



Hastily announced: Mergers and acquisitions with pledging shareholders[☆]

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ABSTRACT

This study examines how controlling shareholders' pledging behavior influences firms' acquisition decisions. Employing a sample of Chinese listed firms from 2010 to 2018, we find that firms with pledging controlling shareholders are more likely to announce merger and acquisition (M&A) deals than firms with non-pledging shareholders. The positive relationship between share pledging and M&A announcements is more pronounced when the margin call pressure is higher. We show that the link between share pledging and M&As is best explained by the controlling shareholders' fear of losing control, and is unlikely due to shareholder expropriation or optimism. Further analyses indicate that pledge-related acquisitions are associated with a lower success rate, longer trading suspension periods, and smaller (yet positive) market returns.

1. Introduction

Share pledging is the practice where the company stock is used by corporate insiders as collateral for personal loans, and it has become a worldwide phenomenon in recent years.¹ In the United States (U.S.), 20% of firms are reported to have share pledging, and insiders pledge 40% of their shares on average (Anderson and Puleo, 2020; Shen et al., 2021). In India, insiders in more than 20% of listed companies pledge their shareholdings.² In Taiwan, about 40–50% of listed firms pledge stocks, and the average pledge ratio is about 25% (Wang and Chou, 2018). Share pledging is also observed in other countries, including Australia, China, and the United Kingdom.

While share pledging can provide additional liquidity for pledgers, recent research shows that insider share pledging significantly influences corporate decisions, such as payout, investment in research and development, and earnings management (Anderson and Puleo, 2020; Li et al., 2020; Wang and Chou, 2018). Share pledging is also found to be

associated with negative shareholder wealth (Dou et al., 2019). In this study, we examine how pledging companies in less developed capital markets use the announcement of corporate acquisitions to support stock prices. For this purpose, we focus on the Chinese stock market, where share pledging is far more prevalent than in developed markets and merger and acquisition (M&A) announcements usually generate positive returns in the short term.

For controlling shareholders, the most attractive advantage of share pledging is to obtain loans without reducing shareholding, in contrast to obtaining cash by selling equity. As part of the share-pledge contract, however, margin requirements demand the pledged stocks' market value to be higher than a certain percentage of the loan. Once the price of the pledged stock falls below a certain threshold, pledgers are obliged to deposit additional stocks or make earlier repayments of the loan. If pledgers fail to meet the margin requirements, pledgees can then sell the pledged stocks. In such cases, the controlling shareholder may lose control rights if the quantity of shares being sold is sufficiently large.

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¹ While, theoretically, shareholders can use the cash from pledging to support the underlying firm's operation, our analyses suggest that this only happens in 2.29% of the cases. In 94.20% of the cases examined, cash from pledging was used by shareholders for other unrelated purposes.

² Press Trust of India: India Inc's pledged holdings reach to 1.4 trillion, The Economic Times. 8th May, 2013.

Therefore, pledging shareholders have strong incentives to support the stock price especially when the margin call pressure is high.³ Our study reveals that pledging controlling shareholders manipulate the timing of M&A announcements to fend off the margin call pressure, as such announcements often lead to higher stock prices in less developed markets.

Bagnoli and Lipman (1996) demonstrate that a takeover bid may be announced solely to manipulate a target firm's stock price. It is also common for acquirers to earn positive or at least nonnegative abnormal returns in a less-competitive market (Alexandridis et al., 2017). In China, M&A announcements generally result in positive market reactions (Chi et al., 2011; Gaur et al., 2013), and news articles have repeatedly reported that companies exploit M&A announcements to support stock prices. In addition to an immediate boost to the stock price, another benefit of announcing M&As when facing the margin call pressure is that controlling shareholders can apply for trading suspension to stop stock prices from slumping. In many cases, this provides controlling shareholders with valuable time to meet margin requirements.

A typical case is Tiansheng New Materials, a new energy company that engages in research and manufacturing of silicone sealing materials. In the first half of 2015, the company's stock price increased by 126%, reaching a peak on June 18, 2015. During this period, the company's controlling shareholder pledged, discharged, and re-pledged stocks many times. From June 18, 2015, the company's stock price dropped by nearly 55% over 20 days and fell to a record low on July 7, 2015. The controlling shareholder faced severe margin call pressure, and announced trading suspension on that day for a potential M&A. Tiansheng New Materials suspended trading for more than 5 months and disclosed the details of the M&A on December 10, 2015. The company then resumed trading on December 21, 2015. Upon the resumption of trading, its stock price rose by 117.56% within 7 days. However, the announced M&A deal was withdrawn for undisclosed reasons on July 20, 2016.

Using a sample of Chinese listed firms from 2010 to 2018, we find that firms are more likely to make M&A announcements when controlling shareholders pledge shares, and the likelihood of making an M&A announcement increases with a rise in the proportion of pledged shares to total shares. Using changes in firms' annual and quarterly stock returns to proxy the margin call pressure, we show that the impact of share pledging on M&A propensity is stronger when controlling shareholders face high margin call pressure. We further find that pledge-related M&As are associated with a significantly longer trading suspension time than those initiated by non-pledging firms, as pledging shareholders utilize the suspension to alleviate the margin call pressure.

To mitigate concerns that share pledging is an endogenous choice, we conduct an instrumental variable (IV) analysis using a 2013 regulation change on share pledging. This regulation broadened the list of pledgees, while standardizing share-pledging procedures. We use this regulation to identify exogenous changes in the extent of share pledging across different types of firms. Our benchmark results are robust to this IV strategy. We also conduct an out-of-sample test using a sample of state-owned firms (SOEs). The controlling shareholder of SOEs (i.e., the state) is unlikely to lose control rights even when margin requirements are not met, as there are strict restrictions on the selling of state-owned shares. We find no significant relationship between share pledging and acquisitions for SOEs, which lends further support to our control rights motive hypothesis.

We rule out two alternative explanations for the observed link between share pledging and M&As. First, share pledging can aggravate

agency problems and lead to expropriating takeovers. Related-party transactions, overpayment, and poor post-acquisition performance are typical symptoms of expropriating acquisitions. Nevertheless, we find that share pledging does not significantly affect the likelihood of related-party M&As. We also find no evidence that pledging firms overpay for targets, nor is the post-acquisition performance of pledging firms poorer than that of non-pledging firms. Second, we examine the possibility that share pledging and M&A announcements are simultaneously driven by optimism, in that more optimistic controlling shareholders are more likely to launch acquisitions and pledge stocks. Using two different proxies for optimism, we find that the relationship between share pledging and M&As remains the same, whether or not the controlling shareholders appear to be optimistic.

Further analysis suggests that pledging shareholders may prematurely announce M&As when facing the risk of losing control. If pledging firms make M&A announcements hastily to manipulate stock prices, such deals should be less likely to succeed. Consistent with this conjecture, we show that pledge-related M&As are more likely to be withdrawn than other M&As. We also find that firms with pledging shareholders take more time to reply to the *China Securities Regulatory Commission's* (CSRC) inquiries about the announced M&As, indicating that such deals may be less prepared. We find that the cumulative abnormal returns (CARs) surrounding M&A announcements for pledging firms are lower than that for non-pledging firms, and this negative relationship is more pronounced when the ratio of pledged shares rises. This finding suggests that investors likely realize that pledging firms may simply exploit M&A announcements to relieve margin call pressure and such deals are less likely to succeed on average.

Our study contributes to three strands of literature. First, our study is related to the growing body of literature on share pledging. Recent literature has investigated the impact of share pledging on firm valuation (Li et al., 2019; Wang and Chou, 2018), risks (Anderson and Puleo, 2020; Dou et al., 2019), executive pay-for-performance sensitivity (Ouyang et al., 2019), dividend payments (Li et al., 2020), innovation (Pang and Wang, 2020), and share repurchases (Chan et al., 2018). Our study adds to the literature by providing a causal inference on share pledging and M&As, which also adds to the policy discussion on regulating such activities.

Second, our study adds to the literature that links personal practices of controlling shareholders to firm decisions. Block ownership is prevalent in many countries, particularly in developing countries (Claessens et al., 2000; La Porta et al., 1999; La Porta et al., 1998), and it entails significant benefits and costs (Admati et al., 1994; Anderson and Reeb, 2003; Basu et al., 2009; Burkart et al., 2003; Isakov and Weisskopf, 2014; La Porta et al., 1999; Shleifer and Vishny, 1997). While evidence is mixed regarding the effect of controlling shareholders on firm value, there is little doubt that controlling shareholders can significantly influence corporate decision-making. We advance this strand of literature by documenting how controlling shareholders' personal share pledging, which is an increasingly widespread phenomenon, affects corporate investment policies and firm value.

Finally, our study contributes to the literature regarding the motivations and market reactions to M&As, particularly those in less-competitive markets. The extant M&A literature indicates several motives for corporate acquisitions, such as to obtain synergy (Bradley et al., 1988; Eun et al., 1996), market power (Borenstein, 1990; Kim and Singal, 1993), and resources (Chen et al., 2021; Wernerfelt, 1984), or to avoid taxes (Auerbach and Reishus, 1987; Belz et al., 2013). Our study documents a new motive for controlling shareholders to initiate M&As in less-competitive markets. That is, to utilize M&A announcements to boost stock prices and to ease the risk of losing control rights.

In a contemporary study, Zhu et al. (2021) also find that share pledging is positively associated with M&As. While sharing the same baseline results, our study differs from Zhu et al. (2021) in several ways. First, by examining a sample of completed M&A deals during 2004–2016, Zhu et al. (2021) find that the M&A deals announced by

³ It is a common practice in China for loans obtained through share pledging to be recourse, meaning that the lender can seize the pledging shareholder's assets, rather than stocks, if the value of the pledged shares becomes lower than the value of the loan. (See http://www.sse.com.cn/lawandrules/sserules/trading/stock/c/c_20180112_4449493.shtml).

pledging firms have higher abnormal returns than those announced by firms without pledging, lending support to their conclusion that pledging shareholders are able to execute value-enhancing M&As amid the threat of control transfer. We show that this result is largely driven by M&As initiated by pledging firms during the early period 2004–2009 and by completed M&A deals. In our study, we examine both completed and incomplete M&A deals during 2010–2018. We exclude 2004–2009 from our sample to reduce the impact of major adjustments in Chinese Accounting Standards in 2007 and the global financial crisis in 2008. Share pledging also became more widespread among Chinese listed firms during our sample period. Importantly, we find that M&A deals by pledging firms during our sample period were less likely to succeed and generated lower abnormal returns than deals initiated by non-pledging firms. Second, [Zhu et al. \(2021\)](#) examine the relationship between pledging and M&As in general. In our study, we make an explicit attempt to identify controlling shareholders that face high margin call pressure, and we demonstrate a stronger link between pledging and M&As for such firms. We also provide evidence that some pledging firms may merely manipulate the timing of M&As to boost their stock prices.

The remainder of this paper is structured as follows. [Section 2](#) reviews the related literature and develops testable hypotheses. [Section 3](#) provides the details of our data and sample construction. [Section 4](#) presents empirical findings, and [Section 5](#) concludes.

2. Related literature and hypothesis development

2.1. Studies on share pledging

A growing body of literature has explored how insider share pledging influences firms' activities. Early studies in this field characterize share pledging as an indicator of corporate governance risk ([Lee and Yeh, 2004](#)). It has also been argued that collateralized shares aggravate agency problems and may negatively affect firm performance ([Kao et al., 2004](#)). [Dou et al. \(2019\)](#) find that insider share pledging has a negative impact on shareholder wealth as it increases firms' stock-crash risk and leads to more conservative investment policies. [Anderson and Puleo \(2020\)](#) find that insider pledging increases firm-specific risk, and corporate insiders appear to be extracting private benefits through pledging activity at the expense of outside shareholders. In contrast, [Li et al. \(2019\)](#) find a positive association between insider share pledging and firm value, based on a sample of Chinese listed firms. The authors argue that insider share pledging signals optimism about a firm's future performance and that the margin call pressure has a disciplining effect on controlling shareholders.

Other studies have examined the impact of regulatory changes on insider share pledging. Using U.S. data, [Shen et al. \(2021\)](#) find that pledging behavior is less severe in the U.S. compared to less-competitive markets such as China, India, and Taiwan, and the Institutional Shareholder Services' warning in 2013 against pledging significantly deterred such practices. [Wang and Chou \(2018\)](#) investigate stock-market reactions to three regulatory changes in Taiwan that reduce incentives for share pledging. They find that firms with insider share pledging experience more positive stock returns after the regulations are implemented, suggesting that share pledging negatively affects firms' value.

Our study is closely related to the strand of literature regarding how share pledging changes firms' activities due to the fear of losing control rights. Control rights are associated with rent diversion and private benefit extraction ([Dyck and Zingales, 2004](#)). When controlling shareholders pledge shares, margin requirements are typically included in share-pledge agreements.⁴ Pledging shareholders must provide additional capital or stocks when a margin call occurs, or pledgees will sell the pledged shares on the open market. If the number of pledged shares

is sufficiently large, pledging shareholders could lose control rights and the associated personal benefits. Thus, pledging shareholders have strong incentives to support stock prices and maintain control rights, which could distort corporate decisions. [Chan et al. \(2018\)](#) show that companies with a high percentage of shares pledged by controlling shareholders are more likely to initiate share repurchases to fend off potential margin calls. [Pang and Wang \(2020\)](#) demonstrate that share pledging impedes firm innovation as controlling shareholders become risk averse. [Singh \(2018\)](#) and [DeJong et al. \(2020\)](#) find that firms engage in earnings management to avoid the margin call pressure. In this study, we document that controlling shareholders also use M&A announcements to alleviate the margin call pressure in a less-competitive market.

