure by altering their lending practices, such as by reducing the number of covenants in loan contracts.

As readable and clear narrative information is an important input into lenders' lending and monitoring practices (Ertugrul et al., 2017), the negative impact of higher competition may result in pledgees being less likely to require clear narrative information to learn about the pledge firms. Meanwhile, a positive tone in the annual report helps increase share price and keep the value of collateral above the maintenance requirement, thus reducing the default risk and the likelihood of shares being liquidated to recover the loss. As a result, higher competition is negatively related to the ex-post monitoring of pledgees, thus inducing pledge firms to use tone management.<sup>3</sup> Thus, we derive the following hypothesis:

**H1.** Pledge firms engage in more annual report tone management when pledgee competition is higher.

The negative impact of the Guidelines on pledgees' monitoring incentives may be more pronounced for clients with higher default risk. Given that the low credit quality of pledge firms increases the risk of default and the risk of pledgees' loan portfolios, pledgees may further reduce monitoring to avoid the default of those clients. Such actions may lead to more tone management by pledge firms with the goal of maintaining collateral value above the maintenance requirement. Based on the above discussions, we derive the following hypothesis:

**H1.1.** The effect of pledgee competition on pledge firms' annual report tone management is more pronounced for pledge firms with lower credit quality.

In addition, the controlling shareholders of non-SOEs are more vulnerable to default risk than SOEs for two reasons. First, in the case of default, pledgees may be forced to liquidate the pledged shares to recover the loss. However, it may be difficult to liquidate SOEs' shares due to legal restrictions and government interference (Xie et al., 2016). Second, in the case of default, pledgees may ask the pledge firms to deposit extra funds to meet the maintenance requirement, rather than liquidate the pledged shares. However, it is more difficult for the shareholders of non-SOEs to obtain external funds, as they are discriminated against in both equity financing and loan financing (e.g., Aharony et al., 2000; Brandt and Li, 2003; Wang et al., 2008). Therefore, for non-SOE pledge firms, pledgees may exert fewer monitoring efforts to reduce their default risk, inducing the controlling shareholders of non-SOEs to engage in more tone management. Therefore, we hypothesize the following:

**H1.2.** The effect of pledgee competition on pledge firms' annual report tone management is more pronounced for non-SOEs.

<sup>3</sup> We consider the example of Jiangxi Lianchuang Electronics Company Limited (600363.SH) (JLE). The controlling shareholders of JLE pledged their shares in 2012, 2013, and 2014. This firm demonstrated similar performance from 2012 to 2014, with its return on assets remaining at 6%. However, after the 2013 Guidelines, the firm used more positive words (approximately eight) to describe its operations in the Management's Discussion and Analysis (MD&A) section of its 2013 annual report (we consider the first paragraph) than in its 2012 annual report (only one word). The firm also used more positive words (approximately seven) to describe its operations in the MD&A section of its 2014 report than in its 2012 annual report.

The negative impact of competition may also increase pledge firms' stock price crash risk. As discussed above, pledgees respond to higher competition by lowering their monitoring incentives, leading to pledge firms obscuring adverse news by using positive language in their annual reports. Overall, an overly positive tone results from pledge firms' incentive to conceal bad news or release biased good news. However, the amount of bad information that a company can hide from the market is limited. Once the firm releases the accumulated bad news to the market with a significant amount of information, rational investors immediately revise their original expectation down to a new expectation and this sharp reduction in expected earnings leads to a rapid decrease in the stock price (e.g., Jin and Myers, 2006; Piotroski et al., 2015; Kim et al., 2016). As a result, a stock price crash occurs. For example, Ertugrul et al. (2017) highlight that firms with a higher proportion of uncertain and weak modal words in 10-Ks have stricter loan contract terms and greater future stock price crash risk. Zhou et al. (2018) also show that a more optimistic tone leads to higher future stock price crash risk, especially when the truthfulness of the tone is lower. Therefore, we hypothesize the following:

**H2.** Pledge firms' future stock price crash risk increases when pledgee competition is higher.

### 3. Research design

#### 3.1. Sample and data sources

Our sample covers all nonfinancial firms traded on China's A-share market from 2003 to 2016. We require pledge firms (treatment sample) to have controlling shareholders pledging their shares, as controlling shareholders hold highly concentrated ownership of Chinese listed firms (Liu and Lu, 2007; Jiang et al., 2010) and are capable of influencing the firms' decisions, including disclosure choice. We hand collect information on whether shareholders with share pledges are controlling shareholders based on the pledge data from the WIND database.<sup>4</sup> For each firm-year, we obtain the annual report through the homepage of the CNINF,<sup>5</sup> where all listed firms are required to file registration statements, periodic reports, and other forms electronically, and functions as the U.S. EDGAR system. We use PERL to extract the Management's Discussion and Analysis (MD&A) section from the annual reports. Following Li (2008) and Loughran and McDonald (2011), we exclude the annual reports with a total number of words in the MD&A section less than 1% of the sample distribution. Firms with missing financial information or negative book equity values are also excluded. The final sample consists of 2710 unique firms and 20,998 firm-year observations, including 5439 pledge firm-year observations (treatment sample) and 15,559 non-pledge firm-year observations (control sample).

Panel A of Table 2 summarizes the distribution of the sample firms by year. The number of pledge firms in the Chinese capital market increased from 25 in 2003 to 1104 in 2016. This is consistent with share pledges being more extensively used over time. The percentage of the market represented by pledge firms, in terms of observation numbers, increased from 3% in 2003 to 47% in 2016. Panel B shows that pledge firms are mainly in the industries of information technology, real estate, and public facilities and other services.

#### 3.2. Pledgee competition and pledgee firms' tone management (H1)

To investigate the influence of pledgee competition over pledge firms' tone management, we use the following difference-in-differences design in the empirical investigation:

$$\begin{aligned} \text{Tone}_{i,t}(\text{AbTone}_{i,t}) = & \alpha_0 + \alpha_1 \text{Pledge}_{i,t} + \alpha_2 \text{Post}_t + \alpha_3 \text{Pledge}_{i,t} * \text{Post}_t + \alpha_4 \text{OWN}_{i,t} + \alpha_5 \text{SOE}_{i,t} + \alpha_6 \text{Size}_{i,t} \\ & + \alpha_7 \text{MB}_{i,t} + \alpha_8 \text{LEV}_{i,t} + \alpha_9 \text{ROA}_{i,t} + \alpha_{10} \text{Industry} + \alpha_{11} \text{Province} + \varepsilon \end{aligned} \quad (1)$$

<sup>4</sup> The WIND database collects data from the interim reports of listed firms and reports data on pledged and frozen shares separately. Therefore, we can identify the pledging activities of Chinese listed firms directly.

<sup>5</sup> <http://www.cninfo.com.cn> (in Chinese).

Table 2  
Sample distribution.

