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Do Auditors Respond when Listed Firms Pledge Shares? Evidence from China

Abstract

Purpose

This paper investigates whether the audit fees of Chinese listed firms are associated with the share pledging practice of the firm's controlling shareholders.

Design/methodology/approach

This study employs the audit pricing model to estimate the association between the share pledging of listed firms and audit fees. Cross-sectional analysis is conducted on a large sample of Chinese listed firms during the period 2004 to 2019. We further test the moderating effects of listing on the Main Board, state ownership and abnormal audit report lag on the association between share pledging and audit fees. The results remain robust to various endogeneity tests including 2SLS instrumental variable analysis, entropy balancing analysis, and difference-in-difference analysis.

Findings

The study finds that audit fees are positively associated with the proportion of shares pledged by the listed firm's controlling shareholder in China. The results also provide new evidence that the positive association between audit fees and the share pledging of controlling shareholders could be mitigated if the firm is listed on the Main Board and/or it is a State-owned Enterprise (SOE). In contrast, pledged firms with abnormal audit report lag are found to have higher audit fees than their pledged counterparts without the excessively long audit delay.

Practical implications

Findings of this study have important practical implications to those charged with governance, as boards need to comprehensively understand the adverse consequences of share pledging when pursuing it as the firm's major source of financing. The study also has policy implications for stock market regulators such as the Chinese Securities Regulatory Commission (CSRC) in China. Regulators could consider developing a threshold-based share pledging disclosure and pledge ratio requirements based on factors such as a firm's listing status and ownership structure.

Originality/value

This study provides new evidence on the audit related consequences of share pledging in a significant capital market. Findings of this study also enrich the existing audit literature by introducing the share pledging activities of controlling shareholders into the audit pricing decision making model.

Key words: share pledging; audit fees; state ownership; Main Board listing; China

1. Introduction

This paper investigates whether the audit fees of Chinese listed firms are associated with the proportion of share pledging by the firm's controlling shareholder. The practice of share pledging is when a listed firm's shareholders use their own shares as collateral for a personal loan from financial institutions.

Prior literature has examined the consequences of the share pledging activities of controlling shareholders in listed firms. Some evidence shows that share pledging could be used as an alternative funding source to mitigate the firm's financial constraints (Cheng et al., 2021). Other studies suggest that share pledging could have an adverse impact on a firm's long-term performance (Chauhan et al., 2021) such as difficulties in obtaining trade credits (Jiang et al., 2021), inducing higher business risks (Anderson and Puleo, 2020), having a higher cost of debt (Puleo et al., 2021), making risky investments (Tang et al., 2023), and lowering dividend pay-outs (Xu and Huang, 2021). In particular, consistent evidence has been documented on the negative association between share pledging activities and financial reporting quality, including lower accounting conservatism (Xu, 2021) and more optimistic information disclosure (Zhao et al., 2019). As a result, share pledging has been found to have negative capital market consequences such as a higher risk of that the stock price will crash (Zhou et al., 2021), less accurate analyst forecasts (Hu et al., 2021), and an impaired information environment (Xu and Huang, 2021). However, there is scant literature on the audit related consequence of share pledging by controlling shareholders. In this study, we attempt to examine the implication of share pledging from the perspective of auditors and to find out whether auditors consider this an additional business risk and thus increase audit fees to compensate for bearing a higher level of engagement risk.

Share pledging has been increasingly criticized by the public and regulators in China after a number of scandals related to share pledging were revealed.[1] The most recent and well-known scandal is Kangde Xin, a Chinese composite material manufacturer, which was found to have inflated its profits by RMB 11.5 billion (around USD1.8 billion) during the period 2015-2018 (Wang and Guo, 2020). The controlling shareholder was found to have pledged 93% of its shares for debt financing (FitchRatings, 2018). Therefore, our research is strongly

[1] Examples of the scandals include: Zhangzidao Fishery, which was found to inflate its 2016 financial year's profit by RMB 60 million (Zhang, 2020); and Kangmei Pharmaceutical, which was found to inflate its 2017 financial year's revenue by RMB 9 billion (Yu, 2019).

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motivated by the increasing public scrutiny on share pledging behaviours in China. China is also considered to be a unique research setting for this empirical question for two reasons. The first is a regulation on the standardization of share pledge repurchase transactions, launched in 2013 (Xiao et al., 2021), which further incentivises controlling shareholders to use share pledging as a primary source of financing. The second is the share pledging disclosure requirements introduced in May 2017 by the China Securities Regulatory Commission (CSRC). It is an intriguing question as to whether share pledging in the Chinese capital market is perceived by external auditors as a risk factor which leads to additional audit fees being charged to the client firm.

Using a sample of Chinese listed companies during the period 2004 to 2019, we examine whether the share pledging of controlling shareholders is associated with higher audit fees. Arguments are drawn from audit pricing theory (Simunic, 1980) and considering demand and supply perspectives of audit fees (Ittonen, Miettinen and Vahamaa, 2010). From the demand perspective, we anticipate that pledged firms, in order to maintain their share price, may be incentivised to engage with high quality auditors so as to send a positive signal to the market. High quality auditors are often highly priced thus audit fees would be higher for pledged firms than their non-pledged counterparts. Further, share pledging activities could induce higher business risk, which may cause a greater level of audit engagement risk and/or trigger extra audit effort. As a result, auditors may charge additional audit fees to pledged firms.

Our empirical results suggest that audit fees are positively associated with the proportion of shares pledged by controlling shareholders. We also test the moderating effect of a number of risk related factors including Main Board listing status, state ownership, and abnormal audit report lag (ARL). Our results establish that the positive association between audit fees and share pledging of controlling shareholders could be mitigated if the firm is listed on the Main Board and if the firm is a State-owned Enterprise (SOE). Moreover, abnormal ARL has been found to enhance the positive association between audit fees and firm share pledging activities. Our results remain robust after conducting a number of endogeneity tests including 2SLS instrumental variable analysis, entropy balancing analysis, difference-in-difference analysis, and alternative measures of share pledging.

Our research makes several contributions. First, our study provides new evidence on audit related consequences of share pledging in a significant capital market. Our research suggests that Chinese auditors respond to share pledging practice by applying extra audit effort

and charging a premium in audit pricing. Although literature suggests share pledging could benefit firms in various ways, our study takes the auditor's perspective and reinforces that the "dark side" of share pledging cannot be treated lightly. Second, findings of this study enrich the existing audit literature by introducing the share pledging activities of controlling shareholders into the audit pricing decision making model. At last, our study offers new insights by reporting robust empirical evidence on three moderating factors that could either mitigate (exacerbate) a firm's business risks, which leads to lower (higher) audit fees for pledged firms in China.

The paper proceeds as follows. Section 2 defines share pledging, summarises key literature, and provides an overview of the institutional background of share pledging in China. Section 3 reviews prior literature on audit pricing, audit engagement risks and share pledging, and develops the hypotheses. Section 4 describes our data and research methodology. Section 5 reports and discusses the results of the empirical analysis. Section 6 offers concluding remarks.

2. Share pledging in China

2.1 Define share pledging

Share pledging is defined as a financing activity where shareholders (i.e., the pledgor) use their equity shares as collateral for personal loans from a bank or other financial institution (i.e., the pledgee). The pledgors and pledgees negotiate a loan-to-value ratio (typically 50-80% of market price) based on the riskiness of the shares. The dollar value of loan proceeds is therefore determined by the loan-to-value ratio, the number of shares to be pledged, and the market price. Contract terms may vary, but the pledgor retains the title, voting rights and capital gain or losses from pledged shares, and they can use the proceeds of the personal loan for consumption or investment. Typically, the loans are non-recourse, but the pledgor must maintain the loan-to-value ratio. If the share price decreases too much, the pledgor may receive a margin call from the pledgee. If the pledgor fails to satisfy a margin requirement (either by providing additional shares as collateral or repaying the loan), the pledgee has the legal right to liquidate the pledged shares at market prices. Share pledging has its advantages over traditional loans. To the pledgee, the liquidity of pledged shares is higher, and the market value can be observed. To the pledgor, it is efficient, low cost and easy to obtain. More importantly, this approach allows the pledgor to raise funds but still retain their corresponding voting rights from the pledged shares.

Share pledging potentially elevates the risk for the controlling shareholder through margin calls and being forced to sell after a drop in share price, which in turn increases the risk of losing personal wealth and the control rights in the listed firm (Liu and Tian, 2021). Share pledging, therefore, has been documented as creating incentives for controlling shareholders to influence the stock price of the firm through actions such as reducing the firm's risk exposure, initiating mergers and acquisitions, and even manipulating accounting information (Bhatia et al., 2019; Shen et al., 2021; Tang et al., 2023; Zhou et al., 2021). Therefore, share pledging of controlling shareholders could induce risks to the firm (Anderson and Puleo, 2020).

2.2 Institutional background of share pledging in China

The share pledging market experienced fast growth following a regulation on the approval of share pledge repurchase transactions which was issued on 24th May 2013 by Shanghai Stock Exchange, Shenzhen Stock Exchange and China Securities Depository and Clearing Corporation (Xiao et al., 2021). The standardization of share pledge repurchase transactions simplifies the process of share pledge and lowers the financing costs, and therefore motivates shareholders to use share pledge as one of their major financing channels. Since then, the share pledging market has developed rapidly and the market value of pledged shares has increased from RMB 580 billion in 2013 to RMB 4,320 billion in 2020 (Eastmoney.com, 2010). China now requires details on share pledging disclosures.[2] For shares being pledged by shareholders who possess over 5% of shareholdings, the China Securities Regulatory Commission (CSRC) requires firms to make announcements within 2 to 5 working days, including information in the announcement about pledgees, pledgors, pledged firms, pledged shares, pledge start and end dates, and other information. However, there are currently no mandatory requirements to disclose the detailed purpose and use of the loan proceeds by the pledgors.