2.2. Testable hypotheses

Controlling shareholders who pledge shares gain two benefits from M&A announcements. First, while the corporate finance literature has contended that acquirers usually experience non-positive M&A announcement returns in developed markets such as the U.S. ([Renneboog and Vansteenkiste, 2019](#)), M&A announcements often send a positive signal in less-competitive markets. In China, acquirers usually obtain positive abnormal returns around M&A announcements ([Li and Chen, 2002](#); [Chi et al., 2011](#); [Black et al., 2015](#); [Zhou et al., 2015](#); [Yang et al., 2019](#)).⁵ Thus, announcing M&As can be an effective strategy to boost stock prices in China. Controlling shareholders of pledging firms facing high margin call pressure may even hastily announce M&A deals simply to support the stock price and avoid the loss of control rights.

Second, as a common practice, listed firms can apply for trading suspension after announcing a major M&A transaction. Trading suspension not only temporarily stops stock prices from further declines but also gives pledgers more time to react to the margin calls. Previous research has indicated that trading suspension during market turmoil can suppress cash outflow and is associated with higher returns in the short term ([Huang et al., 2018](#)). Trading suspension has also been found to be an effective way of disseminating new information ([Engelen and Kabir, 2006](#)), which helps mitigate misinformed trading and prevent stock price crashes. Controlling shareholders with pledged shares who face high margin call pressure can take advantage of trading suspensions to raise additional capital or deploy other measures, which reduces the risk of losing control.

For these reasons, we hypothesize that announcing M&A deals can be an effective strategy for pledging firms to fend off the margin call pressure in China. Based on the discussion above, we propose the first testable hypothesis as follows:

Hypothesis 1. Pledging firms are more likely to initiate M&A deals than non-pledging firms.

When a margin call occurs, pledged shares could be sold in the open market unless the controlling shareholders can provide additional collateral or make an early repayment of the loan. If announcing M&As is an effective way to support stock prices, controlling shareholders should have particularly strong incentives to initiate M&As when the margin call pressure is high. This observation leads to our next hypothesis.

Hypothesis 2. The positive relationship between share pledging and M&A announcements is stronger when the margin call pressure is higher.

M&A announcements usually lead to trading suspension, which

⁴ In China, if the market value of the pledged shares falls below 135% of the loan amount, a margin call occurs.

⁵ The Chinese stock market is dominated by individual investors whose investment activities are highly speculative ([Ng and Wu, 2007](#)), seeking to "buy low, sell high" with an extremely short investment horizon. M&As are one of the most commonly used signals to push up stock prices in the Chinese stock market. The CSRC has criticized this kind of M&A on multiple occasions.

could provide valuable time for pledging firms to deal with their margin call pressure. For example, pledging firms can utilize the suspension time to raise capital as additional collateral to pledges, which is one way to avoid shares being sold. The pledger can also use the time to raise money to make an early loan repayment or release new information to support stock prices. For these reasons, we propose the third hypothesis below:

Hypothesis 3. Pledging firms require a longer trading suspension after the M&A announcement than non-pledging firms, particularly when they are under high margin call pressure.

If pledging firms announce M&A deals to simply boost stock prices or initiate trading suspension when facing severe margin calls, such M&A deals are likely to be announced hastily and hence, should be less likely to be completed due to lack of preparation. In extreme cases, some pledging firms may terminate the announced deals once the margin call pressure is relieved. Based on this rationale, we propose the fourth hypothesis.

Hypothesis 4. M&A deals announced by pledging firms are less likely to succeed than those announced by non-pledging firms, especially when they are under high margin call pressure.

As documented by Chan et al. (2018), pledging firms receive a less favorable market reaction to repurchase announcements when the announcement is solely used to ease the margin call pressure. Similarly, if controlling shareholders primarily announce M&As to relieve the margin call pressure, we expect the market reaction to be less favorable compared with M&As that are announced in other cases. In addition, related to Hypothesis 4, if investors anticipate that M&As announced by pledging firms have a lower success rate on average, they should react less positively to such announcements. Our final hypothesis is as follows:

Hypothesis 5. M&A deals announced by pledging firms generate lower abnormal returns than those announced by non-pledging firms.

3. Data, variables, and research design

3.1. Data and sample construction

Our empirical analyses are based on a sample of all Chinese listed firms on the Shanghai and Shenzhen stock exchanges from 2010 to 2018.⁶ M&A transaction information is obtained from the major restructuring events section of the WIND database.⁷ The firm-level characteristic variables come from the China Stock Market & Accounting Research (CSMAR) database.⁸ In our benchmark analyses, we exclude firms in the financial and public utility industries and those with missing data. We also exclude firms without controlling shareholders

⁶ We employ Chinese data because China presents a unique institutional setting for investigating the effects of share pledges on M&As. First, share pledging is a far more prevalent practice in China than in developed markets such as the U.S. and the U.K., as the regulations in China impose comparatively fewer restrictions on share pledging. Second, the Chinese capital market is characterized by highly concentrated ownership. As reported by Claessens et al. (2000), more than two-thirds of firms in East Asian economies are controlled by a single shareholder. Concentrated ownership is the basis for controlling shareholders to manipulate M&A announcements under margin call pressure.

⁷ The WIND database has more comprehensive coverage of valuation information for M&A targets than the CSMAR database. Since we use valuation information to calculate the take-over premium, we use the WIND database to obtain M&A information.

⁸ The coverage of firm-level characteristics in CSMAR is similar to that of WIND. One advantage of CSMAR is that it provides both cash flow rights and voting rights for each firm's controlling shareholder, while WIND only reports cash flow rights. For consistency, we thus choose to obtain firm-level variables from CSMAR.

and SOEs since the controlling shareholder (i.e., the state) has incentives that are distinct from those of non-SOEs. Finally, we obtained 1909 firms and 8063 firm-year observations in the firm-level panel data. Table B1 in Appendix B documents our sample selection process. The final deal-level sample includes 1355 acquisitions by 917 listed firms during 2010–2018, 65% of which were announced by firms with share pledges, and the average share-pledge ratio was nearly 70%.

Panel A of Table 1 presents the proportion of firms announcing M&As among total firms each year during our sample period (column (1)). This percentage began to increase in 2012 and peaked in 2015. This pattern is consistent with the general trend of the M&A market in China.⁹ Column (2) indicates that the proportion of Chinese listed firms with share pledges increased from 27% in 2010 to almost 73% by 2018. For firms with share pledging, the ratio of shares pledged to total shares held by controlling shareholders is rather high, at between 60% and 75% on average (column (3)).

Panel B of Table 1 presents the proportion of firms announcing M&As by year for firms with and without share pledges. Consistent with our hypothesis, the former is more likely to announce an M&A deal in all years. The difference between the two types of firms becomes both large and significant from 2014 onward. This comparison provides initial evidence that pledging firms have a greater tendency to engage in M&As.

Table 1

Distribution of M&A announcement and share pledges.

Panel A: Full sample				
Year	(1) % of firms releasing M&A announcement	(2) % of firms having share pledges	(3) Share pledge ratio (%)	
2010	5.63	27.93	75.14	
2011	2.88	27.57	73.43	
2012	4.51	24.74	69.92	
2013	9.19	39.78	70.64	
2014	17.32	48.56	64.93	
2015	26.83	55.75	63.40	
2016	19.86	63.03	58.29	
2017	12.51	69.89	60.64	
2018	12.92	72.74	61.47	
Panel B: M&A announcements by pledging and non-pledging firms				
Year	% of pledging firms releasing M&A announcement	% of non-pledging firms releasing M&A announcement	T-test	
			Difference	p-value
2010	6.45	5.31	1.14	0.641
2011	3.92	2.49	1.43	0.368
2012	6.25	3.94	2.31	0.181
2013	9.24	9.16	0.08	0.966
2014	21.44	13.43	8.01***	0.001
2015	30.84	21.78	9.06***	0.002
2016	23.75	13.22	10.52***	0.000
2017	15.06	6.59	8.47***	0.000
2018	14.78	7.95	6.83***	0.000

Notes: This table reports the distribution of M&A announcements and share pledges in our benchmark sample. The share pledge ratio is the ratio of shares pledged to total shares owned by the controlling shareholder. Panel A reports sample distribution of M&A announcements and share pledges by year for the full sample. Panel B presents the distribution of M&A announcements for pledging and non-pledging firms by year. We test whether the differences in the proportion of M&A announcements between pledging and non-pledging firms are significant. The last column of Panel B reports the associated p-values.

⁹ See <https://imaa-institute.org/m-and-a-in-china/>.

3.2. Key variables

The two key independent variables in our empirical analysis are *Pledge dummy* and *Pledge ratio*. *Pledge dummy* is an indicator that equals one if the controlling shareholder has pledged shares to financial institutions at the end of a certain year (or quarter), and zero otherwise. To capture the impact of changes in the proportion of shares being pledged, we use the continuous variable *Pledge ratio*, which is the percentage of pledged shares in the total shareholdings by controlling shareholders at the end of a given year.

To examine the impact of share pledging on M&A announcements, we use *M&A dummy* as the key outcome variable, which is an indicator that equals one if the firm announces at least one major merger and acquisition transaction during a given year, and zero otherwise. To test [Hypothesis 3](#), we construct the variable *Ln (suspension days)*, which is the natural logarithm of days between the suspension and resumption of trading after the M&A announcement. To test [Hypothesis 4](#), we construct a dummy variable *Success*, which equals one when an M&A deal is successfully completed and zero otherwise.

We use CARs to measure the short-term market reaction around M&A announcements. Specifically, we calculate the CARs based on the market model proposed by [Brown and Warner \(1985\)](#). First, we use returns over the estimation window to perform the ordinary least squares (OLS) regression, as specified by [Eq. \(1\)](#).

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_i \tag{1}$$

where R_{it} is the daily stock return (considering cash dividend reinvestment) of firm i , and R_{mt} represents the daily market index return.¹⁰ We set the announcement date of the M&A deal as Day 0 and use 11–150 trading days prior to the announcement as the estimation window.¹¹ We estimate [Eq. \(1\)](#) to obtain $\hat{\alpha}_i$ and $\hat{\beta}_i$ for each firm. We then use these estimated parameters to calculate the normal return ($\hat{\alpha}_i + \hat{\beta}_i R_{mt}$) and the CARs based on [Eq. \(2\)](#).

$$CAR_{it}(-T, T) = \sum_{t=-T}^T [R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt})] \tag{2}$$

where $(-T, T)$ indicates the event window, which starts from the T th trading day before the M&A announcement and ends on the T th day following the announcement.

To evaluate the long-run post-acquisition stock performance, we calculate the buy-and-hold abnormal returns (BHARs). Using the approach suggested by [Lyon et al. \(1999\)](#), we calculate the size- and book-to-market ratio-adjusted BHARs of firm i within M months after the M&A announcements as follows:

$$BHAR_{it}(0, M) = \prod_{t=0}^M (1 + R_{it}) - \prod_{t=0}^M (1 + R_{pt}) \tag{3}$$

where R_{it} and R_{pt} represent the monthly stock return of acquirer i and the benchmark portfolio t months after the acquisition announcement. We construct 25 benchmark portfolios grouped by firm size and book-to-market ratio in the spirit of [Fama and French \(1992\)](#).

Besides the key dependent variables above, we also construct four additional dependent variables to examine the effects of share pledge on other characteristics of M&A transactions. (1) *Relevance dummy*: This is an indicator of whether an M&A deal takes place between related parties. If an M&A deal is a related-party transaction, *Relevance dummy* equals one, and zero otherwise. (2) *Takeover premium*: It measures the

¹⁰ For firms listed on the Shanghai Stock Exchange, we use the SSE index return. For firms listed on the Shenzhen Stock Exchange, we use the SZSE index return.

¹¹ We exclude mergers for which we do not observe 140 trading days prior to the deals.

extent to which acquirers overpaid, which equals the value acquirers paid divided by the estimated value of the targets (reported in the WIND database) minus one. (3) *Changes in operating performance*: We use changes in the acquirer’s operating performance before and after M&A deals as a proxy for post-acquisition performance. As suggested by [Barber and Lyon \(1996\)](#) and [Huang et al. \(2014\)](#), we first identify listed firms within the same two-digit industry as the industry-performance benchmark for each acquirer. We then calculate the benchmark-adjusted operating performance as each acquirer’s return on assets (ROA) minus the corresponding industry-level median ROA (denoted as *industry-median-adjusted ROA*). The dependent variable is *changes in operating performance*, which captures the change in *industry-median-adjusted ROA* from one year before the acquisition to one year after the acquisition. (4) *Days before replying to CSRC*: It is the number of days before the acquirer replying to CSRC’s inquiry on the M&A announcement. The data of inquiries on M&As are from the CNRDS database. The inquiry data starts from 2015. We calculate the days between the CSRC’s inquiry date and the listed firm’s reply date, and use the number of days before replying to CSRC’s inquiries as the dependent variable.

