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Does share pledging promote or impede corporate social responsibility? An examination of Chinese listed firms

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ABSTRACT

By employing the Chinese listed firm's data from 2010 to 2017, this study explores the impact of share pledging on firms' corporate social responsibility (CSR) performance. Empirical results indicate a negative relationship between share pledging and CSR performance. This effect is robust after using alternative measures and different regression methods, and also consistent after tackling the endogenous issues. Furthermore, we find that risk-taking and agency cost are two possible underlying mechanisms through which share pledging reduces CSR. In addition, CSR reduction caused by share pledging leads to poorer economic performance and lower market value of firms.

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Share pledging; Agency cost; Corporate social responsibility

1. Introduction

The practice of share pledging has become a global phenomenon (Dou et al., 2019). Extensive literature has documented that debt financing is often paralyzed by the typical information asymmetry friction (Mann, 1997; David et al., 2008). To mitigate the informational asymmetry friction and the related contractual friction involved in the use of debt financing, collateral has become a widely used mechanism (Mann, 2018; Williamson, 1988; Inderst & Mueller, 2007). The form of collateral varies largely, including but not limited to machines, lands, patents, shareholdings, and other valuable properties (Mann, 1997; Williamson, 1988; Benmelech & Bergman, 2008; Tang, Yang, and Boehle 2018). Share pledging has become a popular tool for shareholders to obtain loans. According to Larcker and Tayan (2010) survey, 44% of total U.S. holdings were pledged through 2006–2009. Evidence from Taiwan, India, and China also demonstrated that a large portion of holdings has been pledged in these markets (Chan et al., 2018; Li et al., 2019).

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Share pledging has garnered attention from regulators and participates worldwide. However, share pledging by insiders, particularly the controlling shareholders who dominate the firm and make important decisions regarding the corporate strategy and operation, is largely ignored in academia. One important reason is that datasets about share pledges in most western countries are unavailable. Thus, the question of how share pledging changes controlling shareholders' incentives and subsequently influences corporate activities remains unanswered. In recent years, several studies started exploring this important question based on the availability of data, and most of which were obtained from the Asian region, and provided some critical insights (Chan et al., 2018; Asija et al., 2016; Li et al., 2019; Chan et al., 2013; Kim et al., 2014). For instance, Chan et al. (2018) developed and tested the margin call hypothesis, finding that controlling shareholders may initiate share repurchases to fend off potential margin calls associated with pledged shares to maintain their control rights. Wang and Chou (2018) investigated the impact of share pledging on stock trading and firm valuation.

This study tends to link share pledging with corporate social responsibility (CSR). Previous studies constantly documented that CSR is crucial for firms to build up competitive advantages and maintain long-term growth (Friedman, 2007; Hou, 2019; Pava & Krausz, 1996). For instance, engagement in CSR could improve firms' reputation (Krüger, 2015), value (Servaes & Tamayo, 2013), growth, and sales (Lins et al., 2017), etc. Although the literature has demonstrated the importance of investigating factors that influence CSR, the question of whether and how share pledging would influence CSR is still under-investigated. Once stocks were pledged by controlling shareholders, these shareholders have to face the pressure of margin calls (Chan et al., 2018) and forced sales (Chan et al., 2018), which further result in the switch of corporate control rights. To avoid margin calls and forced sales, firm needs to maintain the stock price level or deposit more funds. Firms can adopt various methods to mitigate forced sales. For example, firms might use resources, particular slack monetary resources, to buy back stocks to provide price support or prevent a further reduction. Thus, a substitution effect for CSR activities might exist because firms might reduce or cut off resources investing in CSR. However, complementary effect might exist. For instance, to alleviate the negative signal effect of share pledging to market, signaling that the firm might be constrained by finance, and the subsequent stock price reduction, the pledged firm might engage in more CSR because CSR may act as a positive signal to prevent the stock price crash risk (Min, Lu, and Xu 2016). It is thus likely that share pledging of controlling shareholders could promote CSR.