The rapid growth of the share pledge market was forced to slow down when regulators introduced regulations to restrict share pledging practice in 2018.[3] By then, however, the average share pledge ratio of Chinese listed firms had already reached a considerable level. Compared with the scale of share pledging in other capital markets, share pledging transactions

[2] For example, China Securities Regulatory Commission released several provisions on the reduction of shares held in a Listed Company by the shareholders, directors, supervisors, and senior executives of the listed companies on 26 May 2017, which took effect on the same day (China Securities Regulatory Commission, 2017). Shanghai Stock Exchange released "Notice of the Shanghai Stock Exchange on Issuing the Detailed Implementing Rules of the Shanghai Stock Exchange for Shareholding Reduction by Shareholders, Directors, Supervisors and Senior Executives of Listed Companies" on 27 May 2017 (Shanghai Stock Exchange, 2017).

[3] Securities Association of China released "Notice of the Securities Association of China on Issuing the Guidelines for the Risk Management of Securities Companies' Participation in Stock-Pledged Repo Transactions" on 15 January 2018, which reinforced the regulation on share pledging (Securities Association of China, 2018).

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in China are more prevalent and relatively large in scale. High-stake share pledging activities could induce serious social and economic consequences. First, it could lead to an increased risk of stock price crash and a significant plunge in market value in a short period of time. Empirical studies attribute the 36% crash in the Shenzhen Stock Exchange Component Index to excessive share pledging activities (Moon and Zhang, 2018). Second, several high-profile scandals in the Chinese security market were attributable to excessive share pledging. For example, Kangde Xin Composite Material Group overstated profits for the four years since 2015 by a total of RMB 11.9 billion. The controlling shareholder confessed that they had to manipulate earnings to support the stock price because they pledged over 93% of their shares.

3. Literature review and hypotheses development

3.1 Share pledging and business risks

Prior studies on share pledging has examined both determinants and consequences of share pledging activities. From the perspective of determinants, Cheng, et al. (2021) and Shen et al. (2021) find that share pledging is associated with the risk exposure of shareholders who undertake share pledging, the quality of the firm's corporate governance and its financial constraints. From the perspective of consequences, both the benefits and adverse effects of share pledging have been documented. One stream of literature claims controlling shareholders benefit from share pledging in that they recover the investment and relieve financial constraint or distress (Deren and Ke, 2018).

More recent literature focuses on the negative consequence of share pledging by controlling shareholders on the long-term performance of firms (Chauhan et al., 2021). For instance, Jiang et al. (2021) find it is harder for firms whose shares are pledged to obtain trade credit from suppliers. Puleo et al. (2021) provide evidence that pledged firms have a greater cost of debt. Tang et al. (2023) also find share pledging impacts on corporate behaviour, such as making risky investments, whereas Xu and Huang (2021) find pledged firms have usually reduced their dividend pay-out.

It is generally agreed that share pledging could induce an increased level of **business risks** to the pledged firms, namely financial reporting risk and information opacity (Huang and Xue, 2016; Li et al., 2019; Hu et al., 2021; Zhou et al., 2021). Prior studies document consistent evidence on the financial reporting risk introduced by share pledging of controlling shareholders (Singh, 2018; Zhao et al., 2019; Xu, 2021). The goal of controlling shareholders is to maximize personal wealth while retaining control rights over the firm. Since the shares

are taken as collateral, the pledgors' wealth and control rights are closely connected to the firm's stock performance. If the stock price decreases significantly, the margin calls are triggered and pledgors would have to repay a certain amount of loans or add additional shares as collateral to meet the loan-to-value ratio. If pledgors fail to meet the margin calls, the pledgees can sell the pledged shares, resulting in significant losses for the pledgors in both personal wealth and control rights. Therefore, the pledgors are strongly incentivised to manage the earnings of pledged firms to stabilize or boost the stock price (Huang and Xue, 2016; Deren and Ke, 2018; Xu, 2021). DeJong et al. (2020) study a sample of Chinese listed companies from 2003 to 2018 and find that pledged firms are more likely to manipulate earnings to avoid margin calls. Xu (2021) examines a large sample of listed firms in China during the period 2007-2013 and finds that controlling shareholders' share pledging has a negative influence on the accounting conservatism of the pledged firms.

Previous studies have also suggested that pledged firms can manipulate information disclosure to stabilize or boost the firm's stock price. Zhao et al. (2019) find a relationship between top management's positive tone and share pledging. Similarly, Wang et al. (2020) observe that the management earnings forecasts of the pledged firms are more optimistic than for non-pledged firms. Hu et al. (2021) document that the pledged firms could even collude with financial analysts to manipulate the market as analysts intentionally produce optimistic forecasts for pledged firms. Prior literature also suggests controlling shareholder share pledging is associated with negative capital market consequences such as an increase in stock price crash risk (for example, Hutton et al., 2009; Li et al., 2019; Xu et al., 2019; Zhou, et al., 2021); extremely negative stock returns (Palmrose et al., 2004); and increased stock volatility and lower firm value (Chauhan et al., 2021).

To summarise, existing literature confirms that the share pledging activities of controlling shareholders could bring both costs and benefits to a listed firm and their investors. Although share pledging could be an alternative funding source to mitigate the firm's financial constraints (Cheng et al., 2021), it could also lead to significant business risks such as higher financial reporting risks and a higher level of information opacity to investors. As there is little research evidence on how auditors perceive their client firm's share pledging activities from a business risk perspective, our study investigates this research question to fill in a gap in the literature.

3.2 Hypotheses development

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The audit pricing theory suggests that the audit fee compensates auditors for their efforts applied in gathering evidence and producing an audit opinion (Simunic, 1980; Kim et al., 2012). Simunic's (1980) audit pricing model defines audit fees as a function of the actual cost of audit effort (i.e., *the resource cost component*, such as audit hours) and the expected cost of audit risk (i.e., *the expected future loss component*) (Simon and Francis, 1988; Hay et al., 2006; De George et al., 2012). The *resource cost component* generally reflects the effort of the auditor, whereas the *expected future loss component* is mainly caused by the auditor's engagement risk (Simunic, 1980). When faced with increased engagement risk, auditors tend to conduct more thorough review procedures, to allocate high-ranked labour, and to invest more effort in that audit engagement, so as to acquire a more in-depth and comprehensive understanding of the client's industry, strategy, business models, and processes (Bell et al., 2008). As previously mentioned, although pledged firms could benefit from an alternative funding source to mitigate the firm's financial constraints (Cheng et al., 2021), share pledging can introduce significant business risks to the pledged firms (Huang and Xue, 2016; Li et al., 2019; Hu et al., 2021; Zhou et al., 2021). Auditors, in general, respond to high business risks and litigation risks by charging higher audit fees to client firms. For instance, Charles et al. (2010) provide evidence that auditors charge high audit fees to client firms when they perceive the business risk to be high and hence put extra effort in when conducting audit procedures. Using the textual disclosure of the litigious tone in the US market, Malik, Shan and Tong (2022) find litigation risk is associated with higher audit fees. The modern 'risk-oriented' audit model was established in China with the release of a series of new Audit Standards on 15 February 2006 (Gao et al., 2015). Under these standards, auditors in China are required to identify possible areas of high business risk, assess the risk of material misstatement, and continuously improve audit procedures to address these risks.

Prior audit literature in China suggests that audit market competition and the client's bargaining power could also affect audit fees. The audit market in China is characterized by small-sized audit firms and a low concentrated market (Huang et al., 2015; Wang, 2020), therefore auditors very often have to match their competitors' price to retain competitiveness in the market. Therefore, in China auditors may not be able to charge additional audit fees to firms whose shares are pledged by controlling shareholders.

Having said that, Ittonen et al. (2010) find that audit fees are affected by the demand and supply of audit services provided by the auditor. They argue that these two perspectives are not mutually exclusive, as they both affect the audit fees. The demand side perspective

suggests that the demand for audit quality is a function of client-driven incentives and competency. In order to maintain share price, pledge firms are incentivised to send a positive signal to the market by hiring high quality auditors who charge higher audit fees. However, the supply-side perspective suggests that the supply for audit quality is a function of the incentives and competency of the auditor (Simunic, 1980; Copley, Gaver and Gaver, 1995; DeFond and Zhang, 2014). Thus, an assessment of audit engagement risk on pledged firms may trigger auditors to revise their planning assumptions and maintain a high level of professional scepticism in gathering and evaluating audit evidence (Cho et al., 2015). Further, they may assign more experienced staff members or those with specialized skills, provide more supervision, and incorporate additional elements of unpredictability in the selection of further audit procedures (Fukukawa et al., 2011). The additional audit procedures and the expanded scope of the audit work will generally be reflected in an increase in audit fees.

Therefore, we anticipate that pledged firms may engage with high quality auditors in order to send a positive signal to the market to maintain their share price; at the same time, a high level of business risks associated with share pledging activities could also lead to greater audit engagement risk and/or trigger auditors' additional audit effort, which leads to higher audit fees. Based on the above argument, we developed the main hypothesis as below:

H1: There is a positive association between the share pledging of controlling shareholders and audit fees in China.