For these and other variables used in our empirical analysis, we provide detailed definitions in Appendix A. [Table 2](#) presents the summary statistics for the key variables in our empirical analyses. All continuous variables are winsorized at 1st and 99th percentiles to reduce the influence of outliers. On average, pledging firms are larger, older, more leveraged, and grow faster. Pledging firms also enjoy higher stock prices as a ratio to net assets per share. However, pledging firms are less profitable, as reflected in the lower ROA. They also report lower earnings per share, lower operating cash flows, and lower net profit margins.

3.3. Empirical strategy

To investigate how share pledging influences the likelihood of M&As, we use the following probit model:

$$\Pr(M\&A \text{ dummy} = 1)_{i,t} = \alpha + \beta \times Pledge \text{ dummy}(ratio)_{i,t-1} + \gamma X'_{i,t-1} + \mu_q + \theta_t + \varepsilon_{i,t} \tag{4}$$

where the dependent variable is a dummy variable that equals one if firm i announces at least one M&A during a year (or quarter), and zero otherwise. *Pledge dummy* $_{i,t}$ is a dummy indicating a pledging firm in year t . In some specifications, we alternatively use *Pledge ratio* $_{i,t}$, which is a continuous variable for the ratio of pledged shares to total shareholding by the controlling shareholder. $X_{i,t-1}$ is a vector of control variables, including controlling shareholders’ cash flow rights, firm size, ROA, leverage, firms’ sales growth rate, firm age, earnings per share, book-to-market ratio, operating cash flow generation (operating cash inflow divided by sales), net profit margin, institutional shareholding, free cash flow scaled by sales, 180-day stock returns before the M&A announcement, and controlling shareholders’ voting rights. All independent variables are measured at $t - 1$. μ_q controls for industry fixed effects, and θ_t controls for time fixed effects. We use [Eq. \(4\)](#) to test [Hypothesis 1](#).

To test [Hypothesis 2](#), we create an indicator for high margin call pressure, and interact it with *Pledge dummy(ratio)*. We include both the indicator and the interaction term in [Eq. \(5\)](#):

$$\begin{aligned} \Pr(M\&A \text{ dummy} = 1)_{i,t} = & \alpha + \beta \times Pledge \text{ dummy}(ratio)_{i,t-1} \\ & \times High \text{ margin call pressure}_{i,t-1} + \rho \\ & \times Pledge \text{ dummy}(ratio)_{i,t-1} + \delta \\ & \times High \text{ margin call pressure}_{i,t-1} + \gamma X'_{i,t-1} \\ & + \mu_q + \theta_t + \varepsilon_{(i,t)} \end{aligned} \tag{5}$$

Table 2
Summary statistics for key variables.

Variable	Full sample (N = 8063)		Sample with share pledging (N = 4220)		Sample without share pledging (N = 3843)		T-test	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Difference	p-value
M&A dummy	0.135	0.342	0.173	0.378	0.093	0.290	0.081 ***	0.000
Pledge dummy	0.523	0.499	1.000	0.000				
Pledge ratio	0.332	0.389	0.635	0.312				
Cash flow rights	0.341	0.147	0.335	0.140	0.347	0.154	-0.012 ***	0.002
Ln (asset)	7.809	1.104	7.971	1.084	7.631	1.098	0.340 ***	0.000
ROA	0.056	0.062	0.052	0.059	0.061	0.066	-0.009 ***	0.000
Leverage	0.397	0.214	0.424	0.206	0.368	0.218	0.056 ***	0.000
Sales growth rate	0.185	0.394	0.209	0.418	0.158	0.365	0.051 ***	0.000
Age	16.592	5.210	17.315	5.096	15.797	5.218	1.517 ***	0.000
EPS	0.313	0.424	0.269	0.386	0.360	0.458	-0.091 ***	0.000
MB	5.152	5.412	5.191	5.154	5.110	5.681	0.080	0.505
OCF generation	0.067	0.212	0.060	0.217	0.076	0.208	-0.016 ***	0.001
Net profit margin	0.079	0.162	0.070	0.158	0.088	0.165	-0.018 ***	0.000
Institutional share	0.326	0.222	0.329	0.215	0.324	0.230	0.468	0.345
FCF	-0.039	0.504	-0.043	0.509	-0.035	0.498	-0.007	0.506
Past stock returns	-0.098	0.558	-0.088	0.570	-0.109	0.545	0.021 *	0.091
Voting rights	0.370	0.157	0.365	0.148	0.376	0.165	-0.010 ***	0.004

Notes: We report summary statistics for key variables for the full sample, the sub-sample of firms with share pledging, and that of firms without share pledging. All continuous variables are winsorized at 1% and 99% levels. The definitions of the variables are described in Appendix A. For each variable, we conduct the T-test on the null hypothesis that the mean values of each variable are equal between pledging and non-pledging firms. The associated p-values are reported in the last column.

If Hypothesis 2 holds, the parameter β in Eq. (5) should be positive. We use an analogous specification based on M&A deal-level data to estimate whether deals announced by pledging firms under high margin call pressure are associated with a longer trading suspension and are less likely to succeed.

To examine how share pledging affects other characteristics of the M&A deals and the market reactions to M&A announcements, we use our M&A deal-level data to conduct cross-sectional regressions based on the following equation:

$$Y_{i,j,t} = \alpha + \beta \times Pledge\ dummy(ratio)_{i,t-1} + \gamma X'_{i,t-1} + \mu_q + \theta_t + \varepsilon_{i,j,t} \quad (6)$$

where $Y_{i,j,t}$ is the outcome variable for deal j initiated by firm i in year t , which includes variables such as *Changes in operating performance*, *CARs*, and *BHARs*. Similar to Eq. (4), we control for a vector of firm characteristics, industry and time fixed effects when conducting the deal-level estimations.

4. Empirical results

4.1. Share pledges and the propensity to initiate M&As

4.1.1. Baseline results

We first investigate whether share pledges influence firms' propensity to initiate M&As. Specifically, we run probit regressions based on Eq. (4), where the dependent variable is a dummy that equals one if a firm announces at least one M&A in year t . Table 3 presents the results.

The estimated coefficient on *Pledge dummy* is positive and statistically differs from zero at the 1% significance level (column (1)). In column (2), we calculate the implied average marginal effect of all covariates. We find that share pledging by controlling shareholders is correlated with increased initiation of M&A deals by around 5.4%, representing a 40% increase over the sample mean (5.4%/13.5%).

Next, we instead include the continuous variable *Pledge ratio* in Eq. (4). In column (3), the estimated coefficient for *Pledge ratio* is positive and significant. The implied average marginal effect in column (4) is economically meaningful. The partial coefficient (0.092) indicates that a one standard deviation increase in the share-pledging ratio from its sample mean will cause a firm to be 3.54% more likely to initiate an M&A announcement, which is a 26.22% increase over the base case (0.092×0.389 , where 0.389 is the standard deviation of share-pledging ratio). These results are consistent with Hypothesis 1, indicating that pledging firms are more likely to initiate M&As compared with non-

Table 3
Effects of share pledges on initiation of M&A deals.

Dep. Var.: <i>M&A dummy</i>	(1) Coefficients	(2) Average marginal effects	(3) Coefficients	(4) Average marginal effects
<i>Pledge dummy</i>	0.279 *** (0.040)	0.054 *** (0.008)		
<i>Pledge ratio</i>			0.478 *** (0.050)	0.092 *** (0.010)
<i>Cash flow rights</i>	-0.003 (0.002)	-0.001 (0.000)	-0.002 (0.002)	-0.000 (0.000)
<i>Ln (asset)</i>	-0.135 *** (0.027)	-0.026 *** (0.005)	-0.140 *** (0.027)	-0.027 *** (0.005)
<i>ROA</i>	-0.022 *** (0.006)	-0.004 *** (0.001)	-0.022 *** (0.006)	-0.004 *** (0.001)
<i>Leverage</i>	0.003 *** (0.001)	0.001 ** (0.000)	0.003 ** (0.001)	0.000 ** (0.000)
<i>Sales growth rate</i>	0.001 *** (0.000)	0.000 *** (0.000)	0.001 ** (0.000)	0.000 ** (0.000)
<i>Age</i>	0.002 (0.004)	0.000 (0.001)	-0.001 (0.004)	-0.000 (0.001)
<i>EPS</i>	-0.107 (0.082)	-0.021 (0.016)	-0.070 (0.082)	-0.013 (0.016)
<i>MB</i>	0.008 ** (0.004)	0.002 ** (0.001)	0.008 ** (0.004)	0.002 ** (0.001)
<i>OCF generation</i>	-0.010 (0.090)	-0.002 (0.018)	-0.002 (0.089)	-0.000 (0.017)
<i>Net profit margin</i>	0.004 ** (0.002)	0.001 ** (0.000)	0.004 ** (0.002)	0.001 ** (0.000)
<i>Institutional share</i>	-0.000 (0.001)	-0.000 (0.000)	-0.001 (0.001)	-0.000 (0.000)
<i>FCF</i>	0.051 (0.037)	0.010 (0.007)	0.052 (0.037)	0.010 (0.007)
<i>Past stock returns</i>	-0.173 *** (0.038)	-0.034 *** (0.007)	-0.173 *** (0.038)	-0.033 *** (0.007)
<i>Voting rights</i>	0.005 ** (0.002)	0.001 ** (0.000)	0.006 *** (0.002)	0.001 ** (0.000)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs.	8063	8063	8063	8063

Notes: This table reports probit regressions of M&A propensity on share pledges. Columns (1) and (3) report the estimated coefficients of probit regressions. Columns (2) and (4) report the average marginal effects of all covariates. All independent and control variables are measured prior to the given year. All continuous variables are winsorized at 1% and 99% levels. Standard errors are robust and clustered over firms and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

pledging firms.

4.1.2. Controlling for potential endogeneity

Share pledging is an endogenous choice made by controlling shareholders. It is also possible that the positive relationship between share pledging and M&As is driven by some omitted factors. To address this concern, we adopted an IV approach. In 2013, the CSRC implemented a new regulation on share pledging, which was formally known as *The Guidance on Stock Pledge Repurchase Transactions, Registration, and Settlement*. The 2013 rule had different effects on firms with different magnitudes of share pledging. Before the 2013 rule, shareholders could only pledge shares with banks and trusts. The 2013 rule allowed controlling shareholders to pledge shares with securities companies for the first time, broadening the means of pledging for controlling shareholders. This regulation change should have encouraged controlling shareholders to participate in share pledging, particularly those who could not do so with banks before 2013. Consistent with this conjecture, [Table 1](#) shows a dramatic increase in the proportion of share-pledging firms in total listed firms since 2014. Moreover, the guidance imposed a restriction on the extent of share pledging, particularly for those who had pledged a high proportion of shares.¹² [Table 1](#) also shows that the ratio of shares pledged to the total shares held by controlling shareholders declined from 70% in 2013 to 61% in 2018, indicating that the guidance set tighter and more binding constraints.

We employ this regulation change as an IV for our key explanatory variable, *Pledge ratio*.¹³ Our approach is similar to that employed by [Stevenson \(2010\)](#) and [Ahern and Dittmar \(2012\)](#). Specifically, we define a dummy, *After2013*, that equals one since 2013 and zero otherwise. To instrument for *Pledge ratio*, we regard a firm as *Treated* if its pledge ratio is above the sample mean (70%) in 2012, one year before the regulation. We then interact *After2013* with the indicator *Treated* in the first-stage regression. Since the probit model is nonlinear, we use the two-stage residual inclusion (2SRI) regression ([Terza et al., 2008](#); [Wooldridge, 2015](#)) to conduct the IV estimation. This approach can provide the correct inference in nonlinear models where traditional 2SLS cannot. Column (1) of [Table 4](#) shows the first-stage estimation result, where the dependent variable is *Pledge ratio*. As expected, all firms increased the extent of share pledging after 2013, as the estimated coefficient on *After2013* is positive and highly significant. However, treated firms experienced a smaller increase in share pledging. We report the second-stage estimation result in column (2) of [Table 4](#). The estimated coefficient on *Pledge ratio* is positive and significant at the 1% level, which translates into a marginal effect of 9.2% (column (3)). We also use the two-staged probit model to perform the IV estimation. Column (4) of [Table 4](#) reports the first-stage probit regression result, where the dependent variable is *Pledge ratio*. Columns (5) and (6) present the second-stage probit regression results and the estimated marginal effects. Based on the two-staged probit model, we find a similar pattern that pledging firms are more likely to make M&A announcements than non-pledging firms. Overall, our IV regressions further support [Hypothesis 1](#).

4.1.3. Other robustness checks

We conduct several robustness checks. To control for the influence of firm-level time-invariant characteristics, we use a linear probability model to control for firm fixed effects. The OLS estimation results based on this specification are reported in columns (1) and (2) of [Table B2](#) in

the Appendix B. After controlling for firm fixed effects, we confirm the benchmark results that pledging firms initiate more M&A deals than non-pledging firms.

Next, we construct a five-year $[-2, +2]$ window sample that includes firms without share pledging in the first 2 years and with share pledging in the next 2 years. We then regress the M&A dummy on both the *Pledge dummy* and *Pledge ratio* using this five-year $[-2, +2]$ window sample. We report the results from this exercise in columns (3) and (4) of [Table B2](#). We continue to find that firms with (more) share pledging are more likely to initiate M&A deals.

4.2. Mechanisms

4.2.1. The fear of losing control rights

In the previous section, we demonstrate that share pledging is positively related to M&A announcements. In this section, we test [Hypothesis 2](#) and explore whether the fear of losing control rights leads to the observed link between share pledging and M&As.