To date, whether share pledging impedes or promotes firms' CSR remains unclear. The Chinese stock market provides a unique opportunity to explore the relationship between share pledging and CSR. At first, most of the share pledging belongs to private behavior and is not disclosed in public in the U.S. and other developed countries. However, the China Securities Regulatory Commission (CSRC) requires listed firms to disclose information about share pledging for the shareholders with greater than 5% shareholding. This compulsory disclosure gives us access to share pledging data and provides a suitable setting to analyze the impact of share pledging on firms' CSR performance. Second, anecdotal evidence shows that most largest shareholders

pledge shares to pursue personal consumption or repurchase stocks in the U.S. (Dou et al., 2019), while large shareholders typically employ loans to reinvest in the firms' operation, which might be beneficial for firms' operation (Singh, 2018) in emerging markets, such as China. Thus, this phenomenon might influence the involved firms' strategy and operation.

By employing the Chinese listed firms from 2010 to 2017, this study examines the effect of share pledging, measured by the pledging ratio of the largest shareholder, on firms' CSR performance. The empirical results show that firms with higher share pledging would perform poorly in CSR. This relationship is still valid after addressing possible endogenous problems and remains robust when alternative measurement and regression methods are utilized. Moreover, the impact of share pledging is more pronounced in firms with high agency costs and high risk-taking inclination. Furthermore, we still find that the CSR decrease, resulted by share pledging, would finally damage firms' economic performance.

Our paper contributes to the existing literature in several ways. First, our paper extends the existing literature on share pledging and focuses on the CSR decisions made by firms' controlling shareholders. The existing literature related to share pledging mainly focuses on the effect of share pledging on stock trading, firm values, and innovations (Li et al., 2019; Wang & Chou, 2018; Ouyang et al., 2019). Only minimal emerging literature gives attention to the influence on corporate decisions, but complete conclusions have not been presented. Second, to the best of our knowledge, this is the first paper that seeks to figure out the relationship between share pledging and firms' CSR performance, which extends the boundary of CSR antecedents. Third, our study also contributes to the literature via exploring the underlying mechanisms; we reveal that stronger agency cost and more risk-taking are two possible underlying mechanisms through which share pledging affects firm's CSR investment. Finally, our results contribute to the literature about how share pledging affects firm performance and firm values, and indicate that the controlling shareholders pledge their shares and restrict the CSR investment, finally driving the poor economic performance.

The remainder of this paper is organized as follows. [Section 2](#) reviews the literature and develops the hypotheses. [Section 3](#) describes the data and methods. [Section 4](#) reports the empirical results. [Section 5](#) presents the conclusions.

2. Literature review and hypothesis development

The CSR literature has undergone constant evolution in accordance with its research foci. Most of these studies believe that CSR could improve firms' reputation, increase the product market competition, improve the relationship with government (Orlitzky et al., 2003; Wang et al., 2016; Wright & Ferris, 1997; Lu et al., 2020), and ultimately lead to increased firm value. In addition, CSR is a crucial strategy for firms' long-term development (Freeman, 1983) and attracts increasing attention from researchers.

In the extant literature about CSR, the motivation of CSR has gained considerable attention. Previous studies analyzed this topic from external and internal aspects.

External motivations are more related to the relationships between firms and society. Stevens et al. (2005) state that corporates engage in CSR due to pressures from

stakeholders, including outside shareholders (David et al., 2007), media (Weaver et al., 1999), local community (Marquis et al., 2007), and interest groups (Greening & Gray, 1994). Liang and Renneboog (2017) emphasize that legal origin is a significant driving factor of CSR, and they find that firms from common law countries have significantly lower CSR than firms from civil law countries. Pineiro-Chousa et al. (2019) emphasize the financial development of the country's market where the firm places will affect the firm's standardized reporting, including the reports on CSR. They conclude that only the high-income developed markets or emerging markets present a high number of companies which provide standardized CSR reporting.