In addition, prior literature documents that Chinese companies listed on the Main Board have less margin call pressure, less financial constraint, better financial disclosure quality, better internal control and lower market risk (Lin, 2018; Zhao et al., 2019). [4,5] As a result, when these listed firms pledged their shares, they are less likely to be considered as high-risk clients by auditors, thus they are less likely to incur higher audit fees than their counterparts listed in

[4] In the Chinese stock market, firms could apply to be listed on the Main Board, the Small and Medium Enterprise (SME) Board, or the Growth Enterprise Market (GEM) Board. Larger and more mature companies could be listed on the Main Board (Carpenter and Whitelaw, 2017). To be listed on the Main Board, the company should meet one of the following criteria: (1) the net profit has been positive for the past 3 years, and the cumulative net profit for the past 3 years is not less than RMB 150 million. The net profit for the past year is not less than RMB 60 million. The cumulative net cash flow generated from operating activities in the past 3 years is not less than RMB 100 million or the cumulative operating income is not less than RMB 1 billion; (2) the expected market value is not less than RMB 5 billion, and the net profit for the past year is positive. The operating income for the past year is not less than RMB 600 million. The cumulative net cash flow generated from operating activities in the past 3 years is not less than RMB 150 million; or (3) the expected market value is not less than RMB 8 billion, and the net profit for the past year is positive. The operating income for the past year is not less than RMB 800 million (Shanghai Stock Exchange, 2023; Shenzhen Stock Exchange, 2023).

[5] Zhao et al., (2019) suggest that companies listed on the Main Board have a higher loan-to-value (LVO) ratio than those listed on SME and GEM.

Boards other than the Main Board. Therefore, we anticipate that pledged firms listed on the Main Board could enjoy relatively lower audit fees than those pledged firms that are not listed on the Main Board in China. Hence, it is proposed that listing on the Main Board will moderate the positive relationship between share pledging and audit fees:

H1a: Main Board listing status weakens the positive association between share pledging and audit fees in China.

Ownership structure could also influence auditors' risk assessment and the audit fees they charge to client firms (Leuz and Oberholzer-Gee, 2006). Liu and Subramaniam (2013) find that Chinese SOEs pay significantly lower audit fees than non-SOEs. Nearly half of the Chinese listed firms are state owned, and auditors consider the political connection of SOEs to be a mitigating factor in their assessment of engagement risk. There is no prior research on the mitigating effect on SOEs of share pledging and audit related consequences. Xie and Liao (2018) study Chinese listed companies during the period 2003-2016 and find that share pledging is associated with earnings management, but the positive association is much less pronounced in SOEs. Liu and Tian (2021) study the impacts of share pledging on the cost of equity capital, which is highly related to business risk. They document a mitigating effect on SOEs of the positive association between share pledging and equity capital cost. Based on prior literature, state ownership could alleviate the negative impact of share pledging on financial reporting quality and the cost of equity. Therefore, pledged firms with state ownership are considered more trustworthy, and auditors' assessment of engagement risk will be lower, which results in lower audit fees. Based on the above argument, we propose a moderating effect of state ownership on the positive relationship between share pledging and audit fees:

H1b: State ownership mitigates the positive association between share pledging and audit fees in China.

As mentioned earlier, the *resource cost component* of audit pricing theory generally reflects the effort of the auditor. Audit report lag (ARL) has historically been considered one of the very few audit output indicators that can be observed externally. Therefore ARL has often been used as a proxy for audit effort and efficiency in audit literature (Bamber et al., 1993). ARL has signalling potential, as prior literature suggests, to reduce earnings informativeness, cause delay in earnings announcements, and lead to lower market responses to earnings (Whittred and Zimmer, 1980). As a result, a shorter ARL is favoured by investors. Having said that, more recent research finds that a longer ARL could imply greater audit efforts

and thus a higher audit quality (Blankley et al., 2014; Knechel et al., 2009; Tanyi et al., 2010). Bryant-Kutcher et al. (2013) claim that only abnormally long ARL may signal a problem in the firm's financial reporting quality. Furthermore, abnormal ARL has also been found to increase the risk of stock price crash in China and such adverse capital market consequence is more severe for listed firms with internal control weakness (Habib and Huang, 2019). Therefore, we argue that auditors may exert additional audit effort on pledged firms in China due to the higher level of business risk associated with share pledging activities, which will lead to higher audit fees.

H1c: Abnormal audit report lag (ARL) makes the positive association between share pledging and audit fees more pronounced in China.

4. Methodology

4.1 The baseline model

Our hypothesis is tested by the model below, which is modified based on Kim et al., (2014) and Bills et al. (2017).

$$LnFee_{i,t} = \alpha_0 + \beta_1 PLEDGE_{i,t} + \beta_2 LnTA_{i,t} + \beta_3 MERGER_{i,t} + \beta_4 INV_{i,t} + \beta_5 REC_{i,t} + \beta_6 ROA_{i,t} + \beta_7 MtB_{i,t} + \beta_8 LEV_{i,t} + \beta_9 INTAN_{i,t} + \beta_{10} AGE_{i,t} + \beta_{11} BOARD_{i,t} + \beta_{12} DUAL_{i,t} + \beta_{13} SOE_{i,t} + \beta_{14} MainBoard_i + \beta_{15} BIG4_{i,t} + \beta_{16} AUDCHG_{i,t} + \beta_{19} LnDELAY_{i,t} + \beta_{20} Cross_{i,t} + \beta_{21} GC_{i,t} + Year + Industry + \varepsilon \quad (1)$$

where $LnFee_{i,t}$ is the dependent variable, which is measured as the natural logarithm of the audit fees paid by firm i in year t. $PLEDGE_{i,t}$ is the variable of interest, which is the proportion of shares that was pledged by the controlling shareholder of firm i in year t. $PLEDGE_{i,t}$ is therefore calculated as the number of shares pledged by the controlling shareholders divided by the number of shares held by the controlling shareholders.

4.2 Moderating analysis models

The following models are developed to examine the moderating effect of Main Board listing status, state ownership, and abnormal ARL on the positive association between audit fees and share pledging activities as proposed in H1a, H1b, and H1c, respectively.

$$LnFee_{i,t} = \alpha_0 + \beta_1 Pledge_{i,t} + \beta_2 MainBoard_{i,t} + \beta_3 Pledge_{i,t} * MainBoard_{i,t} + \beta_4 SOE_{i,t} + Control\ Variables + Year + Industry + \varepsilon \quad (2)$$

$$LnFee_{i,t} = \alpha_0 + \beta_1 Pledge_{i,t} + \beta_2 MainBoard_{i,t} + \beta_3 SOE_{i,t} + \beta_4 Pledge_{i,t} * SOE_{i,t} + Control\ Variables + Year + Industry + \varepsilon \quad (3)$$

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$$LnFee_{i,t} = \alpha_0 + \beta_1 Pledge_{i,t} + \beta_2 MainBoard_{i,t} + \beta_3 SOE_{i,t} + \beta_4 ABN\_ARL_{i,t} + \beta_5 Pledge_{i,t} * ABN\_ARL_{i,t} + Control\ Variables + Year + Industry + \varepsilon \quad (4)$$

$$LnFee_{i,t} = \alpha_0 + \beta_1 Pledge_{i,t} + \beta_2 MainBoard_{i,t} + \beta_3 SOE_{i,t} + \beta_4 ABN\_ARL_{i,t} + \beta_5 Pledge_{i,t} * MainBoard_{i,t} + \beta_6 Pledge_{i,t} * SOE_{i,t} + \beta_7 Pledge_{i,t} * ABN\_ARL_{i,t} + Control\ Variables + Year + Industry + \varepsilon \quad (5)$$

Model (2) includes an interaction term $Pledge_{i,t} * MainBoard_{i,t}$ to study the moderating effect of Main Board listing status. $MainBoard_i$ is a dummy variable, which is set to 1 if firm i is listed on the Main Board, and 0 otherwise.[6] Model (3) includes an interaction term $Pledge_{i,t} * SOE_{i,t}$ to study the moderating effect of state ownership. $SOE_{i,t}$ is set to 1 if firm i is ultimately controlled by the state, and 0 otherwise (Wang et al., 2008; Liu and Subramaniam, 2013). Model (4) includes an interaction $Pledge_{i,t} * ABN\_ARL_{i,t}$ to examine the moderating effect of abnormal audit effort. Abnormal audit report lag (ARL) ($ABN\_ARL_{i,t}$) captures the top 10% of the ARL, which often signals problems in financial reporting quality and audit negotiation (Chan et al., 2016). Model (5) includes the three interaction terms at the same time.

In the above models (1)-(5), we include four groups of control variables including (1) firm-specific characteristics, (2) corporate governance related, (3) capital market related, and (4) auditor's characteristics variables. Firm-specific control variables include firm size ($SIZE_{i,t}$), engaged in a merger or acquisition ($MERGER_{i,t}$), amount of inventory ($INV_{i,t}$), amount of accounts receivable ($REC_{i,t}$), return-in-asset ratio ($ROA_{i,t}$), long-term debt ratio ($LEV_{i,t}$), intangible assets ($INTAN_{i,t}$), market-to-book ratio ($MtB_{i,t}$), and firm age ($AGE_{i,t}$). Among them, firm size and complexity of the business (proxied by $MERGER_{i,t}$, $INV_{i,t}$ and $REC_{i,t}$) are key factors that are expected to be positively associated with audit fees (Blankley et al., 2012; Eshleman and Guo, 2014; Hoitash et al., 2007; Hoitash et al., 2008). Prior literature argues that the auditors of highly profitable firms would spend more time testing validity for the recognition of revenue and expenses (Simunic, 1980; Wallace, 1984; Joshi and

[6] There are three types of listing markets in the Stock Exchanges in China: Main Board, Small and Medium-Sized Enterprises Board (SME) and Growth Enterprise Market (GEM). The Main Board is set up in both Shanghai Stock Exchange and Shenzhen Stock Exchange for large companies; SME is a stock market set up in Shenzhen Stock Exchange in 2004 for small and medium companies. It was merged into the Main Board of SZSE in 2021; and GEM is a stock market set up in Shenzhen Stock Exchange in 2009 for smaller, faster-growing, and more "entrepreneurial" companies that do not fulfil the listing requirements of profitability or track record of the Main Board.