Panel A: Sample distribution by year			
Year	Total	No. of pledge firm-year observations	No. of non-pledge firm-year observations
2003	853	25	828
2004	952	87	865
2005	1038	168	870
2006	996	163	833
2007	1032	158	874
2008	1169	211	958
2009	1281	258	1023
2010	1363	255	1108
2011	1719	378	1341
2012	2015	469	1546
2013	2162	627	1535
2014	2049	691	1358
2015	2034	845	1189
2016	2335	1104	1231
Total	20,998	5439	15,559
Panel B: Sample distribution by industry			
Industry	Total	No. of pledge firm-year observations	No. of non-pledge firm-year observations
Farming, forestry, animal husbandry, and fishing	326	89	237
Mining	612	142	470
Manufacturing	11,865	3277	8588
Utilities	1020	138	882
Construction	576	154	422
Transportation and warehousing	796	49	747
Information technology	1678	541	1137
Wholesale and retail trades	1475	286	1189
Real estate	1254	400	854
Public facilities and other services	802	233	569
Communication and cultural industries	333	82	251
Conglomerates	261	48	213
Total	20,998	5439	15,559

This table reports the distribution of pledge firm-year observations. Panels A and B report the distribution by year and industry, respectively.

We follow Huang et al. (2014) and measure annual report tone management using two measures. The first measure is the firm's tone ( $Tone_{i,t}$ ) in the MD&A section of the annual report.<sup>6</sup> We use the word list of the Taiwan University NTUSD Vocabulary for Sentiment Analysis to classify the frequency of optimistic versus pessimistic words appearing in the MD&A section. Furthermore, we define  $Tone_t$  as the frequency difference between positive and negative words scaled by the total number of positive and negative words in the MD&A section. The second measure is the discretionary component of tone ( $AbTone_{i,t}$ ) estimated using the following cross-sectional regression:<sup>7</sup>

<sup>6</sup> Following Feldman et al. (2010), Li (2010), and Muslu et al. (2014), we choose the MD&A section, as it is arguably the most widely read and most important component of the financial section (Tavcar, 1998). Furthermore, sell-side financial analysts most frequently rely on the MD&A section when preparing their reports (Knutson, 1993; Rogers and Grant, 1997).

<sup>7</sup> In this model, we exclude two variables: the number of business segments ( $BUSSEG$ ) and geographic segments ( $GEOSEG$ ). Specifically, information about business segments and geographic segments is not available in China.



$$\begin{aligned} Tone_{i,t} = & \beta_0 + \beta_1 * ROA_{i,t} + \beta_2 * RET_{i,t} + \beta_3 * Size_{i,t} + \beta_4 * BM_{i,t} + \beta_5 * STD\_RET_{i,t} + \beta_6 * STD\_ROA_{i,t} \\ & + \beta_7 * AGE_{i,t} + \beta_8 * LOSS_{i,t} + \beta_9 * \Delta ROA_{i,t} + \varepsilon \end{aligned} \quad (2)$$

where  $ROA_{i,t}$  is the return on assets;  $RET_{i,t}$  is the contemporaneous annual stock return;  $Size_{i,t}$  is the logarithm of market capitalization;  $BM_{i,t}$  is the book-to-market ratio;  $STD\_RET_{i,t}$  is the standard deviation of monthly stock returns over the year;  $STD\_ROA_{i,t}$  is the standard deviation of the quarterly return on assets over the year, with at least three observations;  $AGE_{i,t}$  is the logarithm of 1 plus the number of years since the listing of firm  $i$ ;  $LOSS_{i,t}$  is an indicator that equals 1 when  $ROA_{i,t}$  is negative and 0 otherwise; and  $\Delta ROA_{i,t}$  is the change in the return on assets. Discretionary tone ( $AbTone_{i,t}$ ) is the residual of Eq. (2). A higher  $Tone_{i,t}$  or  $AbTone_{i,t}$  indicates greater annual report tone management.

We set the indicator variable  $Pledge$  to 1 for the pledge firm-year observations and to 0 otherwise.  $Post$  is an indicator that equals 1 after the enforcement of the Guidelines in 2013 and 0 otherwise.

Following the literature (e.g., Huang et al., 2014), we include control variables that affect annual report tone management: the ownership held by the controlling shareholder ( $OWN_t$ ); an SOE indicator variable ( $SOE_t$ ); the market-to-book ratio ( $MB_t$ ); the leverage ratio ( $LEV_t$ ), defined as total debt over total assets; the return on assets ( $ROA_t$ ); and the logarithm of firm size ( $Size_t$ ).

### 3.3. Pledgee competition and pledgee firms' future crash risk (H2)

To investigate the influence of pledgee competition over pledge firms' stock price crash risk, we use the following regression design in the empirical investigation:

$$\begin{aligned} NCSKEW_{t+1}(DUVOL_{t+1}) = & \alpha_0 + \alpha_1 Pledge_{i,t} + \alpha_2 Post_t + \alpha_3 Pledge_{i,t} * Post_t + \alpha_4 NCSKEW_{i,t} \\ & + \alpha_5 DTURN_{i,t} + \alpha_6 RET_{i,t} + \alpha_7 SIGMA_{i,t} + \alpha_8 OWN_{i,t} + \alpha_9 SOE_{i,t} + \alpha_{10} Size_{i,t} \\ & + \alpha_{11} MB_{i,t} + \alpha_{12} LEV_{i,t} + \alpha_{13} ROA_{i,t} + \alpha_{14} ABSDA_{i,t} + \alpha_{15} Industry \\ & + \alpha_{16} Province + \varepsilon \end{aligned} \quad (3)$$

To better identify the source of the impact of pledgee competition on pledgee firms' future crash risk, we test whether this increase varies predictably with the annual report tone of pledge firms. We estimate the following model:

$$\begin{aligned} NCSKEW_{t+1}(DUVOL_{t+1}) = & \alpha_0 + \alpha_1 Pledge_{i,t} + \alpha_2 Post_t + \alpha_3 HIGHTone_{i,t} + \alpha_4 Pledge_{i,t} * Post_t \\ & + \alpha_5 Pledge_{i,t} * HIGHTone_{i,t} + \alpha_6 Post_t * HIGHTone_{i,t} + \alpha_7 Pledge_{i,t} * Post_t \\ & * HIGHTone_{i,t} + \alpha_8 NCSKEW_{i,t} + \alpha_9 DTURN_{i,t} + \alpha_{10} RET_{i,t} + \alpha_{11} SIGMA_{i,t} \\ & + \alpha_{12} OWN_{i,t} + \alpha_{13} SOE_{i,t} + \alpha_{14} Size_{i,t} + \alpha_{15} MB_{i,t} + \alpha_{16} LEV_{i,t} + \alpha_{17} ROA_{i,t} \\ & + \alpha_{18} ABSDA_{i,t} + \alpha_{19} Industry + \alpha_{20} Province + \varepsilon \end{aligned} \quad (4)$$

Specifically, the annual report tone of pledged firms ( $HIGHTone$ ) is defined, in turn, as  $High\_Tone$  or  $High\_AbTone$ .  $High\_Tone$  ( $High\_AbTone$ ) is an indicator variable that equals 1 if the firm's annual report tone ( $AbTone$ ) is in the top quintile of the industry distribution in year  $t$ .