Regarding the internal motivations, existing studies have suggested that many factors could affect firms' CSR. First, CEO or director characteristics can play an important role in firms' CSR performance (Wood et al., 1986; Swanson, 2008; Davidson et al., 2019; Di Giuli & Kostovetsky, 2014; Huang, 2013). Second, firms' attributes also have an impact on CSR strategies and practices. Neubaum and Zahra (2006) and Dyck et al. (2019) show that institutional shareholders could improve firms' social performance. Kassinis and Vafeas (2006) report that varying outside shareholders' characteristics are correlated to different levels of CSR. Controlling shareholders can be beneficial to corporate governance but can also expropriate firm's assets if they are engaged in the firm's management (Courteau et al., 2017; Pineiro-Chousa et al., 2016). Thus, Pucheta-Martínez and López-Zamora (2018) point out that controlling shareholders' representatives on boards can affect firms' CSR activities, based on the evidence using Spanish data. Third, Banerjee et al. (2020) find that environmentally sustainable practice, which is an important part of CSR, can reduce firms' financial constraints. In addition, Banerjee et al. (2019) and Girella et al. (2019) compare the external country determinants and internal firm determinants together on firms' environmentally sustainable outcomes. They also point out that country-level factors and firm-level factors jointly have higher explanatory power on firms' CSR practices and the reporting.

As firms engaging in share pledging account for a large proportion in financial markets, the extant literature has paid increasing attention to share pledging. Share pledging functions are considered as a financing tool for firms to obtain loans from banks or other financial institutions (Chan et al., 2018).

According to the definition of share pledging, the actor of pledging is a personal entity, such as controlling shareholders. Previous studies have provided facts and theoretical arguments to link personal financial behaviors to the corporate level. Since the controlling shareholders play a dominant role in firm's decision process and have sufficiently large ownership, the pledging behavior of controlling shareholders thus has a significant effect on firm activities (Chan et al., 2018; Claessens et al., 2002; Faccio & Lang, 2002). In addition, controlling shareholders exert influence on board directors. Their actions may also be supported by the top management team because it seems reasonable for management members to align their incentives and activities with the controlling shareholders. Once the controlling shareholders lose their control, the management team will also run the risk of losing their seats because new controlling shareholders might dismiss or reorganize the top management team.

The effect of share pledging on firms has also received considerable attention. Similar to other forms of collateral, share pledging would help borrowers to collect loans from the debt market, which might alleviate the borrowers' financial shortage. This effect might benefit borrowers. However, share pledging may also leave the firm exposed to more risk (Chan et al., 2018; Dou et al., 2019).

First, firm value will be significantly affected if firms' inside shareholders pledge shares for personal loans (Dou et al., 2019; Singh, 2018). Next, a few papers extend the literature on share pledging and discuss the corporate decisions affected by share pledging. Besides, Huang and Xue (2016) focus on firms' financial reporting behaviors in the Chinese market. They note that after the split share reform, share pledging firms smooth their earnings more than other firms. However, how firms' behaviors, including CSR activities, are affected by share pledging has not been thoroughly discussed. Thus, our paper contributes to the share pledging literature and seeks to determine whether and how share pledging influences firms' CSR performance.

Here, we argue that to avoid the margin call, firms with more pressure might engage in more CSR activities to lighten the impact of stock price crash risk caused by share pledging. Share pledging is a type of margin loan, and a price decline would trigger the marginal call. If the borrower cannot meet the marginal calls, the stock will sell by the lenders. This phenomenon exerts additional short-selling pressure and leads to a higher stock price crash risk (Dou et al., 2019). Therefore, in the event that the stock price will fall to the level near to required maintenance line, controlling shareholders might use all their power and resources to support the stock price (Chan et al., 2018). One possible method is to engage in more CSR activities. Share pledging sends out the signal that the firm's financial resources are constrained, which would evoke an adverse reaction from the stock market. To relieve this negative signal, firm might send out another positive signal by engaging in more CSR activities. Kim et al. (2014) and Zhang et al. (2016) document that CSR would alleviate the impact of stock price crash risk such that firms may have an incentive to engage more CSR to alleviate the impact of stock price decline. This finding is attributed to the fact that socially responsible firms maintain high standards of transparency and are less likely to withhold negative information, such as the share pledging, in this study from investors. Thus, these arguments lead to hypothesis H1a.

H1a: Firms with share pledging by controlling shareholders will have better CSR performance than other firms.