AL-Bastaki, 2000; Hoitash et al., 2007). Therefore, $ROA_{i,t}$ is expected to be positively associated with audit fees.

$MtB_{i,t}$, $LEV_{i,t}$, and $INTAN_{i,t}$ are used to control the effects of firm risk on audit fees (Blankley et al., 2012; Eshleman and Guo, 2014). As we expect business risk is positively associated with audit fees, higher *MtB* is expected to lead to higher audit fees. Empirically, the relationship between $LEV_{i,t}$ and audit fees is not conclusive. As an indicator of firm risk, $LEV_{i,t}$ is expected to positively associate with audit fees (Taylor and Simon, 1999; Nikkinen and Sahlström, 2005). However, a higher leverage would lead to greater monitoring from the lender, resulting in a lower audit risk and audit fees (Chaney et al., 2004; Barua et al., 2019). $INTAN_{i,t}$ has been found to be positively associated with audit fees (Visvanathan, 2017; Datta et al., 2020). Firms with longer history ($AGE_{i,t}$) are believed to have more trust-worth and therefore lead to lower audit fees.

We incorporate three governance related variables in our empirical testing, including CEO duality ($DUAL_{i,t}$), board size ($BOARD_{i,t}$), and state ownership ($SOE_{i,t}$). A higher level of internal monitoring ($BOARD_{i,t}$) is expected to reduce the audit engagement risk and then reduce audit fees (Pathan, 2009; Chen et al., 2014). Two capital market related control variables are employed: firms listed on the Main Board ($MainBoard_i$), and firms that are listed on A-share and also listed on either B-share or H-share markets ($Cross_{i,t}$). Firms listed on B-share or H-share markets are required to prepare audited financial statements for foreign investors (Ke et al., 2015).

At last, we incorporate a set of variables to control auditor characteristics. Extensive literature has documented a positive association between a firm's characteristics (e.g., size, complexity, profitability) and audit fees (Francis and Simon, 1987; Simon and Francis, 1988; Menon and Williams, 2001; Carson et al., 2004; Hay et al., 2006). In terms of the auditor's characteristics, it is found that the reputation of the auditor, auditor experience, and the audit market concentration has a positive relationship with audit fees (Ferguson et al., 2003; Choi et al., 2010; Hentati and Jilani, 2013; Eshleman and Lawson, 2017). Therefore, we include Big 4 auditors ($BIG4_{i,t}$) to control audit quality and auditor reputation.[7] Prior research provides evidence that large auditors charge a premium, so $BIG4_{i,t}$ is expected to have a positive relationship with audit fees (Peel and Roberts, 2003; Choi et al., 2010). $AUDCHG_{i,t}$ captures

[7] Prior research also finds that the Big Four auditors charge a price premium (Campa, 2013).

fee negotiation at the initial audit engagement (Simon and Francis, 1988). It is expected $AUDCHG_{i,t}$ will be positively associated with audit fees (Huang et al., 2014). $LnDELAY_{i,t}$ measures the number of days between fiscal year-end and the signature date of the audit opinion, which reflects the efforts that auditors have put into this service. Therefore, larger $LnDELAY_{i,t}$ is associated with higher audit fees (Lobo and Zhao, 2013). Modified audit opinion ($GC_{i,t}$) measures the audit risk (Ettredge et al., 2014). Finally, year and industry dummy variables are employed to control for year and industry fixed effects. All variables are defined in Appendix A.

4.2 Data Sample

Our analyses use data from companies listed on Chinese stock markets between 2004 and 2019. All data is retrieved from the CSMAR (China Stock Market and Accounting Research) database and the continuous variables are winsorized at 1%.[8]

To be included in our sample, firms must have financial information available in the CSMAR database. In accordance with other empirical research in this area, we exclude financial firms and those receiving special treatment (ST) from our sample. After screening, our sample contains 30,950 company-year observations and is comprised of 3,526 stocks, of which 2,071 are listed on the Shanghai Stock Exchange (SSE) and 1,454 are listed on the Shenzhen Stock Exchange (SZSE). Table 1 below displays the number of samples in each year across industries according to the industry classification of the China Securities Regulatory Commission (CSRC). Most of our sample companies fall into the manufacturing and information industries. Table 2 Panel A shows the number of samples by stock markets. There are 19,198 firm-year samples from companies listed on the Main Board, 7,346 firm-year samples from companies listed on the Small and Medium-Sized Enterprises Board (SME), and 4,406 firm-year samples from companies listed on the Growth Enterprise Market (GEM). Table 2 Panel B reports the samples by different types of shares. 28,917 firm-year samples are from A-share only companies, 1,080 firm-year samples are from AB-share companies, 942 firm-year samples are from AH-share companies, and 12 firm-year samples are from ABH-share companies.

[INSERT TABLES 1 and 2]

[8] We also winsorize the continuous variable at 2.5% and 5.0% to exclude the possibilities that the significant results are caused by outliers.

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4.3 Descriptive Statistics

Table 3 reports descriptive statistics for all variables employed in this research. It can be observed that the mean (median) values of the natural logarithm of audit fees (*LnFee*) is 13.63 (13.53), which suggests that the audit fees paid by a firm are RMB 830,680.10 on average and RMB 751,630.40 in median. The mean (median) value of the proportion of shares pledged by the controlling shareholder (*PLEDGE*) is 0.15 (0.00), showing that on average controlling shareholders pledged 15% of the shares they owned, but over 50% of controlling shareholders did not pledge their shares (median is 0). The mean (median) value of the natural logarithm of market value (*SIZE*) is 22.73 (22.59), which suggests that the market value of a firm in the sample is RMB 3,342.55 million on average and RMB 2,876.96 million in median.

Table 3 also shows that in this sample, the average market-to-book ratio (*MtB*) is 1.9:1, the age of firms (*AGE*) is 15.62 years, the size of the board (*BOARD*) is 8.6, 34% of the companies are State-Owned-Enterprises (*SOE*), 61% of the companies are listed on the Main Board (*MainBoard*), 6% of the companies were audited by the "Big 4" audit firms, and it took 90.9 days for the auditors to complete auditing.

The statistics for these variables show that the mean values are greater than the median values, indicating that these variables are positively skewed. For other variables, Table 4 also shows the same trend that the mean values are greater than the median values and, therefore, are positively skewed.

[INSERT TABLE 3]

5. Results discussion

5.1 Correlation statistics

Table 4 reports Pearson correlation coefficients for all variables included in the model. For audit fees, Table 4 shows that the natural logarithm of audit fees (*LnFee*) has a significant correlation with share pledging ratio (*PLEDGE*).

Most of the correlation relationships between *LnFe*e and the control variables are consistent with our expectations. It has a significantly positive relationship with the natural logarithm of the market value of the firm (*SIZE*), the size of inventory (*INV*), leverage ratio (*LEV*), the natural logarithm of intangible assets (*INTAN*), the natural logarithm of days delayed (*LnDelay*), and the "Big 4" auditors (*Big4*). The correlation between *LnFee* and the return on

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assets (*ROA*), the size of receivable (*REC*), the market-to-book ratio (*MtB*), the firm age (*AGE*), and the board size (*BOARD*) are contrary to our expectations. These relationships will be further investigated by employing Ordinary Least Squares (OLS) regression.

Among the independent variables, there is no strong multicollinearity detected as all coefficients are less than 0.6. In order to further access the presence of multicollinearity, the multicollinearity test is conducted by using the Generalized Variance Inflation Factor (GVIF). The test reveals absence of multicollinearity because $GVIF^{(\frac{1}{2*Df})}$ are consistently less than the rule of thumb value $\sqrt{5}$.

[INSERT TABLE 5]

5.2 The main results

5.2.1 Baseline regression analysis

Table 5 presents the results of examining the relationship between audit fees and share pledging ratio for controlling shareholders. Table 5 shows evidence that audit fees are positively related to the share pledging ratio.

Column (1) reports the regression results using the baseline model. After controlling for variables that could also explain audit fees, the coefficient of *PLEDGE* is positive and significant (coefficient = 0.074) at 1%, suggesting that the share pledging ratio of controlling shareholders has a significantly positive impact on audit fees. In terms of economic significance, it means that a 1% increase in share pledging ratio increases the audit fees by 7.4%, which corresponds to approximately 9.6% of the standard deviation of the audit fees in our pooled sample (i.e., RMB 79,832). That is to say, the share pledging ratio of controlling shareholders is an important factor in determining audit pricing in China. Audit fees increase with the share pledging ratio of controlling shareholders, ceteris paribus. This result supports our Hypothesis H1, that is, share pledging activities are positively associated with audit fees in China.