The threat of losing control is more severe when controlling shareholders are confronted with the margin call pressure. A typical stock-pledge contract includes three key factors: 1) The benchmark value, the basis by which the loan amount is determined. A commonly used benchmark value is the pledging firm's average closing price the 7 days prior to the pledge date; 2) the loan-to-benchmark value ratio, which is the proportion of loans to the benchmark market value that can be as high as 60% in China; and 3) the margin call ratio, which is calculated by the actual market value of the pledged stocks relative to the amount of loans, which can be as low as 135%. For example, if a shareholder borrows \$1 million by pledging stocks and when the market value of pledged stocks falls to \$1.35 million, the lender will ask the borrower to increase collateral or repurchase pledged stocks.¹⁴

By these general terms, we can infer whether a margin call is triggered using [Chan et al. \(2018\)](#)'s method based on stock performance. Suppose a pledging firm's benchmark value is P , and its annual stock return is r . The loan-to-benchmark value ratio is 60%, and the margin call ratio is 135% in a typical share-pledging agreement. Once a firm's market value-to-loan ratio triggers a margin call, pledgers are required to deposit more funds. By setting $[P \times (1 + r)] / (60\% \times P) = 135\%$, we obtain $r = -19\%$. We then construct an indicator for high margin call pressure based on whether a firm's annual stock return is below -19% . We include this indicator and its interaction with *Pledge dummy* (or *Pledge ratio*) as shown by [Eq. \(5\)](#).

The first two columns of [Table 5](#) present the regression results based on this specification. We find that the estimated coefficients of the interaction terms are positive and significantly different from zero, indicating that pledging firms facing high margin call pressure are more likely to initiate M&As. To relieve endogeneity concerns, we use the 2SRI approach to conduct the IV estimations.¹⁵ Column (3) of [Table 5](#) presents the second-stage probit regression results by including the first-stage residual and other control variables. It confirms that the positive impact of share pledging on M&A propensity is more pronounced for firms under high margin call pressure. For robustness checks, we use -15% and -25% as alternative thresholds and re-examine the effects of the margin call pressure. Columns (4)–(9) of [Table 5](#) report the results using different thresholds for the margin call pressure. The coefficients on the interaction terms continue to be significantly positive, supporting [Hypothesis 2](#).

¹² The guidance states that companies should set an upper limit for their pledge ratio to control risk. In 2018, the upper limit was specified as 30%.

¹³ The pledge ratio is a continuous variable. It has enough variation to capture the impact of the policy after 2013. While the pledge dummy is a discrete variable, insufficient variation may affect the accuracy of our IV estimation; hence, we only employ the 2013 regulation change to instrument for pledge ratio.

¹⁴ See [The Guidance on the Administration of Stock Pledged Loans by Securities Companies](#). <https://neris.csrc.gov.cn/falvfagui/rdqsHeader/mainbody?navbarId=1&secFutrsLawId=27af15cd02c74a87a3d34db8e111d368>

¹⁵ Here, *Pledge ratio* and its interaction with *High margin call pressure* are both endogenous. Correspondingly, we use IVs and their interactions with *High margin call pressure* to estimate the two endogenous variables in the first-stage regression.

Table 4
Effects of share pledges on M&A propensity: controlling for endogeneity concerns.

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
	2SRI regression			Two-staged probit regression		
	First-stage	Second-stage		First-stage	Second-stage	
	<i>Pledge ratio</i>	<i>M&A dummy</i>		<i>Pledge ratio</i>	<i>M&A dummy</i>	
	Coefficients	Coefficients	Average marginal effects	Coefficients	Coefficients	Average marginal effects
<i>After2013</i> × <i>Treated</i>	-0.438 *** (0.036)			-0.087 *** (0.020)		
<i>After2013</i>	0.941 *** (0.053)			0.363 *** (0.020)		
<i>Treated</i>	1.059 *** (0.031)			0.523 *** (0.016)		
<i>Pledge ratio</i>		0.478 *** (0.065)	0.092 *** (0.012)		0.639 *** (0.099)	0.123 *** (0.020)
First stage residual		0.471 *** (0.059)	0.090 *** (0.011)			
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8063	8063	8063	8063	8063	8063

Notes: This table reports the benchmark results using an IV approach. *After2013* is a dummy that equals one for years since 2013, and zero otherwise. *Treated* is a dummy that equals one if the share pledge ratio is above the sample mean in 2012, and zero otherwise. Columns (1)–(3) report the two-stage regressions using the two-stage residual inclusion estimation proposed by Terza et al. (2008). In the first stage, we run a tobit regression of *Pledge ratio* on IVs (column (1)). In the second stage, we run a probit regression on the endogenous variable, the first-stage residual and control variables (column (2)). Column 3 reports the corresponding average marginal effects for the second stage. In columns (4)–(6), we use the two-staged probit regression as a robustness check. Column (4) reports the first-stage probit regression result where the dependent variable is *Pledge ratio*. Columns (5) and (6) present the second-stage results and the estimated average marginal effects. All regressions in this table control for a set of firm characteristic variables included in Table 3. All independent and control variables are measured prior to the given year, and all continuous variables are winsorized at the top and bottom 1% level. Standard errors are robust and clustered over firms and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

While analyses based on annual stock returns can help capture the margin call pressure, higher frequency data may provide further evidence. Using quarterly data, we employ changes in quarterly stock returns to measure the margin call pressure. Similar to Table 5, we use multiple thresholds as proxies for margin call pressure and construct an indicator based on whether the quarterly returns are below a certain threshold. Table 6 presents the results. Throughout various specifications, the coefficients on the interaction between *Pledge dummy (ratio)* with *High margin call pressure* are positive and statistically significant. These results reinforce the findings based on annual stock returns.

The control rights motive is based on the assumption that controlling shareholders face the threat of losing control when they pledge shares. If losing control rights is unlikely, we expect to observe a weaker link between share pledges and M&A initiation. We test this using the sample of SOEs, which we exclude from our baseline estimations. Shareholders of SOEs are allowed to pledge stocks, but there are strict restrictions on selling state-owned shares, even when pledgers fail to meet the margin call. There are two methods used when the pledged stocks for SOEs cannot meet margin requirements, which include transfer by agreement or auction in court. Equity transfer agreements are reported to the *State-owned Assets Supervision and Administration Commission* or the *Department of Finance* for approval. The court auction of state-owned stocks has much stricter restrictions on bid prices, bidders, and auction procedures compared with those for privately owned stocks.¹⁶ Overall, when the controlling shareholders of the SOEs pledge shares, the risk of losing control should be rather low.

Columns (1)–(3) of Table 7 report the regression results using the SOE sample. We show that the M&A propensity of SOEs cannot be

¹⁶ For example, reservation price is compulsory in a state-owned stock auction. If the highest bid price is lower than the reservation price, a second auction is conducted. The reservation price of each auction is not lower than 90% of the previous reservation price. If the highest bid price in the third auction does not reach the reservation price, the auction of state-owned shares is suspended.

explained by share pledging. The estimated coefficients from probit and 2SRI estimations are not statistically different from zero. This out-of-sample test further supports the control rights motive as the cause for the link between share pledging and M&As. In columns (4) and (5) of Table 7, based on the full sample including SOEs and non-SOEs, we interact the SOE indicator with *Pledge dummy (or Pledge ratio)* and re-estimate the probit model as in Table 3. The regression results suggest that the positive relationship between share pledge and M&A propensity is driven by non-SOEs. The M&A probability of SOEs is barely affected by share pledging. This finding still holds after we control for endogeneity using the 2SRI approach (column (6) of Table 7).

If the controlling shareholder owns significantly more shares than other large shareholders, their concern about losing control should be lower and the effect of share pledging on M&A activity should be weaker. To test this hypothesis, we first calculate the proportion of shares held by the controlling shareholder relative to the other top-nine shareholders. We then construct a dummy variable *High Risk* that equals one if this proportion is below the sample median, and zero otherwise. In Appendix Table B3, we interact this indicator with *Pledge dummy (or Pledge ratio)*, and include the interaction in regressions. The results show that the positive relationship between share pledging and M&A probability is more profound when controlling shareholders face a higher risk of losing control rights, providing additional evidence in support of Hypothesis 2.

4.2.2. Timing of M&A announcements

We find that pledging firms are more likely to initiate M&As, particularly when pledging controlling shareholders face margin call pressure. One explanation is that the firm already has plans to purchase the target, but margin call pressure accelerates such decision. A second explanation is that the firm has no prior plan to purchase the target and initiates a new M&A under pressure. We examine this issue in this section.

Specifically, we plot the monthly probability of initiating an M&A against the potential margin call pressure. If the stock price for a pledging firm drops more than 19% in a given month, we assume that

Table 5
Margin call pressure and M&A initiation: evidence based on annual data^a.

Dep. Var.: M&A dummy	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Margin call pressure measured by – 19%			Margin call pressure measured by – 15%			Margin call pressure measured by – 25%		
	Probit		2SRI	Probit		2SRI	Probit		2SRI
<i>Pledge dummy</i> × <i>High margin call pressure</i>	0.181 ** (0.086)			0.189 ** (0.084)			0.178 * (0.092)		
<i>Pledge ratio</i> × <i>High margin call pressure</i>		0.320 *** (0.101)	0.340 *** (0.103)		0.305 *** (0.099)	0.313 *** (0.101)		0.345 *** (0.106)	0.355 *** (0.108)
<i>Pledge dummy</i>	0.229 *** (0.047)			0.221 *** (0.049)			0.238 *** (0.046)		
<i>Pledge ratio</i>		0.375 *** (0.060)	0.383 *** (0.072)		0.371 *** (0.061)	0.378 *** (0.073)		0.384 *** (0.058)	0.392 *** (0.071)
<i>High margin call pressure</i>	-0.289 *** (0.077)	-0.309 *** (0.069)	-0.441 *** (0.130)	-0.330 *** (0.076)	-0.340 *** (0.068)	-0.382 *** (0.125)	-0.288 *** (0.083)	-0.328 *** (0.073)	-0.380 *** (0.143)
<i>Cash flow rights</i>	-0.003 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.003 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.003 (0.002)	-0.002 (0.002)	-0.002 (0.002)
<i>Ln (asset)</i>	-0.131 *** (0.027)	-0.138 *** (0.027)	-0.140 *** (0.027)	-0.129 *** (0.027)	-0.135 *** (0.027)	-0.136 *** (0.027)	-0.132 *** (0.027)	-0.138 *** (0.027)	-0.139 *** (0.027)
<i>ROA</i>	-0.022 *** (0.006)	-0.021 *** (0.006)	-0.021 *** (0.006)	-0.022 *** (0.006)	-0.022 *** (0.006)	-0.022 *** (0.006)	-0.022 *** (0.006)	-0.021 *** (0.006)	-0.021 *** (0.006)
<i>Leverage</i>	0.003 ** (0.001)	0.002 ** (0.001)	0.002 * (0.001)	0.003 ** (0.001)	0.002 ** (0.001)	0.002 * (0.001)	0.003 ** (0.001)	0.002 ** (0.001)	0.002 * (0.001)
<i>Sales growth rate</i>	0.001 ** (0.000)	0.001 ** (0.000)	0.001 ** (0.000)	0.001 ** (0.000)	0.001 ** (0.000)	0.001 ** (0.000)	0.001 ** (0.000)	0.001 ** (0.000)	0.001 ** (0.000)
<i>Age</i>	0.002 (0.004)	-0.001 (0.004)	-0.001 (0.004)	0.002 (0.004)	-0.001 (0.004)	-0.001 (0.004)	0.002 (0.004)	-0.001 (0.004)	-0.001 (0.004)
<i>EPS</i>	-0.132 (0.082)	-0.096 (0.083)	-0.086 (0.085)	-0.134 (0.082)	-0.097 (0.083)	-0.092 (0.085)	-0.130 (0.082)	-0.095 (0.083)	-0.089 (0.085)
<i>MB</i>	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)
<i>OCF generation</i>	-0.002 (0.091)	0.004 (0.090)	0.004 (0.090)	-0.003 (0.091)	0.003 (0.090)	0.004 (0.090)	-0.007 (0.091)	0.001 (0.090)	0.001 (0.090)
<i>Net profit margin</i>	0.004 ** (0.002)	0.004 ** (0.002)	0.004 ** (0.002)	0.004 ** (0.002)	0.004 ** (0.002)	0.004 ** (0.002)	0.004 ** (0.002)	0.004 ** (0.002)	0.004 ** (0.002)
<i>Institutional share</i>	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
<i>FCF</i>	0.049 (0.037)	0.048 (0.037)	0.048 (0.037)	0.049 (0.037)	0.047 (0.037)	0.048 (0.037)	0.051 (0.038)	0.048 (0.037)	0.048 (0.037)
<i>Past stock returns</i>	-0.188 *** (0.039)	-0.189 *** (0.039)	-0.187 *** (0.039)	-0.191 *** (0.039)	-0.191 *** (0.039)	-0.191 *** (0.039)	-0.187 *** (0.039)	-0.189 *** (0.039)	-0.188 *** (0.039)
<i>Voting rights</i>	0.006 ** (0.002)	0.006 *** (0.002)	0.006 *** (0.002)	0.005 ** (0.002)	0.006 *** (0.002)	0.006 *** (0.002)	0.005 ** (0.002)	0.006 *** (0.002)	0.006 *** (0.002)
First stage residual			Yes			Yes			Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8042	8042	8042	8042	8042	8042	8042	8042	8042

Notes: In this table, we examine how margin call pressure impacts the relationship between share pledges and M&A initiations using annual data. We use three thresholds, they are – 19%, – 15% and – 25%, to measure the margin call pressure. *High margin call pressure* is a dummy that equals one if the annual stock return is below the threshold. Columns (1)-(3), columns (4)-(6) and columns (7)-(9) report the regression results using annual stock returns below – 19%, – 15% and – 25% as the threshold for margin call pressure, respectively. Columns (1), (2), (4), (5), (7) and (8) report the estimated coefficients of probit regressions. Note that *Pledge ratio* and its interaction with *High margin call pressure* are both endogenous. Thus, we use IVs and their interactions with *High margin call pressure* to estimate the two endogenous variables in the first-stage regression. Columns (3), (6) and (9) report the estimated coefficients of the second stage in the 2SRI model. All regressions include control variables as in our baseline estimations. Standard errors are robust and clustered over firms, and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

^a We report the estimated coefficients in all columns. The average marginal effects of the interaction terms in columns (1)-(9) are 0.035 **, 0.061 ***, 0.065 ***, 0.037 **, 0.058 ***, 0.060 ***, 0.034 **, 0.066 ***, and 0.068 *** respectively.

the firm is under high margin call pressure and set that month as month 0. Pledging firms that do not experience monthly losses greater than – 19% are considered as the low margin call pressure group. Firms without pledging controlling shareholders are in the non-pledging group. M&A probability is calculated for each subgroup during each relative month as the number of firms that announce at least one M&A divided by the total number of firms in that relative month. For low margin call pressure and non-pledging groups, we plot the sample average M&A probability around month 0. The results are reported in Fig. 1.