Following past studies (e.g., Jin and Myers, 2006; Kim et al., 2016), we use two measures of stock price crash risk: (i) the negative coefficient of skewness of firm-specific daily returns ( $NCSKEW$ ) and (ii) the down-to-up volatility of firm-specific daily returns ( $DUVOL$ ). We exclude firm-years with less than 120 daily observations.

To calculate the stock price crash risk, we first estimate the firm-specific daily returns for each firm in each year using the market model of Gul et al. (2010):

$$r_{j,\tau} = \alpha + \beta_1 Market_{\tau} + \beta_2 Market_{\tau-1} + \beta_3 Industry_{m,\tau} + \beta_4 Industry_{m,\tau-1} + \varepsilon_{j,\tau} \quad (5)$$

where  $r_{j,\tau}$  is the return on stock  $j$  on day  $\tau$ ,  $Market_{\tau}$  is the value-weighted market return for China's A-share market on day  $\tau$ , and  $Industry_{m,\tau}$  is the value-weighted return for industry  $m$  on day  $\tau$ .

The negative coefficient of skewness ( $NCSKEW$ ) is computed as follows:

$$NCSKEW_{j,t} = \frac{-(n(n-1)^{\frac{2}{3}} \sum R_{j,\tau}^3)}{((n-1)(n-2)(\sum R_{j,\tau}^2)^{\frac{3}{2}})} \quad (6)$$

where the firm-specific daily return,  $R_{j,\tau}$ , is the natural log of 1 plus the residual return from Eq. (5) and  $n$  is the number of  $R_{j,\tau}$  in year  $t$ . A minus sign is added so that an increase in  $NCSKEW$  corresponds to a stock being more “crash prone.”

In constructing the down-to-up volatility ( $DUVOL$ ), we first label days with  $R_{j,\tau}$  above (below) the mean of the year as “up” (“down”) days. Then, for each stock  $j$  over year  $t$ , we divide the standard deviation of  $R_{j,\tau}$  during the down days by the standard deviation of  $R_{j,\tau}$  during the up days:

$$DUVOL_{j,t} = \log \left\{ \frac{(n_u - 1) \sum_{\text{DOWN}} R_{j,\tau}^2}{(n_d - 1) \sum_{\text{UP}} R_{j,\tau}^2} \right\} \quad (7)$$

where  $n_u$  and  $n_d$  are the number of up and down days in year  $t$ , respectively. Similar to  $NCSKEW$ , a higher value of  $DUVOL$  suggests that the stock has a higher crash risk. Therefore, a higher  $\alpha_3$  in Eq. (3) indicates the positive relationship between pledgee competition and pledge firms’ crash risk.

Following the literature (e.g., Hutton et al., 2009; Kim et al., 2016), we control variables that affect the crash risk: the change in monthly share turnover ( $DTURN_t$ ), defined as the average monthly share turnover in fiscal year  $t$  minus that in year  $t-1$ ; <sup>8</sup>the lagged negative coefficient of skewness for firm-specific daily returns ( $NCSKEW_t$ ); the lagged standard deviation and average of firm-specific daily returns during the year, or  $SIGMA_t$  and  $RET_t$ ; the financial reporting quality measure ( $ABSDA$ ), defined as the absolute value of the modified Jones (1991) discretionary accruals; and the control variables in Model (1). We also winsorize all of the continuous variables at the top and bottom 1% levels. All of the accounting data and return data are obtained from the CSMAR database. Both province- and industry-fixed effects are also controlled.

## 4. Empirical results

### 4.1. Impact of pledgee competition on pledge firms’ annual report tone management

We expect higher competition to pressure pledgees to lower their monitoring incentives, leading to pledge firms engaging in more annual report tone management. In this section, we examine the impact of pledge competition on pledge firms’ annual report tone management.

In Table 3, we split the sample into subsamples based on the enforcement of the Guidelines, or *Post*. For pledge firms, the difference in *Tone* and *AbTone* from the pre- to post-Guideline period is  $-0.024$  and  $0.005$ , respectively. Both are higher than that of the non-pledge firms and the difference-in-differences in *Tone* and *AbTone* are significantly positive at the 5% level. This evidence supports our hypothesis that pledgee competition increases pledge firms’ annual report tone management, which may result from pledgees responding to a competitive environment.

We further estimate the regression in Eq. (1) to examine the relationship between pledge competition and pledge firms’ annual report tone management, relative to that of the control group. The results are reported in Table 4. The coefficient on our variable of interest, *Pledge* \* *Post*, is significantly positive in both columns 1 and 2 ( $t = 3.18$  and  $2.50$ , respectively). This suggests that the relationship between pledge competition and pledge firms’ annual report tone management for pledge firms is significantly greater than that for non-pledge firms. It is worth noting that the coefficients on *Pledge* are significantly positive in Table 4. Such evidence is consistent with the findings of Xie et al. (2016, 2017) that pledge firms have lower financial report quality than non-pledge firms.

Overall, the results reported in Tables 3 and 4 reveal that the presence of higher pledgee competition is significantly positively associated with pledge firms’ annual report tone management, which is consistent with the argument that the monitoring effect of pledgees weakens as pledgee competition increases.

<sup>8</sup> The monthly share turnover is calculated as the total value of tradable shares traded scaled by the total value of tradable shares over the month.

Table 3  
Summary statistics.

Pledge firms	Pre-Guidelines ( <i>Post</i> = 0) Mean	Post-Guidelines ( <i>Post</i> = 1) Mean	Difference in mean (1)	Diff-in-Diff (1)–(2)
<i>Tone<sub>t</sub></i> ( <i>t</i> -value)	0.633	0.609	−0.024 −9.42***	0.015 4.71***
<i>AbTone<sub>t</sub></i> ( <i>t</i> -value)	0.007	0.012	0.005 2.17**	0.006 2.24**
Obs.	2172	3267		
Non-pledge firms	Mean	Mean	(2)	
<i>Tone<sub>t</sub></i> ( <i>t</i> -value)	0.629	0.590	−0.039 24.01***	
<i>AbTone<sub>t</sub></i> ( <i>t</i> -value)	0.000	−0.001	−0.001 −0.82	
Obs.	10,246	5313		

This table reports the summary statistics of annual report tone management from 2003 to 2016. We split the sample into two subsamples based on the enforcement of the Guidelines. \*, \*\*, and \*\*\* represent a statistically significant difference at the 10%, 5%, and 1% levels, respectively.

Table 4  
Influence of pledge competition on pledge firms' annual report tone management.