The coefficients of control variables are also as expected. *SIZE* has a significantly positive (coefficient is 0.397 at p<1%) relationship with audit fees, which is consistent with our expectations and prior literature (Chan et al., 1993; Goodwin-Stewart and Kent, 2006; Naser and Nuseibeh, 2007). The coefficients of proxies for business complexity, such as *MERGER* (coefficient is 0.072 at p<1%), *REC* (coefficient is 0.143 at p<1%) and *GC* (coefficient is 0.089 at p<1%), are all positive and significant, except that the coefficient of

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INV (coefficient is 0.001) is not significant at p<10%. This is consistent with the findings of Hoitash et al. (2007) and Visvanathan (2017). The coefficients of proxies for business risk, such as *LEV* (coefficient is 0.144 at p<1%), *INTAN* (coefficient is 0.320 at p<1%), *MtB* (coefficient is -0.089 at p<1%) and *AGE* (coefficient is -0.002 at p<1%), are consistent with our expectation, except for MtB (Chaney et al., 2004; Visvanathan, 2017; Barua et al., 2019; Datta et al., 2020). *LEV* and *INTAN* both have a positive association with audit fees at the significant level of 1%. *AGE* has a negative relationship with audit fees at a significant level of 1%. The coefficients for the proxies of auditor-related attributes, namely *BIG4* (0.597 at 1%), *AUDCHG* (-0.046 at 1%), *LnDelay* (0.114 at 1%) and *Cross* (0.504 at 1%), are all significant at the 1% level and the signs of coefficients are all as expected (Lobo and Zhao, 2013; Ettredge et al., 2014). The coefficient for *ROA* (-0.399 at 1%) is negative and significant at 1%, suggesting that the firm's probability is negatively associated with audit fees. This is contrary to the findings of Joshi and AL-Bastaki (2000) and Hoitash et al. (2007).

Importantly, the ownership structure (*SOE,* -0.058 at 1%) and the listing market (*MainBoard,* 0.144 at 1%) are both found to be able to explain the audit fees. As expected, SOEs pay lower audit fees and companies listed on the Main Board pay higher audit fees, ceteris paribus. The coefficients of *SOE* are significantly negative across all columns, suggesting that government ownership significantly affects the fees charged by auditors. Therefore, SOEs pay significantly lower audit fees than non-SOEs. This is consistent with the findings of a majority of prior literature, such as Wang et al., (2008), Liu and Subramaniam (2013) and Lin and Yen (2016). For example, Liu and Subramaniam (2013) study a sample of Chinese listed companies during the period 2001 to 2008 and find evidence that SOEs pay significantly lower audit fees than non-SOEs.

5.2.2 Moderating analysis

We further study the effect of three moderating factors on the positive association between audit fees and share pledging, namely, Main Board listing status, state ownership, and abnormal ARL.

Columns (2) to (5) of Table 5 present the results of cross-sectional regression analysis. Column (2) reports the result of the regression model (2). The coefficient for *PLEDGE*MainBoard* (coefficient is -0.155 at p<1%) is negative and significant at 1%, suggesting a significant mitigating effect of a Main Board listing on the positive relationship between audit fees and share pledging. In terms of economic significance, pledged firms listed

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on the Main Board are associated with reduced audit fees of around 15.5%, which corresponds to approximately 20.13% of the standard deviation of the audit fees in our pooled sample (i.e., RMB 167,216). Our results support H1a and confirm that pledged firms listing on the Main Board are charged relatively lower audit fees than the pledged firms that are not listed on the Main Board in China.

Column (3) of Table 5 reports the result of the regression model with the interaction term *PLEDGE*SOE*. The coefficient for *PLEDGE*SOE* is negative (coefficient is -0.213) and significant at 1%, suggesting a significant mitigating effect of state ownership on the positive association between audit fees and share pledging. With regard to economic significance, when pledged firms are state-owned, it is associated with approximately 21.3% decrease in audit fees, which corresponds to 27.66% of the standard deviation of the audit fees in our pooled sample (i.e. 229,766RMB). Therefore, our results support H1b and document that pledged firms with state ownership (i.e. SOEs) are charged relatively lower audit fees than those non-SOE pledged firms in China.

Column (4) of Table 5 reports the result of the regression model with interaction term *PLEDGE*ABN_ARL*. The coefficient for *PLEDGE*ABN_ARL* is positive (coefficient is 0.051) and significant at 1%, suggesting that abnormal audit report lag makes the positive association between audit fees and share pledging more pronounced. In terms of economic significance, for pledged firms with abnormal audit report lag (ARL), it is associated with an increase in the firm's audit fee by approximately 5.1%, which corresponds to 6.62% of the standard deviation of the audit fees in our pooled sample (i.e. 54,991RMB). In other words, pledged firms with abnormally longer report lag are perceived by auditors as riskier thus they are charged at higher audit fees than their pledged counterparts. Therefore our results support H1c.

Column (5) reports the results of the regression model with interaction terms *PLEDGE*MainBoard* (coefficient is -0.132 at p<1%), *PLEDGE*SOE* (coefficient is -0.149 at p<1%), and $Pledge_{i,t} * ABN\_ARL_{i,t}$ (coefficient is 0.039 at p<1%). The coefficients for the first two interaction terms are negative and significant at 1%, suggesting a significant mitigating effect of the two variables on the positive relationship between audit fees and share pledging; the coefficient for $Pledge_{i,t} * ABN\_ARL_{i,t}$ is positive and significant at 1%, providing strong evidence that abnormal ARL signals greater risks thus making the positive association between share pledging and audit fees more pronounced. Therefore, our results suggest that pledged SOEs listed on the Main Board would enjoy relatively lower audit fees

compared with their pledged counterparts (i.e. non-SOEs or firms listed on Boards other than the Main Board). At the same time, pledged firms with abnormal ARL tend to pay even higher audit fees.

Overall, we provide important new evidence that the share pledging ratio of controlling shareholders is positively associated with audit fees in China. In addition, the ownership structure (*SOE*) and the stock market (*MainBoard*) exert a significant mitigating effect on the positive association between audit fees and share pledging, whereas abnormal ARL ($ABN\_ARL_{i,t}$) makes the positive relationship between audit fees and share pledging more pronounced.

[INSERT TABLE 5]

5.3 Robustness tests

5.3.1 2SLS Instrumental variable analysis

To mitigate potential endogeneity issues, we conduct 2SLS Instrumental variable regressions. Two instrumental variables (IV) are used in this study include: (1) *M_PLEDGE* is the industry mean of the share pledging ratio excluding the focal firm (Ouyang, Xiong, and Fan, 2019); and (2) *P_PLEDGE* is the province mean of the pledging ratio excluding the focal firm (Li, Huang, Shi, and Yang, 2022). Firms in the same industry/province operate in a similar market, so the industry average pledge ratio is likely to affect the firm's pledge decision but could not affect the firm's audit fees due to different firm specific characteristics such as complexity and size. Therefore, we consider *M_PLEDGE* and *P_PLEDGE* would meet both the *relevance* and *exclusion* requirements of the instrumental variable.

Table 6 presents the results of 2SLS instrumental variable analysis for the use of two instrumental variables. When *M_PLEDGE* (the first IV) is used as the instrumental variable, the coefficient (0.859, p<0.01) for the first stage variable, *M_PLEDGE* is significant and positive, implying that the share pledging ratio is highly correlated across firms in the same industry. The coefficients on *PLEDGE* in the second stages are significant and positive (coefficient, 0.039, p<0.01). When *P_PLEDGE* (the second IV) is adopted as the instrumental variable, the coefficient (0.880, p<0.01) for the first stage variable, *P_PLEDGE* is significant and positive, suggesting that the share pledging ratio is highly correlated across firms in the same province. The coefficients on *PLEDGE* in the second stages are significant and positive (coefficient, 0.026, p<0.05).

The validity of the instrumental variables has been tested. The *K–Paap rk LM* statistic for the under-identification test is significant at the 1% level for both instrumental variables, (7,718.27 at p<0.001 for IV1 and 7,952.19 at p<0.001 for IV2), indicating that the chosen instruments meet the identification criteria. A weak instrumental variable test is also conducted. Both the *Cragg–Donald Wald F* statistic and the *K-Paap Wald F* statistic, as shown in Table 6, are much greater than the *Stock-Yogo* critical value at 10%. Therefore the instruments adopted in this study also satisfy the weak instrument test. The results of validity tests suggest that the 2SLS instrumental variable models are well specified and adequately defined (Wouterse, 2016). In conclusion, the results of the 2SLS instrumental variable regression are consistent with the baseline results and support our hypothesis that share pledging is positively associated with audit fees in Chinese listed firms.

[INSERT TABLE 6]

5.3.2 Entropy balancing analysis

Prior studies suggest that matching techniques could alleviate endogeneity issues (e.g., Armstrong, Jagolinzer, and Larcker, 2010; Rouen, 2020). More recent studies have adopted entropy balance matching rather than propensity score matching and confirmed the former technique is more effective because it avoids reduction in sample and minimizes reliance on less restrictive assumptions. More importantly, entropy balance matching reaches balance at multiple moments of the distribution of covariate (e.g., Hainmueller, 2012; Merkley, Michaely and Pacelli, 2020). To further mitigate the endogeneity concerns arising from variation in observable firm-specific characteristics, we re-run the baseline model using the entropy balanced sample. Regression results are reported in Table 7. This matching technique enables proper covariate balance between treated (pledged firms) and control (non-pledged firms) samples. By using the entropy balancing matching technique, observations in the control group are allocated a weight, so that the mean, variance, and skewness of the distribution for each matched variable is very similar to its counterparts in the treated group. By doing so, we are able to achieve a matched sample with no significant differences between the treated and control groups (Armstrong et al., 2010). The matching process is conducted based on 18 different covariates, and the differences in covariates as shown in Panel A of Table 7 suggests that proper entropy balancing has been reached.