As shown in Fig. 1, pledging firms with high and low margin call pressure have higher M&A probability than non-pledging firms. Interestingly, the M&A probability for pledging firms with high margin call pressure almost doubles in month – 1 and is about 150% higher in

month 0, compared with pledging firms with low margin call pressure. Meanwhile, the M&A probability for the high margin call group drops to almost 0 in month 1 and remains lower than that of the low margin call in months 2–4. Further analysis shows that the average monthly M&A probability for the high margin call group from month – 5 to month + 5 is 0.615%, which is almost identical to the average M&A probability for the low margin call pressure group (0.613%). These results suggest that instead of announcing new M&A deals, pledging firms facing margin call pressure are merely accelerating M&A deals that are already planned.

We re-plot the figure using – 15% and – 25% as the threshold for margin call pressure (see Panel A and Panel B in Appendix C), and obtain a pattern that is similar to that in Fig. 1. To alleviate the concern that differences in firm fundamentals drive our results, we re-plot the figure with a matched sample (see Panel C in Appendix C). The pattern remains

Table 6
Margin call pressure and M&A initiation: evidence based on quarterly data^a.

Dep. Var.: M&A dummy	(1) Margin call pressure measured by – 19%			(2) Margin call pressure measured by – 15%			(3) Margin call pressure measured by – 25%		
	Probit	2SRI		Probit	2SRI		Probit	2SRI	
<i>Pledge dummy</i> × <i>High margin call pressure</i>	0.174 * (0.104)			0.168 * (0.095)			0.201 * (0.123)		
<i>Pledge ratio</i> × <i>High margin call pressure</i>		0.193 *** (0.025)	0.212 *** (0.027)		0.126 *** (0.024)	0.288 *** (0.025)		0.367 ** (0.143)	0.424 ** (0.194)
<i>Pledge dummy</i>	0.154 *** (0.044)			0.186 *** (0.045)			0.198 *** (0.043)		
<i>Pledge ratio</i>		0.254 * (0.135)	0.273 * (0.143)		0.283 ** (0.145)	0.239 * (0.145)		0.234 * (0.133)	0.247 * (0.141)
<i>High margin call pressure</i>	-0.135 * (0.075)	-0.051 (0.089)	-0.073 (0.232)	-0.157 ** (0.071)	-0.045 (0.081)	-0.299 (0.233)	-0.144 (0.097)	-0.035 (0.101)	-0.101 (0.303)
<i>Cash flow rights</i>	0.001 (0.003)	0.001 (0.003)	0.000 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)	0.000 (0.003)
<i>Ln (asset)</i>	-0.043 (0.042)	-0.040 (0.041)	-0.029 (0.045)	-0.043 (0.042)	-0.037 (0.041)	-0.028 (0.045)	-0.036 (0.042)	-0.039 (0.042)	-0.032 (0.045)
<i>ROA</i>	-2.616 * (1.381)	-2.709 ** (1.373)	-2.378 * (1.381)	-2.616 * (1.381)	-2.618 * (1.369)	-2.378 * (1.382)	-2.637 * (1.372)	-2.531 * (1.382)	-2.314 * (1.394)
<i>Leverage</i>	0.087 (0.188)	0.079 (0.189)	0.062 (0.198)	0.087 (0.188)	0.096 (0.188)	0.047 (0.199)	0.093 (0.190)	0.105 (0.189)	0.068 (0.201)
<i>Sales growth rate</i>	0.005 (0.041)	0.004 (0.041)	-0.000 (0.041)	0.005 (0.041)	0.005 (0.041)	-0.001 (0.041)	0.005 (0.041)	0.005 (0.041)	-0.000 (0.041)
<i>Age</i>	0.008 (0.006)	0.008 (0.006)	0.008 (0.006)	0.008 (0.006)	0.007 (0.006)	0.008 (0.006)	0.007 (0.006)	0.007 (0.006)	0.008 (0.006)
<i>EPS</i>	0.016 (0.127)	0.017 (0.126)	0.042 (0.132)	0.016 (0.127)	0.012 (0.128)	0.043 (0.132)	0.013 (0.128)	0.009 (0.128)	0.041 (0.132)
<i>MB</i>	0.007 (0.009)	0.008 (0.009)	0.006 (0.009)	0.007 (0.009)	0.006 (0.009)	0.007 (0.009)	0.007 (0.009)	0.006 (0.009)	0.006 (0.009)
<i>OCF generation</i>	0.175 ** (0.076)	0.174 ** (0.076)	0.154 ** (0.066)	0.175 ** (0.076)	0.168 ** (0.074)	0.156 ** (0.066)	0.166 ** (0.074)	0.170 ** (0.075)	0.156 ** (0.066)
<i>Net profit margin</i>	0.150 (0.213)	0.164 (0.212)	0.053 (0.189)	0.150 (0.213)	0.169 (0.212)	0.057 (0.189)	0.168 (0.212)	0.162 (0.213)	0.048 (0.190)
<i>Institutional share</i>	0.008 * (0.004)	0.009 * (0.004)	0.009 ** (0.004)	0.008 * (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)	0.009 ** (0.004)
<i>FCF</i>	-0.054 ** (0.021)	-0.054 ** (0.021)	-0.043 ** (0.019)	-0.054 ** (0.021)	-0.052 ** (0.021)	-0.043 ** (0.019)	-0.051 ** (0.021)	-0.052 ** (0.021)	-0.043 ** (0.019)
<i>Past stock returns</i>	-0.096 * (0.054)	-0.101 * (0.054)	-0.106 * (0.056)	-0.096 * (0.054)	-0.096 * (0.054)	-0.105 * (0.057)	-0.099 * (0.054)	-0.092 * (0.054)	-0.103 * (0.056)
<i>Voting rights</i>	0.004 (0.003)	0.004 (0.003)	0.005 (0.003)	0.004 (0.003)	0.004 (0.003)	0.005 (0.003)	0.004 (0.003)	0.004 (0.003)	0.005 (0.003)
First stage residual			Yes			Yes			Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	32,033	32,033	32,033	32,033	32,033	32,033	32,033	32,033	32,033

Notes: In this table, we examine how margin call pressure impacts the relationship between share pledges and M&A initiations using quarterly data. We still use three thresholds, they are – 19%, – 15% and – 25%, to measure the margin call pressure. *High margin call pressure* is a dummy that equals one if the quarterly stock return is below the threshold. Columns (1)-(3), columns (4)-(6) and columns (7)-(9) report the regression results using quarterly stock returns below – 19%, – 15%, and – 25% as the threshold for margin call pressure, respectively. Columns (1), (2), (4), (5), (7) and (8) report the estimated coefficients of probit regressions. Columns (3), (6) and (9) report the estimated coefficients of the second stage in the 2SRI model. All regressions include control variables as in our baseline estimations. Standard errors are robust and clustered over firms, and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

^a The average marginal effects of the interaction terms in columns (1)-(9) are 0.002 **, 0.002 ***, 0.003 **, 0.003 *, 0.001 ***, 0.003 **, 0.004 *, 0.005 * and 0.005 **, respectively.

unchanged. Overall, these findings suggest that firms are likely to accelerate pre-existing M&A plans to boost stock prices when facing margin calls.

4.2.3. Alternative explanations

When controlling shareholders pledge shares, they transfer cash flow rights to pledgees while maintaining voting rights. This action aggravates the divergence between controlling shareholders' cash flow and voting rights, resulting in a potentially severe agency problem. Therefore, it is possible that share pledging increases controlling shareholders' incentives for expropriation and leads to self-serving acquisitions.

Related-party transactions are widely recognized as a means of

expropriation and tunneling by controlling shareholders (Bae et al., 2002). Large shareholders can seize private benefits through related-party M&A deals.¹⁷ If aggravated expropriation explains the link between share pledging and M&A propensity, we expect pledging firms to have a greater tendency to engage in related-party acquisitions. To test this conjecture, we construct a *Relevance dummy* that equals one if an M&A deal is a related-party transaction and zero otherwise.¹⁸ We then use this dummy as the outcome variable in Eq. (6). Columns (1) and (2) in Table 8 show that the estimated coefficients on *Pledge dummy* and *Pledge ratio* are both insignificant, indicating that share pledging does not lead to a higher tendency to conduct related-party acquisitions.

¹⁷ The most common approach is to buy high and sell low. For instance, in a related-party takeover, controlling shareholders may overpay for the target.

¹⁸ About 35% of the M&As in our sample are related-party transactions.

Table 7
The role of state-owned ownership.

Dep. Var.: <i>M&A dummy</i>	(1)	(2)	(3)	(4)	(5)	(6)
	Sub-sample for SOEs			Full sample for SOEs and non-SOEs		
	Probit		2SRI	Probit		2SRI
<i>Pledge dummy</i>	-0.027 (0.076)			0.295 *** (0.039)		
<i>Pledge ratio</i>		-0.006 (0.150)	0.017 (0.170)		0.480 *** (0.048)	0.457 *** (0.067)
<i>Pledge dummy</i> × <i>SOE</i>				-0.289 *** (0.081)		
<i>Pledge ratio</i> × <i>SOE</i>					-0.429 *** (0.149)	-0.444 *** (0.149)
<i>SOE</i>				-0.169 *** (0.048)	-0.147 *** (0.046)	0.160 * (0.084)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
First-stage residual			Yes			Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5659	5659	5659	13,722	13,722	13,722

Notes: In this table, we examine the role of state-owned ownership. The dependent variable is *M&A dummy*. Columns (1)-(3) report regression results of *M&A dummy* on share pledge variables using a sub-sample for SOEs. Columns (1)-(2) report the estimated coefficients of the probit model, and column (3) reports estimated coefficients of the second stage in the 2SRI model. In columns (4)-(6), we include the interaction of *pledge dummy*(*ratio*) with the *SOE* indicator in the regression. Columns (4) and (5) report the estimated coefficients of the probit model, and column (6) reports the estimated coefficients of the second stage in 2SRI model. All regressions include control variables as in the baseline regressions. Standard errors are robust and clustered over firms, and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

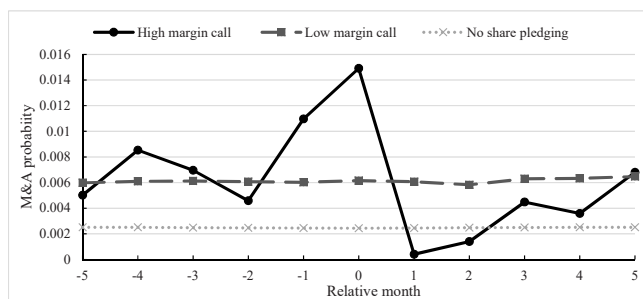


Fig. 1. Margin call pressure and the timing of M&A announcements. Notes: This figure plots the monthly M&A probability in relation to potential margin call pressure. If the stock price for a pledging firm drops more than -19% in a certain month, we regard the firm as facing high margin call pressure, and that month is set to be month 0. Firms with pledging but without experiencing monthly losses greater than -19% are in the low margin call pressure group. For each group and relative time period, M&A probability is calculated as the number of firms that announced at least one M&A in a month divided by the total number of firms this month. For the low margin call pressure group and non-pledging group, we plot the sample average M&A probability in month 0, and the relative lag and forward values.

The aggravated-expropriation hypothesis also predicts that controlling shareholders tend to overpay in M&A deals. Therefore, we examine the relationship between share pledges and the takeover premium. The takeover premium is calculated as the value acquirers pay to sellers divided by the estimated value of the target minus one.¹⁹ Columns (3) and (4) in Table 8 report the estimation results. We observe no evidence of overpayment for firms that pledge shares or those with higher share-pledge ratios. This finding is inconsistent with the aggravated-expropriation hypothesis.