	(1) <i>Tone<sub>t</sub></i>	(2) <i>AbTone<sub>t</sub></i>
<i>Intercept</i>	0.570*** (46.97)	0.034*** (2.94)
<i>Pledge<sub>t</sub></i>	0.006*** (3.11)	0.009*** (4.56)
<i>Post<sub>t</sub></i>	−0.040*** (−23.49)	0.002 (1.16)
<i>Pledge<sub>t</sub> * Post<sub>t</sub></i>	0.009*** (3.18)	0.007** (2.50)
<i>OWN<sub>t</sub></i>	−0.000*** (−5.03)	−0.000*** (−7.85)
<i>SOE<sub>t</sub></i>	0.001 (0.39)	0.004*** (2.82)
<i>Size<sub>t</sub></i>	0.001* (1.66)	−0.003*** (−4.08)
<i>MB<sub>t</sub></i>	0.000* (1.85)	−0.000 (−1.56)
<i>LEV<sub>t</sub></i>	0.020*** (5.10)	0.027*** (7.34)
<i>ROA<sub>t</sub></i>	0.465*** (35.94)	0.045*** (3.67)
<i>Province &amp; Industry</i>	YES	YES
<i>N</i>	20,998	20,998
adj. <i>R</i> <sup>2</sup>	0.166	0.024

This table examines the influence of pledge competition on pledge firms' annual report tone management. The *t*-statistics, computed with robust standard errors, are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

#### 4.2. Cross-Sectional analyses of the impact of pledgee competition on pledge firms' annual report tone management

Section 4.1 provides evidence that pledgee competition contributes to the higher annual report tone management of pledge firms, which may result from the fact that competition lowers pledgees' ex-post monitoring.

We further argue that the influence of pledgee competition may not be constant across firms. It may be conditional on (i) pledge firms’ credit quality and (ii) whether pledge firms are non-SOEs. Accordingly, we examine this cross-sectional variation in this section.

4.2.1. Pledge firms’ credit quality

As discussed in Section 1, if the positive relationship between the pledgee competition on pledge firms’ annual report tone management indeed results from pledgees lowering their monitoring incentives, such a positive relationship should be more (less) evident when pledge firms’ credit quality is lower (higher). Following Bushman et al. (2016), we use firms’ Z-score, derived from the Altman (1968) model, to measure credit quality. Accordingly, we partition our sample firms based on credit quality and estimate the baseline model specified in Eq. (1) in each subsample. The results are reported in Panel A of Table 5.

Panel A presents the results of the subsample tests based on credit quality. In columns 1 and 2, where firms with low credit quality are examined, the coefficients on the interaction term *Pledge* \* *Post* are both significantly positive at the 5% level ( $t = 2.88$  and  $2.20$ , respectively). In columns 3 and 4, where firms with high credit quality are examined, the coefficients on *Pledge* \* *Post* are indistinguishable from zero.

Table 5  
Cross-sectional analyses.

Panel A: Pledge firms’ credit quality				
	Low credit quality		High credit quality	
	(1)	(2)	(3)	(4)
	<i>Tone<sub>t</sub></i>	<i>AbTone<sub>t</sub></i>	<i>Tone<sub>t</sub></i>	<i>AbTone<sub>t</sub></i>
<i>Intercept</i>	0.597*** (35.98)	0.065*** (4.08)	0.532*** (28.26)	0.000 (0.03)
<i>Pledge<sub>t</sub></i>	0.007** (2.52)	0.009*** (3.35)	0.006** (1.96)	0.009*** (3.03)
<i>Post<sub>t</sub></i>	-0.045*** (-18.82)	-0.003 (-1.14)	-0.036*** (-14.85)	0.006** (2.39)
<i>Pledge<sub>t</sub> * Post<sub>t</sub></i>	0.012*** (2.88)	0.009** (2.20)	0.005 (1.11)	0.004 (1.07)
<i>Control variables in Table 4</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	10,485	10,485	10,513	10,513
adj. <i>R</i> <sup>2</sup>	0.201	0.040	0.138	0.020
Panel B: Non-SOE pledge firms				
	Non-SOEs		SOEs	
	(1)	(2)	(3)	(4)
	<i>Tone<sub>t</sub></i>	<i>AbTone<sub>t</sub></i>	<i>Tone<sub>t</sub></i>	<i>AbTone<sub>t</sub></i>
<i>Intercept</i>	0.498*** (28.96)	-0.051*** (-3.03)	0.605*** (37.47)	0.084*** (5.40)
<i>Pledge<sub>t</sub></i>	0.008*** (3.42)	0.010*** (4.26)	0.008** (2.33)	0.011*** (3.17)
<i>Post<sub>t</sub></i>	-0.032*** (-13.77)	0.004* (1.94)	-0.045*** (-20.09)	-0.000 (-0.09)
<i>Pledge<sub>t</sub> * Post<sub>t</sub></i>	0.007** (1.99)	0.007** (2.15)	-0.010 (-1.64)	-0.010* (-1.67)
<i>Control variables in Table 4</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	10,075	10,075	10,923	10,923
adj. <i>R</i> <sup>2</sup>	0.168	0.040	0.209	0.048

This table examines the cross-sectional variation in the influence of pledgee competition over pledge firms’ annual report tone management. In Panel A, the conditioning variable is credit quality and the low and high groups are partitioned based on the median. In Panel B, the conditioning variable is whether firms are SOEs. The control variable coefficients are suppressed for brevity. The *t*-statistics, computed with robust standard errors, are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

In sum, the above evidence suggests that pledgees operating in a more competitive environment may lower ex-post monitoring for firms with low credit quality, thus resulting in more annual report tone management for those firms. This further supports our argument that competition changes pledgees' monitoring practices.

#### 4.2.2. Non-state-owned enterprise pledge firms

We further examine whether the influence of pledgee competition on pledge firms' annual report tone management is stronger for non-SOEs. As discussed in Section 1, we expect non-SOE pledge firms to be more vulnerable to losing control rights and to thus engage in more tone management when competition induces pledgees to lower their monitoring incentives. Accordingly, we partition our sample firms based on whether they are SOEs and estimate Eq. (1) in each subsample. The results are reported in Panel B of Table 5.

Panel B presents the results of the subsample tests based on whether firms are SOEs. In columns 1 and 2, where non-SOEs are examined, the coefficients on the interaction term *Pledge* \* *Post* are both significantly positive at the 5% level ( $t = 1.99$  and  $2.15$ , respectively). In columns 3 and 4, where SOEs are examined, the coefficients on *Pledge* \* *Post* are negative.

The above evidence suggests that for non-SOEs, which are more vulnerable to losing control rights, pledgees operating in a more competitive environment may reduce the monitoring of those firms to reduce default risk.

#### 4.3. Impact of pledgee competition on pledge firms' stock price crash risk

In Section 4.1, we document that pledgee competition affects pledgees' lending practices by examining pledge firms' annual report tone management. In this section, we investigate whether pledgee competition increases the stock price crash risk of pledge firms and further identify the source of the impact of pledgee competition on future crash risk.

The results are reported in Table 6. Panel A of Table 6 reports the results of Eq. (3). The coefficients on *Pledge* \* *Post* are significantly positive in both columns 1 and 2 ( $t = 4.38$  and  $5.19$ , respectively), suggesting that the relationship between pledge competition and pledge firms' future crash risk is significantly greater than that for non-pledge firms. Notably, the coefficient on *Pledge* is significantly negative in Panel A. This suggests that the average crash risk of the treatment group is lower than that of the control group, which is consistent with the findings of Xie et al. (2016) that pledge firms obscure the information environment to

Table 6  
Influence of pledge competition on pledge firms' stock price crash risk.