We then conduct entropy-balanced regression, and the results are presented in Panel B of Table 7. The coefficients of *PLEDGE_Dummy* are significant and positive (coefficient is 0.031 at $p < 0.01$), consistent with the baseline regression results. To conclude, the results of entropy

balancing analysis supports our main hypothesis that there is a significant and positive association between pledged firms and audit fees.

[INSERT TABLE 7]

5.3.3 Difference-in-difference analysis

As explained earlier, the 2013 regulation on the approval of share pledge repurchase transactions simplified the process of share pledging and reduced financing costs (Xiao et al., 2021). The 2013 regulation provides shareholders with stronger incentives to use share pledge as one of their major financing channels. Therefore, we predict that firms with share pledging are associated with higher audit fees after the 2013 regulation. We construct the following equation to conduct difference-in-difference analysis, using the 2013 regulation as an exogenous shock.

$$LnFee_{i,t} = \alpha_0 + \beta_1 Pledge_{i,t} + \beta_2 Post + \beta_3 Pledge_{i,t} \times Post + Control\,Variables + Year + Industry + \varepsilon$$

In the above equation, i represents firm i, and t represents year t. The dependent variable $LnFee_{i,t}$ is the audit fees paid by firm i at year t. The independent variable $Pledge_{i,t}$ is a share pledging variable proxied by the share pledging ratio of firm i at year t. A binary variable $Post$ is constructed to interact with the *Pledge* variable. *Post* equals 1 for observations after 2013. Based on our prediction, the interaction term $Pledge_{i,t} \times Post$ is expected to be significant and positive.

Consistent with our expectations, the interaction term $Pledge_{i,t} \times Post$ is significantly positive in predicting the firm's audit fees (Coefficient=0.063, $p<0.01$), as shown in Table 8. This finding suggests that Chinese listed firms with a higher pledging ratio are charged higher audit fees following the launch of the 2013 share pledge repurchase transactions regulations. One possible explanation could be that as share pledging became a popular financing option for shareholders, auditors recognised the risks associated with such financing option and thus charged pledged firms a higher premium to compensate for the additional risks auditors needed to bear in the engagement. Another possible explanation could be that pledged firms are keen to pay extra audit fees to engage with higher quality auditors. This is to maintain the pledged firm's share price by providing assurance on the firm's financial reporting quality, which is consistent with our hypothesis.

[INSERT TABLE 8]

5.3.4 Alternative measurement

We also use an alternative definition of the dependent variable, *PLEDGE_Dummy*. We define *PLEDGE_Dummy* as a dummy variable equal to 1 at different thresholds of controlling shareholder share pledging proportion, i.e., >0%, 10%, 20%, 30%, and 50%. Table 9 Panel A shows the regression results. Columns (1) – (5) show the regression analysis results when the threshold is >0%, >10%, >20%, >30% and >50%, respectively. The coefficients for *PLEDGE* are all positive and significant at 5%, suggesting that it has a significantly positive impact on audit fees. Therefore the overall empirical testing results support our main hypothesis.

[INSERT TABLE 9]

6. Conclusion

Our study empirically examines whether the share pledging activities of controlling shareholders is associated with audit fees in China. Using a large sample of Chinese listed companies during the period of 2004-2019, we find evidence that the proportion of share pledging by controlling shareholders is significantly positively associated with audit fees paid by Chinese listed firms. This positive association is less pronounced when the firm is listed on the Main Board market and/or is a SOE. The positive relationship between audit fees and share pledging is more pronounced when the firm has abnormal audit report lag. Furthermore, our results suggest that pledged firms that are able to enjoy relatively lower audit fees have features including: listing on the Main Board, state ownership, and do not have abnormal audit report lag. The results are robust to a series of endogeneity tests including 2SLS instrumental variable analysis, entropy balancing analysis, difference-in-difference analysis, and alternative measures of share pledging.

Our study provides new evidence on audit related consequences of share pledging in an emerging capital market; our findings further enrich the existing audit literature by introducing share pledging into the audit pricing model. Such findings have important practical implications to those charged with governance, as a firm's board needs to comprehensively understand the adverse consequences of share pledging while pursuing it as the firm's major source of financing. Finally, our study also has policy implications to stock market regulators such as the Chinese Securities Regulatory Commission (CSRC) in China. Our study finds strong evidence that pledged firms listed on the Main Board and/or with state ownership are

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perceived by auditors as less risky, and so regulators could consider developing a threshold-based share pledging disclosure and pledge ratio requirements based on factors such as firms' listing status and ownership structure.

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Appendix A. Variable Definition

Variables	Definition
Dependent variable	

$LnFee_{i,t}$	The natural logarithm of the audit fees paid by firm i in year t.
Independent variable	
$PLEDGE_{i,t}$	The proportion of shares that was pledged by the controlling shareholder of firm i in year t (Cheng et al, 2021).
$M\_PLEDGE_{i,t}$	The industry mean of share pledging ratio excluding the focal firm (Ouyang, Xiong, and Fan, 2019).
$P\_PLEDGE_{i,t}$	The province mean of pledging ratio excluding the focal firm (Li, Huang, Shi, and Yang, 2022).
Firm-specific control variables	
$SIZE_{i,t}$	The natural logarithm of the market value of firm i at the end of year t (Bills, Cunningham, and Myers, 2016; Reichelt and Wang, 2010).
$MERGER_{i,t}$	a dummy variable, set to 1 if firm i is engaged in a merger or acquisition during year t, and 0 otherwise (Hoitash et al. 2007; Blankley et al., 2012).
$INV_{i,t}$	The amount of inventory of firm i in year t, scaled by total assets at the end of the same year (Hoitash et al. 2007; Blankley et al., 2012).
$REC_{i,t}$	The amount of accounts receivable of firm i in year t, scaled by total assets at the end of the same year (Hoitash et al. 2007; Blankley et al., 2012).
$ROA_{i,t}$	The return-in-assets ratio of firm i in year t (Simunic, 1980; Wallace, 1984; Joshi and AL-Bastaki, 2000; Hoitash et al., 2007).
$LEV_{i,t}$	The long-term debt ratio of firm i in year t, calculated as long-term debt divided by total assets (Barua et al., 2019; Chaney et al., 2004; Nikkinen and Sahlström, 2005;Taylor and Simon, 1999).
$INTAN_{i,t}$	The intangible assets of firm i in year t, scaled by total assets at the end of the same year (Datta et al., 2020; Visvanathan, 2017).
$MtB_{i,t}$	The market-to-book ratio, calculated as firm i's market value divided by book value at the end of year t.
$AGE_{i,t}$	The natural logarithm of years since the establishment of firm i.
Governance related control variables	
$DUAL_{i,t}$	A dummy variable representing CEO duality, equals 1 if CEO is also the Chair of the board, and 0 otherwise.
$BOARD_{i,t}$	A proxy for the level of internal monitoring, measured as the logarithm of board size (Chen et al., 2014; Michelon et al., 2015; Pathan, 2009).
$SOE_{i,t}$	A dummy variable, set to 1 if firm i is ultimately controlled by the state, and zero otherwise (Wang et al., 2008; Liu and Subramaniam, 2013).
Capital market related control variables	
$MainBoard_i$	A dummy variable, set to 1 if firm i is listed on the Main Board, and 0 otherwise (Jin et al., 2021).
$Cross_{i,t}$	A dummy variable, set to 1 if firm i is also listed on B-share or H-shares markets, and 0 otherwise (Ke et al., 2015).
Audit related control variables	
$BIG4_{i,t}$	A proxy for audit quality and auditor reputation, a dummy variable that sets to 1 if auditors are Big 4 audit firms, and zero otherwise (Peel and Roberts, 2003; Choi et al., 2010).
$AUDCHG_{i,t}$	A dummy variable that sets to 1 if it is the first year that the auditor provides auditing services to the firm, and zero otherwise.
$LnDELAY_{i,t}$	The natural logarithm of days between fiscal year-end and the signature date of the audit opinion (Lobo and Zhao, 2013).
$GC_{i,t}$	A dummy variable, equals to 1 if audit opinion was modified for going-concern, else 0 (Ettredge et al., 2014).
$ABN\_ARL_{i,t}$	A dummy variable coded 1 for firm-year observations in the top 10% of the audit report lag (the number of calendar days from fiscal year-end to the date of the auditor's report) distribution (Chan et al., 2016).