Meanwhile, some theoretical arguments also suggest that share pledging might reduce firms' CSR by reducing risk-taking and long-term investment. Share pledging can discourage corporate risk-taking (Dou et al., 2019; Chan et al., 2018; Meng et al., 2019). The risk-averse corporate insiders with pledged shares tend to be myopic and refuse to invest in CSR behaviors. Additionally, insider executives' incentives will be affected by share pledging behaviors due to agency problems (Wang & Chou, 2018). Controlling shareholders might employ share pledging to pursue personal benefits while neglecting CSR investments. Thus, these arguments raise our second hypothesis, which contrasts with H1a. Whether share pledging promotes or impedes firms' CSR performance remains an empirical issue.

H1b: Firms with share pledging by controlling shareholders will have worse CSR performance than other firms.

3. Methodology

3.1. Sample selection

CSR information is collected from the social responsibility report database constructed by 'Hexun' website¹, and this CSR rating is widely used in CSR research about China (Huang, 2018; Hu et al., 2018; Wang et al., 2019). The remaining financial information is acquired from the Chinese Stock Market and Accounting Research Database (CSMAR).

For sample selection, we employ the A-share stocks in China from 2010 to 2018 as the sample. The CSR information on the 'Hexun' website begins in 2010, so our sample period starts from 2010. First, we excluded the firms with special treatment, including ST, *ST, and PT. Then, corporations in the financial industry are deleted because the financial statements in the financial industry are greatly different from those in other industries. Next, firms with abnormal values, such as negative operating revenue and leverage greater than 1, are excluded. Finally, we eliminate the observations with missing variables and acquire a sample with 2,459 firms and 11,249 firm-year observations. In addition, all the variables are winsorized at the 1% level each year to alleviate the impact of extreme values.

3.2. Variable definition

This study employs the CSR score information from 'Hexun' as the main dependent variable. The CSR score measures firms' social responsibility from five categories: shareholders, supplier & customer, employees, society, and environment. There are other kinds of CSR database, e.g., 'Runling' database. But 'Runling' only covers a small number of firms and does not disclose the detailed CSR score and calculation procedure. Thus, this paper utilizes 'Hexun' CSR as the proxy for CSR, which is a widely applied measure in recent studies (Gong et al., 2020; Hu et al., 2018; Wang et al., 2019; Xu et al., 2019). Besides, we utilize the society and environment scores as an alternative measure for CSR.

Some recent studies harness the ratio of share pledging, freezing and equity custody of the largest shareholder as the proxy for share pledging (Li et al., 2019). But this ratio includes the share freezing, equity custody and may has some bias on measuring share pledging. Accordingly, we only employ the pledging ratio of the largest shareholder as the main explanatory variable. However, we also choose the ratio of share pledging, freezing and equity custody as the alternative measure for share pledging. For the control variables, we control the firm-level characteristics, including firm size (*Size*), financial leverage (*Lev*), firm age (*Age*), sale growth (*Growth*), cash holding (*Cash*), shareholding percentage of largest shareholder (*Top1*), state ownership (*State*), institutional ownership (*Institutional*), number of board directors (*Board Size*), number of board meetings (*Board Meeting*), board independence (*Independence*), analyst following (*Analyst*). In addition, we also control the *industry*, *province*, and *year* fixed effect to control the unobservable factors associated with the industry, province, and year. All variable definitions are presented in Table 1.

Table 1. Variable definition.

Type	Variable	Definition
Dependent	CSR	Total corporate social responsibility score in year $t + 1$, which include the category of shareholder, supplier & customer, employees, society, and environment
Independent	CSR2	The CSR score of society and environment
	Pledge	The share pledging ratio of largest shareholders
	Pledge2	The total ratio of share pledging, freezing and equity custody of the largest shareholder
Control	Size	Firm size, measured as the natural logarithm of market value
	ROA	Return on assets, which is the net earnings to total assets
	Leverage	Financial leverage, proxied as the ratio of total liabilities to total assets
	Firm Age	The number of years that firms have been listed
	Growth	Sales growth rate calculated as the ratio of sales in the current year to sales in the last year minus one
	Cash	Cash and cash equivalents scaled by total assets
	Top1	The shareholding percentage of the largest shareholder
	State	A dummy variable and equals one if a firm is the state-owned enterprise
	Institutional	The ownership percentage of institutional shareholders
	Board Size	The natural logarithm of the number of board directors
Other	Board Meeting	The natural logarithm of the number of board meetings
	Independent	The ratio of independent directors in the director board
	Analysts	The natural logarithm of one plus the number of analysts
	Divergance	The divergence between cash flows rights and controlling rights, which is the ratio of controlling rights to cash flow rights of the actual controller. A larger Separation value denotes a higher agency cost
	ROAsd	ROA Volatility, which is utilized as a proxy for risk-taking, is the standard deviation of Firms' ROA during year t to $t-2$.
	Tobin Q	The ratio of market value plus total debts to total assets

Source: The Authors.