	(1) <i>NCSKEW</i> <sub><i>t</i>+1</sub>		(2) <i>DUVOL</i> <sub><i>t</i>+1</sub>	
<i>Intercept</i>	-0.904***	(-9.67)	-0.639***	(-13.18)
<i>Pledge</i> <sub><i>t</i></sub>	-0.043***	(-3.07)	-0.033***	(-4.46)
<i>Post</i> <sub><i>t</i></sub>	-0.136***	(-11.79)	-0.104***	(-17.47)
<i>Pledge</i> <sub><i>t</i></sub> * <i>Post</i> <sub><i>t</i></sub>	0.087***	(4.38)	0.054***	(5.19)
<i>NCSKEW</i> <sub><i>t</i></sub>	0.054***	(8.38)	0.037***	(11.19)
<i>DTURN</i> <sub><i>t</i></sub>	-0.030***	(-2.98)	-0.041***	(-7.94)
<i>RET</i> <sub><i>t</i></sub>	134.849***	(5.71)	5.213	(0.44)
<i>SIGMA</i> <sub><i>t</i></sub>	7.112***	(5.56)	-0.836	(-1.32)
<i>OWN</i> <sub><i>t</i></sub>	-0.000	(-0.69)	-0.000	(-1.52)
<i>SOE</i> <sub><i>t</i></sub>	-0.045***	(-4.12)	-0.017***	(-3.08)
<i>Size</i> <sub><i>t</i></sub>	0.011**	(1.99)	0.017***	(6.22)
<i>MB</i> <sub><i>t</i></sub>	0.022***	(11.60)	0.015***	(14.54)
<i>LEV</i> <sub><i>t</i></sub>	-0.020	(-0.75)	-0.050***	(-3.64)
<i>ROA</i> <sub><i>t</i></sub>	0.580***	(6.73)	0.169***	(3.74)
<i>ABSDA</i> <sub><i>t</i></sub>	0.123**	(2.15)	0.102***	(3.49)
<i>Province &amp; Industry</i>		YES		YES
<i>N</i>		20,998		20,998
adj. <i>R</i> <sup>2</sup>		0.039		0.059

(continued on next page)

Table 6 (continued)

	(1)	(2)	(3)	(4)
	$NCSKEW_{t+1}$	$DUVOL_{t+1}$	$NCSKEW_{t+1}$	$DUVOL_{t+1}$
<i>Intercept</i>	-0.984*** (-10.54)	-0.689*** (-14.28)	-0.978*** (-10.48)	-0.686*** (-14.21)
<i>Pledge<sub>t</sub></i>	-0.035** (-2.32)	-0.027*** (-3.37)	-0.037** (-2.46)	-0.028*** (-3.50)
<i>Post<sub>t</sub></i>	-0.134*** (-10.78)	-0.104*** (-16.34)	-0.136*** (-10.95)	-0.106*** (-16.54)
<i>Pledge<sub>t</sub> * Post<sub>t</sub></i>	0.070*** (3.25)	0.044*** (3.98)	0.068*** (3.18)	0.044*** (3.93)
<i>High_Tone<sub>t</sub></i>	0.000 (0.01)	0.005 (0.56)		
<i>Pledge<sub>t</sub> * High_Tone<sub>t</sub></i>	-0.061* (-1.70)	-0.048** (-2.43)		
<i>Post<sub>t</sub> * High_Tone<sub>t</sub></i>	-0.011 (-0.36)	0.001 (0.09)		
<i>Pledge<sub>t</sub> * Post<sub>t</sub> * High_Tone<sub>t</sub></i>	0.127** (2.26)	0.069** (2.37)		
<i>High_AbTone<sub>t</sub></i>			-0.015 (-0.85)	-0.002 (-0.28)
<i>Pledge<sub>t</sub> * High_AbTone<sub>t</sub></i>			-0.045 (-1.24)	-0.040** (-2.02)
<i>Post<sub>t</sub> * High_AbTone<sub>t</sub></i>			0.001 (0.03)	0.009 (0.59)
<i>Pledge<sub>t</sub> * Post<sub>t</sub> * High_AbTone<sub>t</sub></i>			0.139** (2.46)	0.074** (2.51)
<i>NCSKEW<sub>t</sub></i>	0.054*** (8.39)	0.037*** (11.21)	0.054*** (8.39)	0.037*** (11.22)
<i>DTURN<sub>t</sub></i>	-0.030*** (-2.96)	-0.041*** (-7.94)	-0.030*** (-2.96)	-0.041*** (-7.92)
<i>RET<sub>t</sub></i>	134.616*** (5.70)	4.956 (0.42)	134.153*** (5.68)	4.694 (0.40)
<i>SIGMA<sub>t</sub></i>	7.099*** (5.55)	-0.848 (-1.34)	7.075*** (5.53)	-0.861 (-1.36)
<i>OWN<sub>t</sub></i>	-0.000 (-0.68)	-0.000 (-1.51)	-0.000 (-0.71)	-0.000 (-1.53)
<i>SOE<sub>t</sub></i>	-0.044*** (-4.09)	-0.018*** (-3.11)	-0.044*** (-4.03)	-0.017*** (-3.06)
<i>Size<sub>t</sub></i>	0.011** (1.98)	0.017*** (6.25)	0.011* (1.95)	0.017*** (6.21)
<i>MB<sub>t</sub></i>	0.022*** (11.60)	0.015*** (14.50)	0.022*** (11.64)	0.015*** (14.55)
<i>LEV<sub>t</sub></i>	-0.020 (-0.76)	-0.050*** (-3.66)	-0.020 (-0.76)	-0.050*** (-3.66)
<i>ROA<sub>t</sub></i>	0.580*** (6.73)	0.167*** (3.69)	0.581*** (6.75)	0.169*** (3.75)
<i>ABSDA<sub>t</sub></i>	0.123** (2.15)	0.102*** (3.48)	0.123** (2.16)	0.102*** (3.48)
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	20,998	20,998	20,998	20,998
<i>adj. R<sup>2</sup></i>	0.039	0.059	0.039	0.059

This table examines the influence of pledge competition on pledge firms' stock price crash risk. Panels A and B report the results of Models (3) and (4), respectively. The *t*-statistics, computed with robust standard errors, are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

reduce crash risk. This evidence helps alleviate concerns over the endogeneity problem that pledgees in a competitive environment may extend loans to firms with higher crash risk in the first place.

Panel B of Table 6 reports the results of Eq. (4). In columns 1 and 2 of Panel B, we show that  $Pledge * Post * High\_Tone$  is positively significant at the 5% level ( $t = 2.26$  and  $2.37$ , respectively). This result suggests that pledge competition increases pledge firms' future crash risk in firms with more positive annual report tone. Furthermore, columns 3 and 4 of Panel B show that  $Pledge * Post * High\_AbTone$  is positively significant at the 5% level ( $t = 2.46$  and  $2.51$ , respectively). This supports our argument that pledge competition leads to pledge firms obscuring adverse news through positive language in their annual reports and that such actions result in stock price crash.

In sum, the results reported in Table 6 reveal that pledge competition is significantly positively associated with pledge firms' stock price crash risk and that this relationship increases with the annual report tone of pledge firms. Such evidence corroborates the argument that pledgees lower ex-post monitoring in response to competition.