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Table 1 Panel A: Companies in the sample across industries and stock markets (2004-2012)

Industries	2004		2005		2006		2007		2008		2009		2010		2011		2012	
	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE
Agriculture, Forestry, Fishing & Hunting	13	6	11	6	9	8	12	7	14	9	14	10	16	11	19	11	17	13
Mining	13	4	11	4	13	4	14	6	20	8	23	8	29	10	31	12	37	15
Manufacturing	365	275	330	280	310	291	265	339	335	388	371	407	460	476	560	556	662	730
Utilities	30	18	28	16	30	17	23	18	24	20	35	20	41	20	41	22	48	29
Construction	17	7	15	5	9	11	9	12	17	13	21	17	20	16	22	17	33	24
Retailing & Wholesaling	46	25	44	25	41	25	38	26	40	28	46	30	48	40	55	45	77	56
Transportation & Warehousing	28	15	27	16	28	15	35	14	40	16	38	15	46	17	48	17	56	19
Accommodation & Food Services	2	3	2	3	2	2	3	4	3	4	3	4	2	4	3	3	2	7
Information	25	12	22	12	21	15	21	13	21	21	31	28	42	32	55	35	75	38
Real Estate	29	20	28	18	26	18	23	19	30	24	40	29	56	46	54	48	63	60
Rental & Leasing	3	6	4	6	4	7	4	9	4	10	5	10	7	10	7	10	9	9
Scientific & technical services								1		1	3	1	5	1	6	1	8	4
Water Conservancy, Environ. & Public Facilities	5	5	3	5	2	4	3	2	7	4	1	5	3	3	2	4	8	11
Personal services	3	1	2	2	3	1	3	2	3	3	3	3	3	2	6	3		
Education Services																	1	
Healthcare & social Assistance											2		1		2		3	
Arts, Entertainment & Recreation	2	2	2	2	2	2	3	2	3	2	5	2	8	2	12	4	17	5
Complex	27	22	27	23	22	25	22	21	26	18	26	22	27	13	28	15	14	6
Total	**608**	**421**	**556**	**423**	**522**	**445**	**478**	**495**	**587**	**569**	**667**	**611**	**814**	**703**	**951**	**803**	**1130**	**1026**

Note: SSE shows the number of companies listed on Shanghai Stock Exchange; SZSE shows the number of companies listed on Shenzhen Stock Exchange.

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Table 1 Panel B: Companies in the sample across industries and stock markets (2013-2019)

Industries	2013		2014		2015		2016		2017		2018		2019	
	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE	SZSE	SSE
Agriculture, Forestry, Fishing & Hunting	16	13	16	14	18	16	20	16	18	16	19	15	20	15
Mining	38	18	41	19	42	20	45	19	47	17	50	19	51	19
Manufacturing	656	730	712	726	809	738	915	779	1181	841	1261	879	1373	875
Utilities	48	29	51	27	50	30	57	33	61	36	65	38	67	38
Construction	34	25	33	27	36	32	47	34	52	38	52	38	50	38
Retailing & Wholesaling	79	56	77	53	79	52	85	53	92	54	94	55	96	56
Transportation & Warehousing	56	19	54	18	56	16	59	20	62	21	67	28	70	29
Accommodation & Food Services	2	6	1	6	3	4	3	5	3	5	3	5	3	5
Information	76	36	85	38	99	41	130	50	161	56	181	60	213	68
Real Estate	58	57	59	53	64	53	58	48	60	47	61	51	62	51
Rental & Leasing	9	9	9	11	11	10	15	15	17	18	18	22	22	23
Scientific & technical services	7	4	12	4	15	5	20	5	32	5	38	9	44	12
Water Conservancy, Environ. & Public Facilities	8	13	10	14	13	15	16	13	24	12	30	16	32	17
Personal services											1		1	
Education Services	1		1		1		2	1	2		2	1	4	4
Healthcare & social Assistance	3		3		4		4	2	5	3	5	4	6	5
Arts, Entertainment & Recreation	17	6	18	5	22	10	27	11	39	14	41	14	42	14
Complex	14	7	13	7	11	7	14	7	14	7	14	5	13	5
Total	**1122**	**1028**	**1195**	**1022**	**1333**	**1049**	**1517**	**1111**	**1870**	**1190**	**2002**	**1259**	**2169**	**1274**

Note: SSE shows the number of companies listed on Shanghai Stock Exchange; SZSE shows the number of companies listed on Shenzhen Stock Exchange.

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Table 2 Companies in the sample by listing boards and share types

	Panel A: by listing boards				Panel B: by share types				
	Main Board	SME	GEM	Total	A-share Only	AB-shares	AH-shares	ABH-Shares	Total
2004	995	34	0	1,029	927	69	33	0	1,029
2005	933	46	0	979	882	64	33	0	979
2006	888	79	0	967	868	64	35	0	967
2007	818	155	0	973	872	58	43	0	973
2008	939	217	0	1,156	1044	60	51	1	1,156
2009	1,003	247	28	1,278	1164	63	50	1	1,278
2010	1,064	343	110	1,517	1396	67	53	1	1,517
2011	1,108	446	200	1,754	1625	71	57	1	1,754
2012	1,201	631	324	2,156	2014	70	71	1	2,156
2013	1,216	619	315	2,150	2006	72	71	1	2,150
2014	1,227	631	359	2,217	2078	68	70	1	2,217
2015	1,288	661	433	2,382	2240	70	71	1	2,382
2016	1,393	721	514	2,628	2486	72	69	1	2,628
2017	1,601	804	655	3,060	2921	68	70	1	3,060
2018	1,706	847	708	3,261	3109	72	79	1	3,261
2019	1,818	865	760	3,443	3285	71	86	1	3,443
Total	**19,198**	**7,346**	**4,406**	**30,950**	**28,917**	**1,079**	**942**	**12**	**30,950**

Note for Panel A: SME refers to Small and Medium-sized Enterprise board of SZSE; GEM refers to Growth Enterprise Market of SZSE.

Table 3: Descriptive statistics for all variables

	Mean	Std. Dev.	Median	25 percentile	75 percentile	Min	Max
LnFee	13.63	0.77	13.53	13.12	14.00	10.31	19.40
PLEDGE	0.15	0.29	0.00	0.00	0.15	0.00	1.00
SIZE	22.73	1.11	22.59	21.96	23.35	20.55	26.14
MERGER	0.37	0.48	0.00	0.00	1.00	0.00	1.00
INV	0.14	0.12	0.12	0.06	0.19	0.00	0.46
REC	0.11	0.09	0.09	0.03	0.17	0.00	0.32
ROA	0.17	0.06	0.18	0.17	0.20	0.00	0.21
LEV	0.44	0.20	0.44	0.27	0.60	0.11	0.80
INTAN	0.04	0.04	0.03	0.01	0.06	0.00	0.14
MtB	1.90	0.95	1.56	1.21	2.25	0.99	4.49
AGE	15.62	5.94	15.00	11.00	20.00	1.00	61.00
DUAL	0.24	0.43	0.00	0.00	0.00	0.00	1.00
BOARD	2.15	0.21	2.20	2.08	2.20	0.00	2.89
SOE	0.34	0.47	0.00	0.00	1.00	0.00	1.00
MainBoard	0.61	0.49	1.00	0.00	1.00	0.00	1.00
Cross	0.06	0.24	0.00	0.00	0.00	0.00	1.00
BIG4	0.06	0.23	0.00	0.00	0.00	0.00	1.00
AUDCHG	0.13	0.34	0.00	0.00	0.00	0.00	1.00
LnDELAY	4.51	0.28	4.58	4.41	4.72	2.20	6.73
GC	0.38	0.19	0.00	0.00	0.00	0.00	1.00
ABN_ARL	0.20	0.40	0.00	0.00	0.00	0.00	1.00

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Table 4: Pearson Correlation

	LnFee	*PLEDGE*	*SIZE*	*INV*	*REC*	*ROA*	*LEV*	*INTAN*	*MtB*	*AGE*	*BOARD*
PLEDGE	0.03***	1									
SIZE	0.74***	-0.02***	1								
INV	0.01*	0.01**	0.05***	1							
REC	-0.09***	0.10***	-0.17***	-0.09***	1						
ROA	0.17***	-0.10***	0.31***	0.02***	-0.05***	1					
LEV	0.25***	0.02***	0.25***	0.30***	0.00	-0.18***	1		-0.18		
INTAN	0.04***	0.03***	0.00	-0.19***	-0.12***	-0.05***	0.01	1	0.03		
MtB	-0.20***	0.05***	-0.02***	-0.10***	0.03***	-0.09***	-0.19***	0.03***	1		
AGE	0.26***	0.09***	0.21***	0.05***	-0.08***	-0.01	0.11***	0.03***	0.06***	1	
BOARD	0.12***	-0.13***	0.17***	-0.01	-0.10***	0.06***	0.15***	0.02***	-0.15***	-0.05***	1
LnDELAY	0.16***	0.11***	0.06***	-0.03***	0.09***	-0.11***	0.00	0.01**	-0.03***	0.16***	-0.05***

Notes: All variables are defined in Appendix A. *, ** and *** denote 0.1, 0.05 and 0.01 significance levels, respectively, in a two-tailed test.