If M&As are motivated by expropriation, we should expect to see poorer post-acquisition performance on the part of the acquirer. Following Field and Mkrtychyan (2017), we use changes in industry-median-adjusted ROA to proxy for post-acquisition performance. We

¹⁹ The estimated value is provided by investment banks or property assessment companies.

Table 8
Alternative explanation: aggravated expropriation hypothesis.

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Relevance dummy</i>		<i>Takeover premium</i>	<i>Changes in operating performance</i>		
<i>Pledge dummy</i>	-0.024 (0.081)		0.0004 (0.006)		-0.003 (0.016)	
<i>Pledge ratio</i>		0.008 (0.094)		0.011 (0.008)		-0.009 (0.015)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1354	1354	1100	1100	1069	1069

Notes: This table reports the impact of share pledges on related-party M&As, takeover premium, and post-acquisition operating performance. *Relevance dummy* equals one if the M&A deal is a related-party transaction, and zero otherwise. *Takeover premium* equals the value acquirers paid divided by the estimated value minus one. *Changes in operating performance* is computed as changes in industry-median-adjusted ROA from one year before and after deal completion. All regressions include control variables as in the baseline regressions. Standard errors are robust and clustered over firms, and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

compute the changes in industry-median-adjusted ROA from one year before and after deals were completed. In columns (5) and (6) in Table 8, we regress the changes in industry-adjusted ROA on *Pledge dummy* and *Pledge ratio*. Neither of the estimated coefficients in these two columns statistically differ from zero, providing further evidence against the aggravated-expropriation hypothesis.

Alternatively, our baseline results may be explained by controlling shareholder optimism about firms' future performance. If a controlling shareholder believes the firm's stock price would rise and a margin call is unlikely, she should be more inclined to pledge shares. Indeed, it has been demonstrated that firms controlled by optimistic insiders have a higher propensity to initiate M&As (Ferris et al., 2013; Malmendier and Tate, 2008). Therefore, optimism could be a common driver for share pledging and takeovers. To test whether our results are driven by optimism, we first use the change in controlling shareholder's cash flow

Table 9
Does optimism matter?.

Dep. Var.: M&A dummy	(1)	(2)	(3)	(4)	(5)	(6)
	Optimistic measured by changes in controlling shareholders' cash flow rights			Optimistic measured by attitude in performance forecast reports		
	Probit	2SRI		Probit	2SRI	
<i>Pledge dummy</i> × <i>Optimistic</i>	-0.051 (0.091)			-0.177 (0.115)		
<i>Pledge dummy</i>	0.292 * ** (0.046)			0.629 * ** (0.096)		
<i>Pledge ratio</i> × <i>Optimistic</i>		-0.057 (0.108)	-0.059 (0.107)		-0.124 (0.094)	-0.177 (0.115)
<i>Pledge ratio</i>		0.493 * ** (0.058)	0.491 * ** (0.072)		0.356 * ** (0.080)	0.636 * ** (0.111)
<i>Optimistic</i>	0.079 (0.074)	0.065 (0.066)	0.187 (0.120)	0.098 (0.067)	0.087 (0.075)	0.128 (0.112)
First-stage residuals			Yes			Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7948	7948	7948	6004	6004	6004

Notes: In this table, we investigate whether our main results are driven by optimism. In columns (1)–(3), *Optimistic* is a dummy variable that equals one if a controlling shareholder increases his cashflow rights in year t , and 0 otherwise. In columns (4)–(6), *Optimistic* equals one if a firm in year t forecasts its earnings per share (EPS) to increase over last year, or to continue to earn profits, or to turn a loss into profit, and zero otherwise. Columns (1), (2), (4) and (5) report the estimated coefficients of probit regressions. Columns (3) and (6) report the estimated coefficients of the second stage in the 2SRI model. All regressions include control variables as in the baseline regressions. Standard errors are robust and clustered over firms and are reported in parentheses. * **, * *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

rights as a proxy for optimism (Malmendier and Tate, 2005). A controlling shareholder who increases cash flow rights should be optimistic about the company's future performance, and vice versa. Therefore, we construct a dummy variable *Optimistic* that equals one if a controlling shareholder increases cash flow rights during year t and zero otherwise. We then include the interaction between *Optimistic* and the share-pledge variables in regressions. Columns (1)–(3) of Table 9 present the results. The estimated coefficients on the interaction terms are all statistically insignificant, which suggests that optimism is unlikely to simultaneously drive share pledging and M&As. As a robustness check, we utilize the tone in the performance forecast report released by the firm as an alternative measurement of whether the controlling shareholder is optimistic about the firm's future (Hribar and Yang, 2016). We obtain the forecast reports from the CSMAR database, and construct a dummy that equals one if a firm in year t forecasts its earnings per share (EPS) to increase over last year, or to continue to earn profits, or to turn a loss into profit. Columns (4)–(6) of Table 9 present the results using this alternative measure for optimism. Again, we find that optimism does not explain the link between share pledging and M&As.

4.2.4. Further evidence

4.2.4.1. a. Trading suspension. Listed firms can apply for trading suspension during major asset restructuring. Trading suspension can temporarily stop further dips in stock price, and controlling shareholders can use the suspension time to find ways to alleviate the margin call pressure. As in Hypothesis 3, we hypothesize that pledging firms should apply for longer trading suspensions following M&A announcements, particularly when they are under high margin call pressure. To test this hypothesis, we use the natural logarithm of the number of suspension days as the dependent variable in Eq. (5), based on the deal-level data. Similar to Table 5, we construct an indicator for high margin call pressure based on whether a firm's annual stock returns are below or above a certain threshold (−19%, −15%, or −25%). Table 10 reports the regression results. The point estimates on the interaction terms are positive and statistically significant, suggesting that pledging firms under high margin call pressure experience longer M&A-related suspension days on average, which lends support to Hypothesis 3.

4.2.4.2. b. Success rate of announced M&A deals. In Section 4.2.2, we demonstrate that pledging firms facing margin call pressure initiate M&As to boost stock prices, and such M&As may be announced hastily. If these deals are less prepared, we predict that M&A deals announced by pledging firms are less likely to succeed (Hypothesis 4).

To formally test Hypothesis 4, we first conduct a univariate analysis of the M&A success rate for pledging and non-pledging firms. As shown in Panel A of Table 11, the success rate of M&As initiated by pledging firms is 69.2%, which is 5.2% lower than those initiated by non-pledging firms and the difference is statistically significant. However, this only holds for the subsample of firms with significant stock price drops.²⁰ We next construct an indicator *Success*, which equals one if a deal is completed successfully and zero otherwise. We then use this variable as the outcome variable and estimate Eq. (5) based on the deal-level data. Panel B of Table 11 presents the results, showing that the coefficient of the interaction term is significantly negative. This suggests that M&As initiated by pledging firms under high margin call pressure tend to have a lower success rate compared with those initiated by non-pledging firms. Specifically, the M&A success rate for pledging firms under high margin call pressure is 12–18% lower than that for firms under low margin call pressure, depending on how we measure the margin call pressure threshold. Overall, these results indicate that M&A deals announced by pledging firms, particularly those facing margin call pressure, are more likely to fail.

4.2.4.3. c. CSRC inquiry. To further investigate our claim that pledging firms hastily announce M&As when under margin call pressure, we examine the number of days that firms take to reply to CSRC inquiries about the deals. When the CSRC has questions concerning an announced M&A, such as abnormal M&A goodwill or pricing fairness, it will issue an inquiry letter and demand the acquirer to reply timely. If the M&A is prematurely announced to fend off margin call pressure, we hypothesize that the firm would need more time to reply to CSRC's inquiry since such M&A deals are hastily prepared.

We obtain the inquiry response data from the Chinese Research Data

²⁰ Here, we split the M&A sample into two subsamples based on whether annual stock returns are below or above −19%. Univariate analysis is consistent under different margin call thresholds.

Table 10
Share pledges and trading suspension.

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.: <i>Ln (suspension days)</i>	Margin call pressure measured by – 19%		Margin call pressure measured by – 15%		Margin call pressure measured by – 25%	
<i>Pledge dummy</i> × <i>High margin call pressure</i>	0.220 ** (0.090)		0.195 (0.122)		0.236 ** (0.120)	
<i>Pledge ratio</i> × <i>High margin call pressure</i>		0.445 ** (0.208)		0.424 ** (0.206)		0.424 * (0.219)
<i>Pledge dummy</i>	-0.049 (0.105)		-0.044 (0.107)		-0.044 (0.102)	
<i>Pledge ratio</i>		0.034 (0.133)		0.032 (0.135)		0.059 (0.128)
<i>High margin call pressure</i>	-0.101 (0.183)	-0.164 (0.156)	-0.167 (0.178)	-0.234 (0.153)	-0.142 (0.195)	-0.189 (0.167)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1349	1349	1349	1349	1349	1349

Notes: This table analyzes how share pledges affect M&A suspension time under margin call pressure. We define the high margin call pressure based on whether the stock return is below – 19%, – 15% and – 25%. *High margin call pressure* is a dummy that equals one if the annual stock return is below the threshold. The dependent variable is the natural logarithm of the number of suspension days. All regressions include control variables as in the baseline regressions. Standard errors are robust and clustered over firms and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 11
Share pledge and M&A success rate.

Panel A: Univariate tests of M&A success rate					
			M&A success rate	Mean difference	p-value
Full sample	Pledging firms		0.692	-0.052 * *	0.045
	Non-pledging firms		0.744		
Stock returns less than – 19%	Pledging firms		0.537	-0.161 * **	0.003
	Non-pledging firms		0.698		
Stock returns more than – 19%	Pledging firms		0.768	0.003	0.867
	Non-pledging firms		0.765		

Panel B: Regression results of M&A success rate on the interaction of share pledge and margin call pressure ^a						
	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.: <i>Success</i>	Margin call pressure measured by – 19%		Margin call pressure measured by – 15%		Margin call pressure measured by – 25%	
<i>Pledge dummy</i> × <i>High margin call pressure</i>	-0.386 * (0.212)		-0.420 * (0.244)		-0.606 ** (0.270)	
<i>Pledge ratio</i> × <i>High margin call pressure</i>		-0.393 ** (0.205)		-0.456 * (0.267)		-0.587 ** (0.297)
<i>Pledge dummy</i>	0.007 (0.124)		0.022 (0.125)		0.038 (0.122)	
<i>Pledge ratio</i>		-0.159 (0.150)		-0.130 (0.152)		-0.130 (0.146)
<i>High margin call pressure</i>	-0.381 (0.237)	-0.479 ** (0.200)	-0.203 (0.226)	-0.297 (0.192)	-0.272 (0.248)	-0.438 ** (0.211)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	862	862	862	862	862	862

Notes: This table presents how share pledge affects the M&A success rate. Panel A reports the univariate analysis of the M&A success rate for pledging firms and non-pledging firms. Panel B reports the regression results of the M&A success rate on interactions of share pledges with high margin call pressure. We define the high margin call pressure based on whether the stock return is below – 19%, – 15% and – 25%. *High margin call pressure* is a dummy that equals one if the annual stock return is below the threshold. The dependent variable is a dummy that equals one if a deal is completed, and zero otherwise. All regressions in this table include control variables as in Table 3. All explanatory variables are measured in year t-1, and all continuous variables are winsorized at the 1st and 99th percentiles levels. Standard errors are robust and clustered over firms and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

^a The average marginal effects of the interaction terms in columns (1)-(6) are – 0.117 *, – 0.119 **, – 0.129 *, – 0.139 *, – 0.183 ** and – 0.177 **, respectively.

Service Platform (CNRDS).²¹ We then match the CSRC inquiries with M&A deals and calculate the number of days between the CSRC’s inquiry date and firms’ reply date. We use the number of days (*Days before replying to CSRC*) as the dependent variable in Eq. (5), where we also control for the interaction term *Pledge dummy (ratio) × High margin call*

pressure. We examine the effects of share pledging in the days before replying to CSRC, based on different thresholds for margin call pressure. As shown in Table 12, the coefficient on *Pledge dummy (ratio) × High margin call pressure* is positive and statistically significant in columns (1)–(4). These results suggest that pledging firms under high margin call pressure take more time to reply to CSRC inquiries, which is consistent with our conjecture that M&As were not well-prepared.

²¹ The data is available from 2015.

Table 12
Share pledge and number of days before replying to CSRC's inquiry.

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
<i>Days before replying to CSRC</i>	Margin call pressure measured by – 19%		Margin call pressure measured by – 15%		Margin call pressure measured by – 25%	
<i>Pledge dummy</i> × <i>High margin call pressure</i>	4.197 * (2.449)		4.460 * * (2.354)		3.391 (2.417)	
<i>Pledge ratio</i> × <i>High margin call pressure</i>		12.473 * * (5.308)		14.394 * * * (5.132)		8.914 (5.544)
<i>Pledge dummy</i>	1.396 (1.994)		1.143 (2.056)		1.947 (1.962)	
<i>Pledge ratio</i>		2.428 (2.547)		1.186 (2.641)		4.485 (2.865)
<i>High margin call pressure</i>	-1.551 (2.766)	-4.332 * (2.310)	-1.004 (2.831)	-4.579 * (2.389)	-4.894 * (2.798)	-6.802 * * * (2.353)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	433	433	433	433	433	433

Notes: In this table, we examine the relationship between share pledge and the number of days before replying to CSRC's inquiry when there is an M&A announcement. We calculate the number of days between the CSRC's inquiry date and the listed firm's reply date, and use the number of days (*Days before replying to CSRC*) as the dependent variable for this analysis. We define the high margin call pressure based on whether the stock return is below – 19%, – 15% and – 25%. *High margin call pressure* is a dummy that equals one if the annual stock return is below the threshold. All regressions include control variables as in the baseline regressions. Standard errors are robust and clustered over firms and are reported in parentheses. * * *, * *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 13
Market reaction to M&A announcement: univariate analysis.