3.3. Research design

Equation 1 is designed to examine the impact of the share pledge on firms' CSR. By carrying out the Ordinary Least Squares (OLS) regression on equation 1, we can verify our first hypothesis if coefficient β is negative and significant.

$$CSR_{i,t+1} = \alpha + \beta Pledge_{i,t} + \gamma Control_{i,t} + \sum Year + \sum Industry + \sum Province + \varepsilon_{i,t} \quad (1)$$

4. Empirical results

4.1. Summary statistics

The descriptive statistics for all variables are presented in Panel A of Table 2. The average total CSR score for sample firms is 28.06. For the category of environment and society, sample firms have an average score of 7.46. The largest shareholder of sample firms has an approximately 0.4% pledging ratio but a large standard deviation of 3.8%. And they have about 24.6% ratio of share pledging, freezing and equity custody. In addition, sample firms have approximately 5.1% return on assets, 42.6% financial leverage, 21.3% sale growth rate, 16.5% cash holding, 7.76% institutional

Table 2. Summary statistics.

Panel A: Description statistics						
variable	N	mean	sd	min	max	
CSR _{t+1}	11,249	28.06	17.53	-4.830	80.95	
CSR2 _{t+1}	11,249	7.460	7.411	-10	33.33	
Pledge	11,249	0.00400	0.0380	0	1	
Pledge2	11,249	0.246	0.346	0	1	
Size	11,249	22.97	1.126	20.32	28.73	
ROA	11,249	0.0510	0.0390	-0.0100	0.209	
Lev	11,249	0.426	0.198	0.0460	0.850	
Growth	11,249	0.213	0.386	-0.481	3.596	
Cash	11,249	0.165	0.121	0.0120	0.649	
Age	11,249	10.05	6.293	2	25	
State	11,249	0.430	0.495	0	1	
Institutional	11,249	7.760	7.658	0	40.40	
Board size	11,249	2.158	0.199	1.099	2.890	
Meeting	11,249	2.208	0.397	0	4.043	
Independent	11,249	0.372	0.0550	0.125	0.800	
Analysts	11,249	1.824	1.096	0	3.850	
Top1	11,249	0.363	0.151	0.0360	0.894	
Divergence	10,957	5.114	7.991	0	49.40	
ROA sd	11,249	0.0160	0.0180	0	0.274	

Panel B: Pearson correlation matrix (Part I)							
	1	2	3	4	5	6	7
1. CSR	1						
2. Pledge	-0.012	1					
3. Size	0.285***	-0.025***	1				
4. ROA	0.260***	-0.003	0.042***	1			
5. Lev	0.103***	0.01	0.466***	-0.391***	1		
6. Growth	0.025***	-0.015	0.055***	0.124***	0.064***	1	
7. Cash	0.060***	-0.005	-0.188***	0.289***	-0.389***	-0.018*	1
8. Age	0.110***	0.018*	0.355***	-0.110***	0.341***	-0.081***	-0.144***
9. State	0.200***	0.002	0.318***	-0.115***	0.291***	-0.105***	-0.069***
10. Institutional	0.165***	-0.016*	0.225***	0.258***	0.045***	0.087***	0.096***
11. Board size	0.139***	0.015	0.213***	-0.011	0.154***	-0.042***	-0.070***
12. Meeting	0.002	-0.016*	0.213***	-0.112***	0.244***	0.144***	-0.100***
13. Independent	-0.001	-0.005	0.073***	-0.025***	0.017*	0.008	0.017*
14. Analysts	0.268***	-0.028***	0.411***	0.395***	0.029***	0.112***	0.063***
15. Top1	0.127***	-0.020**	0.228***	0.052***	0.114***	-0.023**	-0.005