## 5. Additional analyses

### 5.1. Alternative explanations

Our analysis shows that pledge competition is positively associated with pledge firms' annual report tone management and future crash risk. We argue that the competition requires pledgees to develop new business. Furthermore, with limited resources, pledgees cannot spend much time monitoring their existing business, which results in pledge firms' greater opportunistic behavior to support stock prices.

However, two alternative explanations for our results exist. The first alternative explanation is that increased competition forces pledgees to lower their screening standards. This means that poor-quality pledge firms are able to pledge and obtain loans. Therefore, it is endogenous that pledge firms experience greater tone management and greater crash risk. Under this condition, we predict that the sensitivity of tone management and crash risk to the pledged amount increased from the pre- to post-regime. The second alternative explanation is that borrowing against pledging becomes easier due to the competition and that managers have greater incentive to hide bad news to support stock prices due to a greater amount of pledging. Following this reasoning, we predict that the sensitivity of tone management/crash risk to the pledged amount remains the same after the Guidelines.

To rule out the above alternative explanations, we investigate whether the sensitivity of tone management/crash risk to the pledged amount changes after the Guidelines. Based on our conjecture, if pledgees cannot spend much time monitoring their business and lower their ex-post monitoring, then pledge firms can enjoy the slack, which leads to a decreased sensitivity of tone management/crash risk to the pledged amount after the Guidelines. We use the following model to investigate the change:

$$\begin{aligned} Tone_{i,t}(AbTone_{i,t}, NCSKEW_{t+1}, DUVOL_{t+1}) = & \alpha_0 + \alpha_1 VPledge_{i,t}(RPledge_{i,t}) + \alpha_2 Post_t \\ & + \alpha_3 VPledge_{i,t}(RPledge_{i,t}) * Post_t + Control + \varepsilon \end{aligned} \quad (8)$$

where we measure the pledged amount of pledge firms using two proxies: (i) the logarithm of 1 plus the total market capitalization of pledged shares by the controlling shareholders in year  $t$  ( $VPledge$ ) and (ii) how many times the controlling shareholders pledge their shares in year  $t$  ( $NPledge$ ).

Table 7 reports the results. The significantly negative coefficients on  $VPledge_i * Post$  across columns 1 and 2 and on  $NPledge * Post$  across columns 3 and 4 confirm that the sensitivity of tone management/crash risk to the pledged amount decreases after the Guidelines. These results are inconsistent with the two alternative explanations above.

### 5.2. Impact of guidelines on pledging activities

We assume that after the Guidelines, the quality of pledge firms remains the same, the contract terms remain the same, and only the ex-post monitoring of the pledgees changes, which results in pledge firms' greater opportunistic behavior to support stock prices. The underlying assumption is that pledgees have limited resources and competition requires them to develop new business. As such, they cannot spend much time

Table 7  
Ruling out alternative explanations.

Panel A: Change in the sensitivity of tone management to the pledged amount after the Guidelines				
	(1) <i>Tone<sub>t</sub></i>	(2) <i>AbTone<sub>t</sub></i>	(3) <i>Tone<sub>t</sub></i>	(4) <i>AbTone<sub>t</sub></i>
<i>Intercept</i>	0.128 (0.74)	0.182 (0.32)	0.466*** (11.19)	-0.324** (-2.34)
<i>Post<sub>t</sub></i>	-0.049* (-1.69)	0.138 (1.34)	-0.007 (-0.38)	0.123** (2.02)
<i>VPledge<sub>t</sub></i>	0.022* (1.74)	-0.056 (-1.27)		
<i>VPledge<sub>t</sub> * Post<sub>t</sub></i>	-0.002*** (-2.59)	-0.004* (-1.75)		
<i>NPledge<sub>t</sub></i>			-0.010 (-0.95)	-0.076** (-2.31)
<i>NPledge<sub>t</sub> * Post<sub>t</sub></i>			-0.003** (-2.15)	-0.006* (-1.81)
<i>Control variables in Table 4</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	5439	5439	5439	5439
<i>adj. R<sup>2</sup></i>	0.174	0.070	0.173	0.071
Panel B: Change in the sensitivity of crash risk to the pledged amount after the Guidelines				
	(1) <i>NCSKEW<sub>t+1</sub></i>	(2) <i>DUVOL<sub>t+1</sub></i>	(3) <i>NCSKEW<sub>t+1</sub></i>	(4) <i>DUVOL<sub>t+1</sub></i>
<i>Intercept</i>	0.806 (0.64)	1.763 (1.71)	0.431 (1.35)	0.269 (1.01)
<i>Post<sub>t</sub></i>	0.311 (1.47)	0.289* (2.14)	0.104 (0.80)	0.128** (2.36)
<i>VPledge<sub>t</sub></i>	-0.052 (-0.57)	-0.136* (-2.05)		
<i>VPledge<sub>t</sub> * Post<sub>t</sub></i>	-0.024*** (-3.56)	-0.006** (-2.27)		
<i>NPledge<sub>t</sub></i>			-0.087 (-1.23)	-0.103*** (-3.17)
<i>NPledge<sub>t</sub> * Post<sub>t</sub></i>			-0.021** (-2.47)	-0.006** (-2.29)
<i>Control variables in Table 6</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	5439	5439	5439	5439
<i>adj. R<sup>2</sup></i>	0.054	0.071	0.053	0.071

This table examines whether the sensitivity of tone management (Panel A) and crash risk (Panel B) to the pledged amount changed from the pre- to post-Guideline period. The control variable coefficients are suppressed for brevity. The *t*-statistics, computed with robust standard errors, are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

monitoring their existing business. For this assumption to be true, the first order effect is to examine whether the pledging activities of each pledger increase after the deregulation, which allows greater competition. Then we use the following model to investigate the change:

$$Value_t(Count_t) = \alpha_0 + \alpha_1 Post_t + Control + \varepsilon \quad (9)$$

where  $Value_t(Count_t)$  is the total pledging volume of each pledger in each year. Specifically,  $Value_t$  is the logarithm of 1 plus the total market capitalization and  $Count_t$  is the logarithm of 1 plus the frequency.  $Post$  is an indicator that equals 1 after the enforcement of the Guidelines in 2013 and 0 otherwise. The control variables include yearly investor sentiment measures: the number of investor accounts ( $NumofAccount_t$ ), the consumer consumption index ( $ConsumerConfidence_t$ ), the stock market turnover ratio ( $Turn_t$ ), and the loose monetary policy indicator ( $MPDummy_t$ ).  $MPDummy$  is an indicator that equals 1 if the currency circulation (M2) growth is higher than that of the GDP and 0 otherwise.



The results in Table 8 support our predictions. The significantly positive coefficients on  $Post_t$  in columns 1 and 2 ( $t = 17.25$  and  $15.95$ , respectively) suggest that the total pledging volume of each pledgee significantly increases after the Guidelines. This is consistent with our conjecture that the Guidelines lead to increased competition and that competition requires pledgees to develop new business.