Panel A: Univariate analysis for CARs and BHARs: pledging firms v.s. non-pledging firms												
Time window	(1)		(2)		(3)		(4)		(5)		(6)	
	Firms with share pledging		Firms without share pledging		Differences in mean		Differences in median		Differences in mean		Differences in median	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>CARs</i> (–2,+2)	0.056 * * (0.021)	0.050 * * * (0.000)	0.109 * * * (0.005)	0.090 * * * (0.000)	-0.053 * * * (0.003)	-0.040 * * * (0.001)						
<i>CARs</i> (–5,+10)	0.059 * * (0.032)	0.029 * * * (0.000)	0.130 * * (0.029)	0.076 * * * (0.000)	-0.071 * * * (0.005)	-0.037 * * * (0.002)						
<i>CARs</i> (–5,+20)	0.043 * * * (0.001)	0.025 * * * (0.000)	0.125 * * (0.027)	0.074 * * * (0.000)	-0.082 * * * (0.002)	-0.039 * * * (0.004)						
<i>CARs</i> (–5,+30)	0.035 * (0.070)	0.020 * * * (0.000)	0.113 * * (0.015)	0.093 * * * (0.000)	-0.078 * * * (0.007)	-0.063 * * * (0.000)						
<i>CARs</i> (–5,+40)	0.020 (0.102)	0.010 * * * (0.000)	0.110 * (0.097)	0.095 * * * (0.000)	-0.090 * * * (0.003)	-0.085 * * * (0.001)						
<i>CARs</i> (–5,+60)	0.006 (0.451)	0.009 * * * (0.000)	0.091 (0.134)	0.075 * * * (0.000)	-0.085 * * (0.032)	-0.066 * * * (0.005)						
	Mean	Median	Mean	Median								
<i>BHARs</i> (0,6Months)	-0.008 (0.127)	-0.008 * * * (0.000)	0.028 * * (0.031)	-0.005 * * * (0.000)	-0.036 * (0.075)	-0.003 (0.872)						
<i>BHARs</i> (0,12Months)	-0.000 (0.219)	-0.014 * * * (0.000)	0.025 (0.310)	-0.038 * * * (0.000)	-0.025 (0.710)	0.024 (0.825)						
<i>BHARs</i> (0,24Months)	-0.060 * (0.087)	-0.104 * * * (0.000)	-0.074 * (0.092)	-0.116 * * * (0.000)	0.014 (0.305)	0.012 (0.281)						
Panel B: Stock returns before M&A announcements and CARs for pledging firms												
Stock return of pledging firms before M&A announcements			M&A CARs of pledging firms									
Stock return (–30,–5)	-0.044		<i>CARs</i> (–5,+30)		0.035							
Stock return (–20,–5)	-0.033		<i>CARs</i> (–5,+20)		0.043							
Stock return (–10,–5)	-0.013		<i>CARs</i> (–5,+10)		0.059							

Notes: This table reports market reactions to M&A announcements. CARs are the cumulative abnormal returns based on the market model. BHARs are the buy-and-hold abnormal monthly returns adjusted by firm size and book-to-market ratio. Panel A reports summary statistics of M&A announcement returns over different event windows, and presents a univariate analysis of the median and mean of CARs and BHARs. In columns (1) and (3) of Panel A, we conduct the one-sample t-tests on the means of CARs and BHARs to compare whether the means are significantly different from zero. The p-values for the t-tests are reported in parentheses. In columns (2) and (4), we conduct the Wilcoxon signed-rank tests on the medians of CARs and BHARs to compare whether the medians are significantly different from 0. The associated p-values for the tests are reported in parentheses. In columns (5) and (6), we test whether the differences in the means and medians of CARs and BHARs between the two groups are significant, and the p-values for the tests are reported in parentheses. Panel B shows the comparison between stock returns before M&A announcements and CARs for pledging firms.

4.3. M&A announcement returns

How do investors react to M&A announcements by pledging firms? Hypothesis 5 argues that if investors anticipate a lower success rate for pledging firms, they will react less positively to such M&A

announcements. We test this hypothesis in this section.

We first estimate Eq. (1) during 11–150 trading days prior to the announcement, and then use the estimated parameters to calculate the CARs over different event windows based on Eq. (2). Panel A of Table 13 presents a univariate analysis of CARs and BHARs surrounding M&A

Table 14
Impacts of share pledging on M&A stock performance.

Dep. Var.:	(1)	(2)	(3)	(4)	(5)
	Short-term stock returns			Long-term stock returns for completed deals	
	Full sample	Completed deals	Incomplete deals		
	CARs (-2, +2)	CARs (-2, +2)	CARs (-2, +2)	BHARs (0,12Months)	BHARs (0, 24 Months)
<i>Pledge dummy</i>	-0.020 * *	-0.025	-0.039 *	-0.068	0.102
	(0.010)	(0.023)	(0.020)	(0.085)	(0.123)
<i>Ln (asset)</i>	-0.025 * **	-0.049 * **	-0.006	-0.170 * **	-0.315 * **
	(0.007)	(0.013)	(0.022)	(0.058)	(0.085)
<i>ROA</i>	0.062	0.156	-0.868 * **	-3.015 * **	-2.538 * **
	(0.079)	(0.130)	(0.217)	(0.648)	(0.941)
<i>Leverage</i>	0.083	0.093	-0.081	-0.288	-0.205
	(0.051)	(0.086)	(0.058)	(0.432)	(0.631)
<i>Sales growth rate</i>	0.005	0.013 * *	0.004	-0.033	-0.117 * *
	(0.004)	(0.006)	(0.023)	(0.032)	(0.047)
<i>Top1</i>	0.000	-0.002 * **	0.001	0.009 * *	0.015 * **
	(0.000)	(0.001)	(0.001)	(0.004)	(0.005)
<i>Indep</i>	0.185 *	0.329 *	0.185	-1.336 *	-0.319
	(0.102)	(0.184)	(0.145)	(0.805)	(1.167)
<i>Ln (Board)</i>	0.008	0.021 * **	-0.006	-0.134 * **	-0.182 * **
	(0.005)	(0.007)	(0.007)	(0.038)	(0.054)
<i>MA_dif_ind</i>	-0.012 * *	-0.022 * *	-0.032 * **	0.031	0.132 *
	(0.006)	(0.009)	(0.008)	(0.048)	(0.070)
<i>MA_dif_pro</i>	0.005	-0.001	0.019 * **	-0.056	-0.034
	(0.005)	(0.007)	(0.005)	(0.040)	(0.058)
<i>MA_related</i>	0.013 * *	0.028 * **	0.001	0.038	-0.015
	(0.005)	(0.007)	(0.006)	(0.042)	(0.061)
<i>MA_cash</i>	-0.008	-0.010	-0.005	-0.035	-0.002
	(0.007)	(0.010)	(0.009)	(0.054)	(0.079)
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Observations	1233	783	450	783	775

Notes: In this table, we examine how share pledges influence short-term and long-term M&A performance. Columns (1)–(3) report the regression results of CARs (-2, +2) on share pledges for full deals, completed deals and incomplete deals. Columns (4)–(5) report the regression results of 12-month and 24-month BHARs on share pledges for completed deals. We control for a set of firm-level and deal-level characteristics following [Zhu et al. \(2021\)](#). *Top1* is the percentage of shares held by the largest shareholder. *Indep* is the percentage of independent directors on the board. *Ln (Board)* is the natural logarithm of the number of directors on the board. *MA_dif_ind* is an indicator that equals one if firms and targets are from different industries. *MA_dif_pro* is an indicator that equals one if firms and targets are from different provinces. *MA_related* is an indicator that equals one if the M&A is a related-party transaction. *MA_cash* is an indicator that equals one if the deals using pure cash or a mixture of stock and cash for payment. Standard errors are robust and clustered over firms and are reported in parentheses. * **, * *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

announcements based on different event windows. We find a positive market reaction to M&A announcements for a typical firm in our sample. Nevertheless, the estimated CARs associated with M&A announcements by pledging firms appear to be much lower than those for non-pledging firms. For example, the five-day CARs (-2,+2) for pledging firms is 5.6%, which is roughly half of that of non-pledging firms. For pledging firms, this positive market reaction remains statistically significant for up to 40 days. In comparison, the positive market reaction lasts longer for non-pledging firms, remaining statistically significant after 60 days. The univariate analysis indicates that share pledging reduces M&A announcement returns. These results suggest that pledging firms can use M&A announcements to support the stock price, albeit to a lesser degree than non-pledging firms.

Regarding the long-term market reaction, size- and book-to-market-adjusted BHARs associated with M&A announcements of pledging firms are negative and once again lower than those of non-pledging firms. The differences in BHARs between pledging and non-pledging firms are statistically insignificant 12 months following the M&A announcement. It is worth noting that post-acquisition BHARs become more negative over time, implying that M&As do not improve the long-run performance of either pledging or non-pledging firms. This result is consistent with the extant literature ([Renneboog and Vansteenkiste, 2019](#)).

Panel B of [Table 13](#) indicates that pledging firms generally experience negative stock returns prior to M&A announcements. For example, the average stock return based on the (-30, -5) event window is around -4%. After 30 days, the estimated CARs are around 3.5%. Therefore, despite the lower CARs associated with M&As initiated by pledging

firms, the downward price pressure prior to M&A announcements is likely to be offset by positive announcement returns. This result indicates that it is an effective strategy to use M&A announcements to fend off margin call pressure.

We conduct further regression analysis on the impact of share pledging on CARs and BHARs. The results are reported in [Table 14](#). Columns (1)–(3) report the regression results in terms of CARs for all deals, completed deals, and incomplete deals, respectively. For incomplete deals, the five-day CARs are significantly lower for pledging firms than for non-pledging firms (column (3)). In contrast, the difference in five-day CARs is statistically insignificant for completed deals by pledging and non-pledging firms (column (2)). In columns (4) and (5) of [Table 14](#), we examine the effects of share pledging on post-deal BHARs for completed deals. The coefficient on *Pledge dummy* is statistically insignificant. These results suggest that investors recognize, at least to some extent, that pledging firms may merely use M&A announcements to support stock prices and that such deals may be less likely to succeed.

Note that our results contradict those reported by [Zhu et al. \(2021\)](#), who found M&A announcement CARs to be significantly larger for pledging firms than non-pledging firms, which is primarily attributed to two factors. First, [Zhu et al. \(2021\)](#) use a sample of M&A deals by Chinese listed firms during 2004–2016. Share pledging was not widespread

in China in the early years from 2004 to 2009.²² Share pledging has become more prevalent since 2010, particularly after the 2013 regulation change. The regulatory change made pledging more convenient and possibly induced firms of lower quality to engage in share pledging. Consistent with this conjecture, we find the frequency of margin call pressure to be higher for pledging firms after 2009, and the M&A deals announced by pledging firms since 2010 are less likely to succeed than those made during the earlier years.²³ Second, Zhu et al. (2021) only focus on completed deals. In contrast, we include both completed and incomplete deals in the estimations. As shown previously, M&As announced by pledging firms are less likely to succeed, which lowers the expected returns of such announcements.

5. Conclusions

While share pledging by controlling shareholders is a pervasive phenomenon, it can jeopardize shareholders' control rights. In the event of a margin call, controlling shareholders might lose control rights if they are unable to meet margin call requirements. To fend off the risk of losing control rights, controlling shareholders have strong incentives to support stock prices by manipulating corporate decisions.

We analyze how the pledging behavior of controlling shareholders affects firms' M&A decisions. Our results indicate that firms with controlling shareholders who pledge stocks are more likely to make acquisitions to support their stock prices, which generate positive stock returns in less-competitive capital markets. We also explore the possible mechanisms through which share pledging influences firms' M&A

decisions. We show that the control rights motive hypothesis best explains our findings, and rule out expropriation and optimism as alternative explanations.

In addition, we find that pledge-related M&A announcements have a higher probability of being withdrawn and are associated with longer trading suspension periods. Furthermore, firms with pledging controlling shareholders take more time to respond to the regulator's inquiry about the M&A deals. We also find the market reaction to pledge-related M&A announcements to be less favorable than that to other M&As. These findings are consistent with the hypothesis that controlling shareholders hastily announce M&A deals to support stock prices when they are under margin call pressure.

Our study extends the literature regarding the effects of share pledging on corporate decisions. We demonstrate that controlling shareholders' pledging behavior has a significant impact on firms' M&A decisions. Our study provides new angles to understand the motivation of and market reaction to M&A announcements. Our findings also add to the understanding of the M&A completion risk in less developed markets, which can help investors make better decisions. Overall, our study contributes to the discussion on corporate governance and policy regulations related to corporate merger and acquisitions, given the surge in share pledging in recent years.

Data Availability

We use licensed data from CNRDS, CSMAR, and WIND. The authors are able to share the data with the permission from these data providers.