Panel C: Pearson correlation matrix (Part II)							
	8	9	10	11	12	13	14
8. Age	1						
9. State	0.463***	1					
10. Institutional	0.039***	-0.013	1				
11. Board size	0.136***	0.278***	0.018*	1			
12. Meeting	0.047***	-0.078***	0.092***	-0.040***	1		
13. Independent	-0.043***	-0.033***	0.008	-0.485***	0.064***	1	
14. Analysts	-0.117***	-0.027***	0.465***	0.110***	0.114***	0.013	1
15. Top1	0.002	0.243***	-0.144***	0.037***	-0.069***	0.059***	0.046***

Note *, **, *** represent that coefficient is significant at 10%, 5% and 1% level, respectively.

Source: The Authors.

ownership, 37.2% board independence, and 36.3% largest shareholding. In addition, 43% of sample firms are state-owned enterprises.

Next, we present the correlation analysis in Panel B of Table 2. *Pledge* has a negative coefficient with *CSR*, indicating that a higher pledge ratio is associated with a lower *CSR*. The largest coefficient among all variables is 0.466 between leverage and size. This value is less than 0.5, so the multicollinearity problem is not severe in our

Table 3. Main result.

VARIABLES	(1)	(2)
	CSR _{t+1}	CSR _{t+1}
Pledge	-14.299*** (5.475)	-9.163** (4.441)
Size		4.168*** (0.308)
ROA		80.343*** (6.454)
Leverage		-2.706* (1.478)
Growth		0.648* (0.372)
Cash		4.082** (1.757)
Age		0.078* (0.042)
State		2.220*** (0.585)
Institutional		-0.010 (0.029)
Board Size		1.862 (1.306)
Board Meeting		-1.056** (0.483)
Independent		2.602 (4.173)
Analysts		1.280*** (0.223)
Top1		-0.093 (1.559)
Constant	28.093*** (0.256)	-78.065*** (7.173)
Observations	11,081	11,081
Adjusted R-squared	0.195	0.334
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	6.820	66.87

Note: Standard errors are adjusted by clustering at the firm level and reported in parentheses. *, **, *** represent that coefficient is significant at 10%, 5% and 1% level, respectively.

Source: The Authors.

model. More specifically, the mean VIF of [equation 1](#) is 1.46 and less than 5, implying there is no multicollinearity concern in the main regression (Ryan, 2009).

4.2. Main regression result

To examine the impact of share pledging on firm's CSR, we run the Ordinary Least Squares (OLS) regression based on [Equation 1](#). The baseline result is shown in columns 1 and 2 of [Table 3](#). In Column 1, we first regress Pledge on CSR without control variables. Column 2 shows the regression results of the full model. The industry, year, and province fixed effects are controlled in both regressions. The adjusted R-squared value is 0.195 in Column 1 and 0.334 in Column 2, indicating a good explanatory power of our model for CSR. Both F-values are greater than 3.85 (5% significance value), showing the significance of the model.

The coefficient of *Pledge* is -9.163 and significant at 1% level in Column 2, implying that a higher pledge ratio reduced firms' CSR. Specifically, if share pledging increases one standard deviation, firms would have 2% lower CSR score. In other words, share pledging could restrict firm's CSR investment, and this result is consistent with our first hypothesis.

Regarding control variables, *Size*, *ROA*, *Cash*, *Growth*, *Age*, and *Analyst* have significantly positive coefficients, illustrating firms with large size, higher earnings, cash holding, sales growth rate, firm age, and analysts coverage are more likely to engage in CSR activities. *State* also presents a positively coefficient, indicating that state-owned enterprises invest more in CSR. In addition, *Leverage* and *Board Meeting* present negatively significant coefficients, showing that a higher debt ratio and frequent board meeting would lead to lower CSR performance.

4.3. Additional analysis

4.3.1. Underlying mechanism

In our study, we hypothesize that risk-taking and agency cost are two possible channels through which pledge affects CSR.