### 5.3. Robustness checks

#### 5.3.1. Propensity-score matching and two-stage least squares

To further address the endogeneity issue, we use propensity-score matching (PSM) to select a firm whose controlling shareholder does not pledge shares (the control group) for each pledge firm (the treatment group). We require the control firm to (i) be in the same industry in the same year as the treatment firm and (ii) have the closest odds of pledging shares as the treatment firm. We estimate the odds of pledging shares using the following logistic regression model, where  $Pledge$  is the dependent variable. We also include the firm characteristics associated with the likelihood of pledging shares (Xie et al., 2016).

$$Pledge_t = \alpha_0 + \alpha_1 OWN_{t-1} + \alpha_2 SOE_{t-1} + \alpha_3 Size_{t-1} + \alpha_4 MB_{t-1} + \alpha_5 LEV_{t-1} + \alpha_6 ROA_{t-1} + \alpha_7 Year + \alpha_8 Industry + \varepsilon \quad (10)$$

This matching procedure yields 10,876 firm-year observations, of which 5438 are treatment firms and 5438 are control firms. We then re-estimate Eq. (1) and Eq. (3) based on the 10,876 firm-year observations. Columns 1 and 2 in Panel A and B of Table 9 present the results of Eq. (1) and Eq. (3), respectively.

Columns 1 and 2 in Panel A show that the coefficients on  $Pledge * Post$  remain significantly positive. This suggests that our findings that pledgee competition is significantly positively related to pledge firms' annual report tone management is unlikely to be driven by potential endogeneity. The results in columns 1 and 2 of Panel B are qualitatively similar to those in Table 6. This alleviates the concern about the endogeneity issue that pledgees in a competitive environment may tend to lend money to firms with high crash risk.

To address the endogeneity concern, we further examine whether our main findings are robust to the use of two-stage least squares (2SLS) regressions. We replace the variable  $Pledge$  in Eq. (1) and Eq. (3) with the predicted value ( $Pledge\_R$ ) of Eq. (10) and the interaction term  $Pledge\_R * Post$ . Columns 3 and 4 in Panel A and B of Table 9 present the results of Eq. (1) and Eq. (3), respectively. The results in columns 3 and 4 in Panels A and B are qualitatively similar to those in Tables 4 and 6, respectively. This alleviates the concern about the

Table 8  
Influence of the Guidelines on the pledging activities of each pledgee.

	(1) Value	(2) Count
<i>Intercept</i>	-11.758*** (-15.59)	-1.461*** (-14.18)
<i>Post<sub>t</sub></i>	1.914*** (17.25)	0.259*** (15.95)
<i>NumofAccount<sub>t</sub></i>	-0.001 (-0.62)	-0.000 (-0.28)
<i>ConsumerConfidence<sub>t</sub></i>	0.134*** (17.13)	0.017*** (15.61)
<i>Turn<sub>t</sub></i>	0.431 (0.88)	0.008 (0.12)
<i>MPDumy<sub>t</sub></i>	-0.418*** (-5.68)	-0.046*** (-4.82)
<i>N</i>	15,568	15,568
<i>adj. R<sup>2</sup></i>	0.109	0.092

This table examines whether the pledging activities of each pledgee increased from the pre- to post-Guideline period. The  $t$ -statistics, computed with robust standard errors, are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

Table 9  
Robustness checks (PSM and 2SLS).

Panel A: Influence of pledge competition on pledge firms' annual report tone management

	(1)	(2)	(3)	(4)
	PSM		2SLS regressions	
	$Tone_t$	$AbTone_t$	$Tone_t$	$AbTone_t$
<i>Intercept</i>	0.508*** (31.02)	-0.026* (-1.65)	0.584*** (47.79)	0.041*** (3.48)
<i>Pledge<sub>t</sub></i>	0.011*** (4.61)	0.011*** (4.96)		
<i>Post<sub>t</sub></i>	-0.038*** (-15.55)	0.002 (0.71)	-0.042*** (-17.49)	-0.003 (-1.43)
<i>Pledge<sub>t</sub> * Post<sub>t</sub></i>	0.008** (2.35)	0.007** (2.12)		
<i>Pledge_R<sub>t</sub></i>			-0.083*** (-9.30)	-0.029*** (-3.37)
<i>Pledge_R<sub>t</sub> * Post<sub>t</sub></i>			0.053*** (7.52)	0.037*** (5.55)
<i>Control variables in Table 4</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	10,876	10,876	20,998	20,998
<i>adj. R<sup>2</sup></i>	0.185	0.034	0.167	0.022

Panel B: Influence of pledge competition on pledge firms' stock price crash risk

	(1)	(2)	(3)	(4)
	PSM		2SLS regressions	
	$NCSKEW_{t+1}$	$DUVOL_{t+1}$	$NCSKEW_{t+1}$	$DUVOL_{t+1}$
<i>Intercept</i>	-0.867*** (-6.34)	-0.657*** (-9.26)	-0.811*** (-8.61)	-0.593*** (-12.18)
<i>Pledge<sub>t</sub></i>	-0.030* (-1.71)	-0.030*** (-3.27)		
<i>Post<sub>t</sub></i>	-0.114*** (-5.99)	-0.101*** (-10.22)	-0.197*** (-12.04)	-0.146*** (-17.39)
<i>Pledge<sub>t</sub> * Post<sub>t</sub></i>	0.066*** (2.67)	0.050*** (3.87)		
<i>Pledge_R<sub>t</sub></i>			-0.668*** (-10.55)	-0.310*** (-9.29)
<i>Pledge_R<sub>t</sub> * Post<sub>t</sub></i>			0.515*** (10.66)	0.287*** (11.51)
<i>Control variables in Table 6</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	10,876	10,876	20,998	20,998
<i>adj. R<sup>2</sup></i>	0.034	0.057	0.044	0.064

This table presents the results of using PSM and 2SLS. Panels A and B examine the influence of pledge competition on pledge firms' annual report tone management and crash risk, respectively. The control variable coefficients are suppressed for brevity. The *t*-statistics, computed with robust standard errors, are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

endogeneity issue that competition induces pledgees to lend money to firms with high annual report tone management or crash risk.

### 5.3.2. Alternative pledgee competition and share pledge measures

We also examine whether our main findings are robust to the use of alternative pledgee competition measures. The alternative measures are commonly used proxies of competition: (i) the total number of pledgees (*NUM*) and (ii) market concentration, via the Herfindahl–Hirschman Index (*HHI*). We re-estimate Eq. (1) and Eq. (3) with *NUM* or *HHI* as the pledgee competition measure and report the results in Table 10. With

Table 10  
Robustness checks (alternative pledgee competition measures).