Appendix A. Variable definitions

See Appendix Section here.

Category	Variables	Definition & Calculation
Dependent variables	<i>M&A dummy</i>	A dummy variable that equals one if the company has at least one merger and acquisition transaction reported in the major restructuring events section of the WIND database during a certain period, and zero otherwise.
	<i>Relevance dummy</i>	A dummy variable that equals one if the M&A is a related-party transaction, and zero otherwise.
	<i>Takeover premium</i>	The expense acquirers paid to the seller divided by the estimated value of the targets minus one.
	<i>Changes in operating performance</i>	Changes in industry-median-adjusted ROA (return on asset) between one year before and after the deal completion. The industry-median-adjusted ROA equals to a firm's ROA minus its 2-digit industry's median ROA.
	<i>Ln (suspension days)</i>	The natural logarithm of days between the first suspension and resumption after the M&A announcement.
	<i>Success</i>	A dummy variable that equals one if the M&A transaction succeeds, and zero otherwise.
	<i>Days before replying to CSRC</i>	The number of days before replying to CSRC's inquiry on an M&A announcement.
	<i>CARS</i>	The cumulative abnormal returns are computed based on the market model. First, we use returns over the estimation window to perform the following ordinary least squares (OLS) regression: $R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_i$ where R_{it} is the daily stock return (considering cash dividend reinvestment) of firm i , and R_{mt} represents the daily market index return (SSE index return for firms listed on Shanghai Stock Exchange and SZSE index return for firms listed on Shenzhen Stock Exchange). We obtain the estimated $\hat{\alpha}_i$ and $\hat{\beta}_i$ for each firm, and calculate the abnormal returns by subtracting the estimated normal returns ($\hat{\alpha}_i + \hat{\beta}_i R_{mt}$) from the actual returns during the event window. Finally, we accumulate the abnormal returns during the event window to obtain the cumulative abnormal returns (CARs) based on following equation: $CARS_i(-T, T) = \sum_{t=-T}^T [R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt})]$ where $(-T, T)$ indicates the event window, which starts from the T th trading day before the M&A announcement and ends on the T th day following the announcement.
	<i>BHARs</i>	Buy-and-hold abnormal returns are excess returns over the benchmark portfolio. Specifically, the size- and book-to-market ratio-adjusted BHARs of firm i within M months after the M&A announcements are calculated as follows: $BHARS_i(0, M) = \prod_{t=0}^M (1 + R_{it}) - \prod_{t=0}^M (1 + R_{pt})$ where R_{it} and R_{pt} represent the monthly stock return of acquirer i and the benchmark portfolio t months after the acquisition announcement. The benchmark portfolios consist of 25 size and book-to-market-sorted portfolios in the spirit of Fama and French (1992).

(continued on next page)

²² The proportion of firms (including SOEs and non-SOEs) with controlling shareholders pledging stocks was 22% during 2004–2009. This ratio increased to 40% during 2010–2018.

²³ The margin call pressure frequency for pledging firms before and after 2009 was 0.32 and 0.4, respectively. The success rate of M&A announcements was 0.94 for pledging firms during 2004–2009 and lowered to 0.73 during 2010–2018.

(continued)

Category	Variables	Definition & Calculation
Independent variables	<i>Pledge dummy</i>	A dummy variable that equals one if the controlling shareholder has share pledge recorded in the WIND database at the end of a certain period, and zero otherwise.
	<i>Pledge ratio</i>	The percentage of pledged shares in the total shareholdings by controlling shareholders.
Control variables	<i>Cash flow rights</i>	The percentage of shares owned by controlling shareholders to the total shares outstanding.
	<i>Ln (asset)</i>	The natural logarithm of total assets.
	<i>ROA</i>	Net profit divided by total assets.
	<i>Leverage</i>	The sum of current and non-current liabilities divided by total assets.
	<i>Sales growth rate</i>	Changes in sales over two years divided by lagged sales.
	<i>Age</i>	The number of years since a firm is established.
	<i>EPS</i>	Earnings per share, measured as net profit divided by total number of shares.
	<i>MB</i>	Stock price per share divided by net assets per share.
	<i>OCF generation</i>	Operating cash inflow divided by sales.
	<i>Net profit margin</i>	Net profit divided by sales.
	<i>Institutional share</i>	The percentage of shares owned by institutional investors to the total shares outstanding.
	<i>FCF</i>	Free cash flow scaled by sales, where the free cash flow = (earnings before interest, depreciation and amortization) - (change in working capital) - (capital expenditure).
	<i>Past stock returns</i>	The buy-and-hold abnormal return with the market index logarithmic return rate as the market return over a certain period.
	<i>Voting rights</i>	The percentage of the direct and indirect voting rights held by the controlling shareholders to the total shares outstanding.
	<i>Top1</i>	The percentage of shares held by the largest shareholder.
	<i>Indep</i>	The percentage of independent directors on the board.
	<i>Ln (Board)</i>	The natural logarithm of number of directors on the board.
Other variables	<i>MA_dif_ind</i>	A dummy variable that equals one if firms and targets are from different industries, and zero otherwise.
	<i>MA_dif_pro</i>	A dummy variable that equals one if firms and targets are from different provinces, and zero otherwise.
	<i>MA_related</i>	A dummy variable that equals one if the M&A is a related-party transaction, and zero otherwise.
	<i>MA_cash</i>	A dummy variable that equals one the deals using pure cash or a mixture of stock and cash for payment, and zero otherwise.
	<i>Treated</i>	A dummy variable that equals one if the share pledge ratio is above the sample mean in 2012, and zero otherwise.
	<i>After2013</i>	A dummy variable that equals one for years since 2013, and zero otherwise.
	<i>High margin call pressure</i>	An indicator for whether the annual/quarterly stock returns are below certain threshold.
	<i>High risk</i>	A dummy that equals one if the ratio of controlling shareholding relative to other top nine shareholding is below the median, and zero otherwise.
	<i>Optimistic</i>	A dummy that equals one if a controlling shareholder increase his cash flow rights in year t, and zero otherwise. OR A dummy that equals one if a firm in year t forecasts its earnings per share (EPS) to increase over last year, or to continue to earn profits, or to turn a loss into profit, and zero otherwise

Appendix B. Additional tables

See Appendix [Tables B1–B3](#) here.

Table B1
Sample selection process.

Selection criteria	# of observations for non-SOEs'	# of observations for SOEs'
	annual data	annual data
1. All Chinese A-share listed firms from 2010 to 2018. Data source: CSMAR database.	15,816	8053
2. Exclude firms without controlling shareholders	14,381	7840
3. Exclude firms in financial and public utility industries, and exclude firms that have been listed for less than one year	11,342	6570
4. Exclude observations with missing independent and control variables.	8063	5659

Notes: This table presents our sample selection process step by step. The first column lists the selection criteria. The second and third columns report the number of observations in non-SOEs and SOEs after each selection process.

Table B2
Share pledging and M&A propensity: robustness checks.

Dep. Var.: <i>M&A dummy</i>	(1) Fixed effects model	(2)	(3) "Within-group change" estimation	(4)
<i>Pledge dummy</i>	0.027 ** (0.013)		0.153 ** (0.079)	
<i>Pledge ratio</i>		0.064 *** (0.018)		0.418 *** (0.102)
Control variables	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	8063	8063	2244	2244

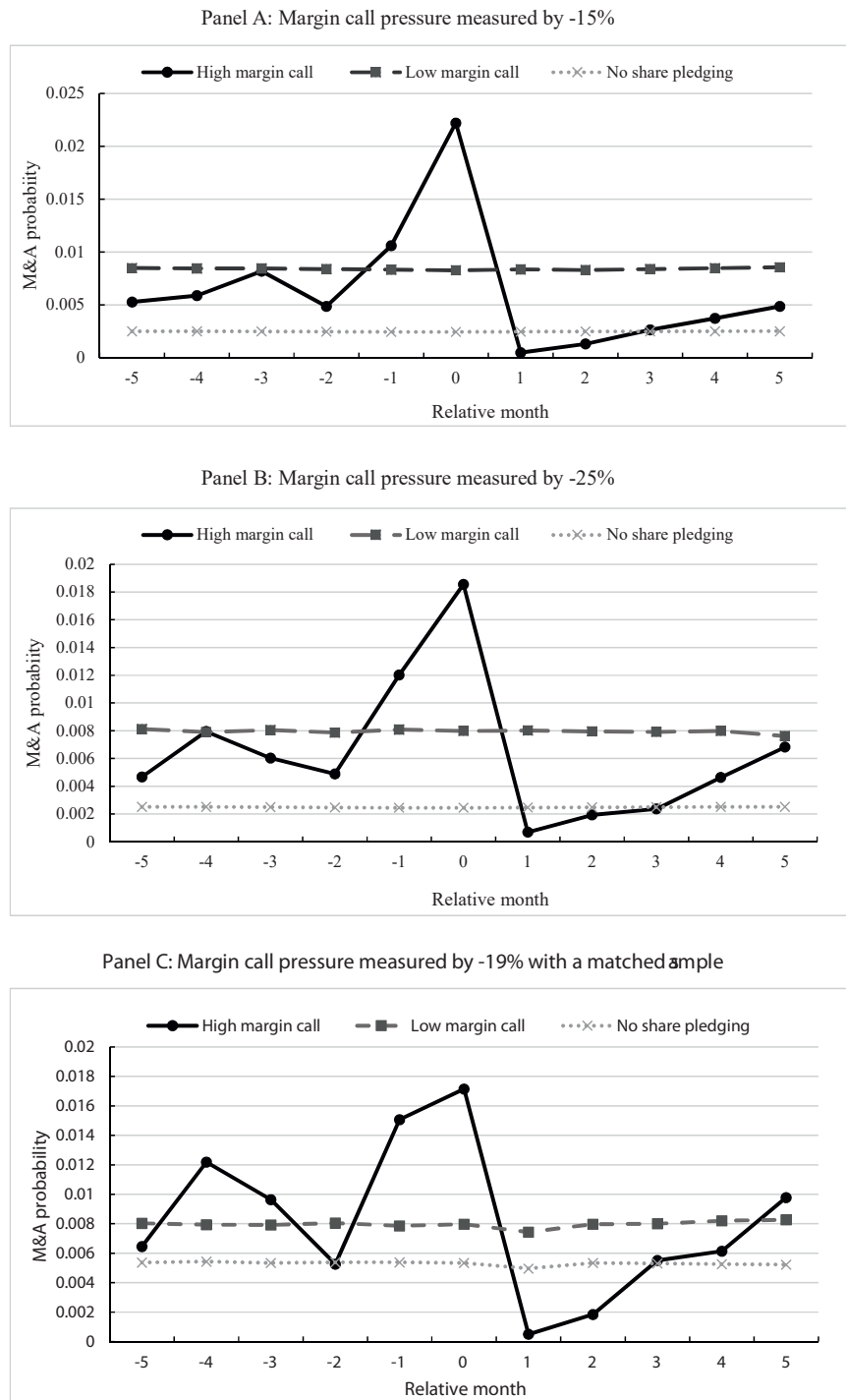
Notes: This table reports robustness checks on the baseline results in Table 3. Columns (1)-(2) report OLS regressions after controlling for firm fixed effects. Columns (3)-(4) report the "within-group change" of M&A propensity for pledging firms. In the "within-group change" estimation, we exclude firms that never pledged stocks during our sample period, and only keep firms that did not pledge stocks in the first two years and then pledged stock in the next two years. All regressions include control variables as in the baseline regressions. Standard errors are robust and clustered over firms and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B3
Risk of losing control and M&A initiation.

Dep. Var.: <i>M&A dummy</i>	(1)	(2)	(3)
<i>Pledge dummy</i> × <i>High risk</i>	Probit 0.140 * (0.079)		2SRI
<i>Pledge dummy</i>	0.196 *** (0.055)		
<i>Pledge ratio</i> × <i>High risk</i>		0.181 * (0.097)	0.175 * (0.097)
<i>Pledge ratio</i>		0.376 *** (0.069)	0.352 *** (0.085)
<i>High risk</i>	-0.147 ** (0.068)	-0.119 * (0.063)	-0.266 ** (0.103)
First-stage residual			Yes
Control variables	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	8030	8030	8030

Notes: In this table, we examine if the relationship between stock pledge and M&A initiation varies as the controlling shareholder's risk of losing control rights. We first calculate a ratio as shares held by the controlling shareholder divided by those held by other top-9 shareholders. Then, we construct a dummy (*High risk*) that equals one if this ratio is below the sample median, and zero otherwise. We add the interaction of *Pledge dummy(ratio)* and *High risk* into regressions, and control for a vector of firm characteristics variables included in Table 3. Columns (1)-(2) report the estimated coefficients of probit regression, and column (3) reports the estimated coefficients of the second-stage in 2SRI model. Standard errors are robust and clustered over firms and are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Appendix C. Additional figures



Notes: These figures plot the monthly probability of M&A announcements in relation to potential margin call pressure. Panel A uses a threshold of – 15% for margin call pressure, while Panel B uses a threshold of – 25%. In Panel C, we match pledging and non-pledging firms based on firm size, leverage, ROA, PB, sales growth rate, and EPS, using a one-to-one nearest neighbor propensity score matching approach. The threshold of margin call pressure in Panel C is – 19%. The specifications for these figures are the same as those in Fig. 1.

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