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Table 5: Regression results on the relationship between Audit Fees and Share Pledging

Variables	Expected Sign	*LnFee*				
		(1)	(2)	(3)	(4)	(5)
Intercept	?	3.903***	3.890***	3.912***	3.998***	3.990***
		(49.338)	(49.218)	(49.483)	(49.398)	(49.337)
PLEDGE	+	0.074***	0.144***	0.093***	0.057***	0.133***
		(7.962)	(11.685)	(9.539)	(5.320)	(9.770)
MainBoard	+	0.144***	0.169***	0.146***	0.144***	0.166***
		(21.504)	(23.189)	(21.785)	(21.487)	(22.792)
*PLEDGE *MainBoard*	-		-0.155***			-0.132***
			(-8.640)			(-7.144)
SOE	-	-0.058***	-0.061***	-0.047***	-0.057***	-0.051***
		(-9.631)	(-10.102)	(-7.511)	(-9.465)	(-8.216)
*PLEDGE *SOE*	-			-0.213***		-0.149***
				(-6.714)		(-4.555)
ABN_ARL					0.029***	0.030***
					(3.648)	(3.711)
*PLEDGE *ABN_ARL*					0.051***	0.039**
					(2.708)	(2.105)
SIZE	+	0.397***	0.397***	0.397***	0.396***	0.396***
		(127.143)	(127.196)	(127.093)	(126.831)	(126.855)
MERGER	+	0.072***	0.071***	0.071***	0.072***	0.071***
		(13.488)	(13.385)	(13.443)	(13.520)	(13.400)
INV	+	0.001	-0.001	-0.004	0.002	-0.002
		(0.037)	(-0.032)	(-0.177)	(0.104)	(-0.104)
REC	+	0.143***	0.137***	0.140***	0.143***	0.136***
		(5.388)	(5.186)	(5.298)	(5.395)	(5.160)
ROA	-	-0.399***	-0.392***	-0.400***	-0.370***	-0.367***
		(-8.134)	(-7.998)	(-8.175)	(-7.513)	(-7.466)
LEV	+	0.144***	0.138***	0.143***	0.141***	0.136***
		(9.617)	(9.219)	(9.603)	(9.458)	(9.109)
INTAN	+	0.320***	0.334***	0.327***	0.320***	0.336***
		(6.442)	(6.735)	(6.578)	(6.442)	(6.785)
MtB	+	-0.089***	-0.089***	-0.089***	-0.089***	-0.089***
		(-41.371)	(-41.335)	(-41.470)	(-41.288)	(-41.342)
AGE	-	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
		(-4.120)	(-3.461)	(-3.978)	(-4.201)	(-3.521)
DUAL	+	-0.003	-0.002	-0.002	-0.003	-0.002
		(-0.433)	(-0.406)	(-0.374)	(-0.433)	(-0.366)
BOARD	-	-0.001	-0.001	-0.001	0.000	0.000 (0.005)
		(-0.099)	(-0.088)	(-0.071)	(-0.016)	
Cross	+	0.504***	0.500***	0.501***	0.506***	0.501***
		(45.220)	(44.924)	(44.984)	(45.419)	(44.990)
BIG4	+	0.597***	0.595***	0.595***	0.598***	0.595***
		(51.424)	(51.357)	(51.319)	(51.479)	(51.355)
AUDCHG	-	-0.046***	-0.046***	-0.046***	-0.047***	-0.046***
		(-6.473)	(-6.423)	(-6.499)	(-6.561)	(-6.527)
LnDelay	+	0.114***	0.114***	0.114***	0.094***	0.095***
		(12.432)	(12.441)	(12.374)	(9.495)	(9.536)
GC	+	0.089***	0.091***	0.088***	0.081***	0.082***
		(6.455)	(6.574)	(6.407)	(5.838)	(5.949)
Industry		Yes	Yes	Yes	Yes	Yes
Year		Yes	Yes	Yes	Yes	Yes
N		30,950	30,950	30,950	30,950	30,950
Adj. R-squared		0.7406	0.707	0.707	0.707	0.707
F-test		1,460***	1,437***	1,435***	1,407***	1,362***

Notes: This table reports the estimated coefficients of the regression equation. *, ** and *** denote 0.1, 0.05 and 0.01 significance levels, respectively, in a two-tailed test. Numbers in parentheses are t-statistics. All variables are defined in Appendix A.

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Table 6: 2SLS Instrumental Variable regression results

Variables	IV is *M_PLEDGE*		IV is *P_PLEDGE*	
	First Stage Pledge (1)	**Second Stage LnFee (2)**	**First Stage Pledge (1)**	**Second Stage LnFee (2)**
Intercept	0.030 (0.902)	3.906*** (49.360)	0.063* (1.945)	3.907*** (49.363)
M_PLEDGE	0.859*** (189.139)			
P_PLEDGE			0.880*** (191.553)	
PLEDGE		0.039*** (3.029)		0.026** (2.075)
Controls	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	22,207	22,207	22,207	22,207
R2 Adj.	0.635	0.695	0.638	0.695
K-Paap-LM stat.	7718.27 (0.000)		7,952.19 (0.000)	
Cragg-Donald Wald F	36,000***		37,000***	
K-Paap Wald F stat.	18,000***		19,000***	
Wu-Hausman	9.59***		24.86***	
Stock-Yogo critical Value at 10%	16.38***		16.38***	

Notes: This table reports the estimated coefficients of the regression equation. *, ** and *** denote 0.1, 0.05 and 0.01 significance levels, respectively, in a two-tailed test. Numbers in parentheses are t-statistics. All variables are defined in Appendix A.

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Table 7: Entropy balancing approach

Panel A: Covariate balance

Variables	Weight variable before entropy balancing						Weight variable after entropy balancing					
	Treated			Control			Treated			Control		
	Mean	Variance	Skewness	Mean	Variance	Skewness	Mean	Variance	Skewness	Mean	Variance	Skewness
SIZE	22.7	0.9006	0.6481	22.73	1.359	0.6605	22.7	0.9006	0.6481	22.7	1.076	0.7085
MERGER	0.3417	0.225	0.6676	0.3784	0.2352	0.5012	0.3417	0.225	0.6676	0.3417	0.225	0.6675
INV	0.1491	0.01938	2.153	0.1531	0.02008	1.839	0.1491	0.01938	2.153	0.1491	0.0173	2.098
REC	0.137	0.0112	0.9196	0.1081	0.01007	1.282	0.137	0.0112	0.9196	0.137	0.01203	1.002
ROA	0.1633	0.003704	-2.161	0.1713	0.002952	-2.561	0.1633	0.003704	-2.161	0.1633	0.003903	-2.09
LEV	0.4255	0.04186	0.2767	0.4464	0.0467	0.1568	0.4255	0.04186	0.2767	0.4255	0.05152	0.353
INTAN	0.04709	0.002516	2.863	0.04452	0.002691	2.802	0.04709	0.002516	2.863	0.0471	0.002494	2.72
MtB	2.135	1.749	2.474	1.911	1.581	2.95	2.135	1.749	2.474	2.135	1.917	2.492
AGE	16.13	31.42	0.3958	15.44	36.57	0.2992	16.13	31.42	0.3958	16.13	41.46	0.6446
DUAL	0.3323	0.2219	0.712	0.1993	0.1596	1.505	0.3323	0.2219	0.712	0.3323	0.2219	0.7122
BOARD	2.099	0.04106	-0.5186	2.17	0.04327	-0.5012	2.099	0.04106	-0.5186	2.099	0.04205	-0.8899
SOE	0.109	0.09714	2.509	0.4339	0.2456	0.2667	0.109	0.09714	2.509	0.1091	0.09723	2.507
MainBoard	0.297	0.2088	0.8883	0.7442	0.1904	-1.119	0.297	0.2088	0.8883	0.2971	0.2089	0.8878
Cross	0.01351	0.01333	8.427	0.08111	0.07453	3.069	0.01351	0.01333	8.427	0.01362	0.01343	8.393
BIG4	0.01844	0.0181	7.16	0.07517	0.06952	3.223	0.01844	0.0181	7.16	0.0185	0.01816	7.146
AUDCHG	0.1207	0.1061	2.329	0.1414	0.1214	2.059	0.1207	0.1061	2.329	0.1207	0.1061	2.329
LnDelay	4.558	0.06609	-2.218	4.492	0.07902	-1.962	4.558	0.06609	-2.218	4.558	0.05861	-1.745
GC	0.04248	0.04068	4.537	0.03542	0.03417	5.027	0.04248	0.04068	4.537	0.04249	0.04068	4.537

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Table 7: Entropy balancing approach

Panel B: Share pledging and audit fees after entropy balancing

Variables	Expected Sign	DV = LnFee
Intercept	?	4.409*** (37.93)
PLEDGE_Dummy	+	0.031*** (4.70)
Controls		Yes
Industry		Yes
Year		Yes
N		30,950
Adj. R-squared		0.625
F-test		468***

Notes: This table reports the estimated coefficients of the regression equation. *, ** and *** denote 0.1, 0.05 and 0.01 significance levels, respectively, in a two-tailed test. Numbers in parentheses are t-statistics. All variables are defined in Appendix A.

Table 8: Difference-in-Difference analysis

Variables	Expected Sign	DV = LnFee
Intercept	?	3.729*** (47.242)
PLEDGE	+	0.039** (2.347)
Post	+	0.225*** (31.315)
PLEDGE *Post	+	0.063*** (3.210)
Controls		Yes
Industry		Yes
N		30,950
Adj. R-squared		0.686
F-test		1,776***

Notes: This table reports the estimated coefficients of the regression equation. *, ** and *** denote 0.1, 0.05 and 0.01 significance levels, respectively, in a two-tailed test. Numbers in parentheses are t-statistics. All variables are defined in Appendix A.

Table 9: Regression results on the relationship between Audit Fees and Share Pledging (dummy variable)

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Variables	Expected Sign	Share Pledging Proportion				
		>0% (1)	10% (2)	20% (3)	30% (4)	50% (5)
Intercept	?	3.908*** (49.361)	3.905*** (49.327)	3.904*** (49.316)	3.903*** (49.323)	3.908*** (49.412)
PLEDGE_Dummy	+	0.021*** (3.347)	0.029*** (4.640)	0.035*** (5.555)	0.044*** (6.766)	0.062*** (8.256)
Controls		Yes	Yes	Yes	Yes	Yes
Industry		Yes	Yes	Yes	Yes	Yes
Year		Yes	Yes	Yes	Yes	Yes
N		30,950	30,950	30,950	30,950	30,950
Adj. R-squared		0.706	0.706	0.706	0.706	0.706
F-test		1456***	1457***	1458***	1459***	1460***

Notes: This table reports the estimated coefficients of the regression equation. *, ** and *** denote 0.1, 0.05 and 0.01 significance levels, respectively, in a two-tailed test. Numbers in parentheses are t-statistics. All variables are defined in Appendix A.

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