Panel A: Influence of pledge competition on pledge firms' annual report tone management				
	(1) <i>Tone<sub>t</sub></i>	(2) <i>AbTone<sub>t</sub></i>	(3) <i>Tone<sub>t</sub></i>	(4) <i>AbTone<sub>t</sub></i>
<i>Intercept</i>	0.544*** (44.19)	0.032*** (2.71)	0.512*** (39.32)	0.033*** (2.68)
<i>Pledge<sub>t</sub></i>	0.001 (0.46)	0.005 (1.64)	0.015*** (4.98)	0.019*** (6.61)
<i>NUM<sub>t</sub></i>	-0.000*** (-24.70)	0.000 (0.08)		
<i>Pledge<sub>t</sub> * NUM<sub>t</sub></i>	0.000*** (4.24)	0.000*** (2.94)		
<i>HHI<sub>t</sub></i>			-0.224*** (-23.23)	0.005 (0.56)
<i>Pledge<sub>t</sub> * HHI<sub>t</sub></i>			0.030* (1.70)	0.046*** (2.68)
<i>Control variables in Table 4</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	20,998	20,998	20,998	20,998
<i>adj. R<sup>2</sup></i>	0.171	0.024	0.166	0.024
Panel B: Influence of pledge competition on pledge firms' stock price crash risk				
	(1) <i>NCSKEW<sub>t+1</sub></i>	(2) <i>DUVOL<sub>t+1</sub></i>	(3) <i>NCSKEW<sub>t+1</sub></i>	(4) <i>DUVOL<sub>t+1</sub></i>
<i>Intercept</i>	-1.005*** (-10.70)	-0.576*** (-11.72)	-1.054*** (-10.81)	-0.626*** (-12.26)
<i>Pledge<sub>t</sub></i>	-0.153*** (-7.30)	-0.106*** (-9.55)	0.082*** (3.74)	0.037*** (3.36)
<i>NUM<sub>t</sub></i>	-0.001*** (-13.81)	-0.000*** (-13.37)		
<i>Pledge<sub>t</sub> * NUM<sub>t</sub></i>	0.001*** (8.10)	0.000*** (9.78)		
<i>HHI<sub>t</sub></i>			-0.743*** (-10.93)	-0.382*** (-11.11)
<i>Pledge<sub>t</sub> * HHI<sub>t</sub></i>			0.563*** (4.71)	0.334*** (5.35)
<i>Control variables in Table 6</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	20,998	20,998	20,998	20,998
<i>adj. R<sup>2</sup></i>	0.044	0.055	0.038	0.051

This table presents the results of using alternative measures of pledgee competition. Panels A and B examine annual report tone management and crash risk, respectively. The control variable coefficients are suppressed for brevity. The *t*-statistics, computed with robust standard errors, are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

the alternative pledgee competition measures, the results are qualitatively similar to those in Tables 4 and 6. This suggests that our findings are robust to the use of alternative pledgee competition measures.

One may argue that there are measurement errors associated with the share pledge indicator variable, *Pledge*. To address this concern, we construct alternative share pledge measures using two proxies: (i) how many times the controlling shareholders pledge their shares in 1 year (*NPledge*) and (ii) the pledge ratio (*RPledge*), computed as the percentage of pledged shares in the controlling shareholders' shareholdings. We re-estimate Eq. (1) and Eq. (3) with *NPledge* or *RPledge* as the share pledge measure and report the results in Table 11. The results are similar to those in Tables 4 and 6, suggesting that our findings are not driven by measurement errors.

Table 11  
Robustness checks (alternative share pledge measures).

Panel A: Influence of pledge competition on pledge firms' annual report tone management

	(1) <i>Tone<sub>t</sub></i>	(2) <i>AbTone<sub>t</sub></i>	(3) <i>Tone<sub>t</sub></i>	(4) <i>AbTone<sub>t</sub></i>
<i>Intercept</i>	0.575*** (47.36)	0.040*** (3.44)	0.567*** (46.64)	0.031*** (2.66)
<i>NPledge<sub>t</sub></i>	0.006*** (3.31)	0.008*** (4.86)		
<i>Post<sub>t</sub></i>	-0.040*** (-24.18)	0.002 (1.25)	-0.038*** (-22.93)	0.004** (2.23)
<i>NPledge<sub>t</sub> * Post<sub>t</sub></i>	0.006*** (2.72)	0.004** (2.06)		
<i>RPledge<sub>t</sub></i>			0.002** (2.33)	0.003*** (3.57)
<i>RPledge<sub>t</sub> * Post<sub>t</sub></i>			0.003** (2.13)	0.002 (1.37)
<i>Control variables in Table 4</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	20,998	20,998	20,998	20,998
<i>adj. R<sup>2</sup></i>	0.167	0.026	0.165	0.022

Panel B: Influence of pledge competition on pledge firms' stock price crash risk

	(1) <i>NCSKEW<sub>t+1</sub></i>	(2) <i>DUVOL<sub>t+1</sub></i>	(3) <i>NCSKEW<sub>t+1</sub></i>	(4) <i>DUVOL<sub>t+1</sub></i>
<i>Intercept</i>	-0.898*** (-9.60)	-0.638*** (-13.16)	-0.907*** (-9.69)	-0.639*** (-13.16)
<i>NPledge<sub>t</sub></i>	-0.040*** (-3.48)	-0.030*** (-5.00)		
<i>Post<sub>t</sub></i>	-0.137*** (-12.24)	-0.105*** (-18.05)	-0.133*** (-11.71)	-0.102*** (-17.32)
<i>NPledge<sub>t</sub> * Post<sub>t</sub></i>	0.074*** (5.08)	0.046*** (6.10)		
<i>RPledge<sub>t</sub></i>			-0.019*** (-3.11)	-0.014*** (-4.41)
<i>RPledge<sub>t</sub> * Post<sub>t</sub></i>			0.039*** (4.14)	0.023*** (4.59)
<i>Control variables in Table 6</i>	YES	YES	YES	YES
<i>Province &amp; Industry</i>	YES	YES	YES	YES
<i>N</i>	20,998	20,998	20,998	20,998
<i>adj. R<sup>2</sup></i>	0.039	0.059	0.039	0.059

This table presents the results of using alternative measures of share pledge. Panels A and B examine annual report tone management and crash risk, respectively. The control variable coefficients are suppressed for brevity. The *t*-statistics, computed with robust standard errors, are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

## 6. Conclusions

We find that pledgee competition is positively associated with pledge firms' annual report tone management. The evidence is in line with the view that competition pressures pledgees to lower their monitoring incentives to remain competitive.

We further examine the cross-sectional variation in the influence of pledgee competition on pledge firms' annual report tone management from two perspectives: (i) pledge firms' credit quality and (ii) whether pledge firms are non-SOEs. We find the positive relationship between pledgee competition and the annual report tone management of pledge firms to be more evident for pledge firms with lower credit quality and pledge firms that are non-SOEs. This finding suggests that when pledge firms have a higher default risk or are more vulnerable to losing control rights, competition lowers pledgees' monitoring incentives to a greater extent.

We further show that higher pledgee competition results in the higher future crash risk of pledge firms. This relationship increases with the annual report tone of pledge firms, which corroborates the evidence that competition changes pledgees' monitoring practices and thus induces pledge firms to withhold bad news.

We perform a series of tests to address concerns over potential endogeneity. These tests include utilizing an exogenous shock to investigate the effect of pledgee competition, ruling out alternative explanations, using PSM to choose the control sample, and exploiting 2SLS regressions. All of these tests produce consistent results that support our main findings, suggesting that our results are unlikely to be driven by potential endogeneity.

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