Previous studies show that share pledging could reduce firms' risk-taking (Dou et al., 2019; Chan et al., 2018; Meng et al., 2019). More specifically, corporations would become more risk-averse after pledging shares and be reluctant to invest in long-term CSR investments. If this hypothesis is tenable, firms' risk-taking should be significantly reduced after firms pledge shares. This phenomenon should be stronger in firms with high risk-taking because there is lesser reduction space for firms with low risk-taking. Therefore, the effect of share pledging should be more substantial in firms with high-risk taking. To examine this hypothesis, this paper follows Faccio et al. (2016) to utilize ROA volatility as a proxy for risk-taking and divides the sample into two parts according to the median value of ROA volatility. Next, regression analysis is performed in the two subgroups. Empirical results are shown in Panel A of Table 4, and *Pledge* is only negatively significant in the high risk-taking group. This result indicates that share pledging's negative effect on CSR is more pronounced in firms with high risk-taking.

Another underlying mechanism is firms' agency cost. In the hypothesis analysis, share pledging would reduce firms' CSR due to agency problems (Wang & Chou, 2018). The impact of share pledging should be more substantial in firms with higher agency costs. This paper utilizes the separation of voting rights and ownership as the proxy of agency cost and a higher level of separation denotes a higher agency cost. Next, the sample is separated into two subgroups, and the regression result is shown in Panel B of Table 4. *Pledge* is only significant in the high-separation group, which is consistent with our expectations. This result indicates that share pledging's impact is stronger in firms with high agency costs.

Combining the results, this paper suggests that high agency cost and high risk-taking are two possible underlying mechanisms through which share pledging reduces CSR.

Table 4. Mechanism analysis.

Panel A: Impact of risk-taking

VARIABLES	(1)	(2)
	Low Risk-taking CSR $t + 1$	High Risk-taking CSR $t + 1$
Pledge	1.865 (7.574)	-18.635*** (3.062)
Constant	-70.278*** (8.713)	-89.867*** (8.871)
Observations	5,579	5,502
Adjusted R-squared	0.338	0.341
Control	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	39.26	54.26

VARIABLES	(1)	(2)
	Low Divergence CSR t_{+1}	High Divergence CSR t_{+1}
Pledge	-4.902 (7.425)	-14.423*** (4.532)
Constant	-75.469*** (7.561)	-104.865*** (8.664)
Observations	6,121	4,960
Adjusted R-squared	0.343	0.333
Control	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	46.49	54.94

Note: Standard errors are adjusted by clustering at the firm level and reported in parentheses. *, **, *** represent that coefficient is significant at 10%, 5% and 1% level, respectively.

Source: The Authors.

4.3.2. Impact on firm performance

Many studies have outlined that share pledging might harm firm value (Li et al., 2019). However, the mechanisms linking share pledging to firm value significantly vary (e.g., increased agency cost). Anderson and Puleo (2015) show that the largest shareholder might damage the interest of other shareholders, strengthening the agency cost. In this study, we argue that share pledging will result in the reduction of CSR, which would subsequently harm firm performance since CSR is important for firm performance. Meanwhile, we also realize that financial performance is different from the firm value (normally measured by *Tobin's Q* ratio). Thus, we conduct supplementary analyses to explore how share pledging impacts firm performance, measured by *ROA*, and firm value.

Panel A of Table 5 presents the regression result of the effect of share pledging on *ROA*. The coefficient of ΔCSR is positive and significant at the 10% level, showing that the reduction in CSR is detrimental to firms' *ROA* in firms with high share pledging. In other words, the CSR reduction caused by share pledging would lead to

Table 5. Impact of CSR change on firm performance.

Panel A: Impact of CSR change on firm performance		
VARIABLES	(1) ROA _{t+1}	(2) ROA _{t+1}
ΔCSR	0.007*** (0.003)	0.007*** (0.003)
Constant	4.078*** (0.081)	-4.280** (2.055)
Observations	10,294	10,294
Adjusted R-squared	0.043	0.206
Control	No	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	7.054	85.35
Panel B: Impact of CSR change on firm value		
VARIABLES	(1) Tobin Q _{t+1}	(2) Tobin Q _{t+1}
ΔCSR	0.007*** (0.001)	0.004*** (0.001)
Constant	1.894*** (0.026)	7.309*** (0.596)
Observations	10,019	10,019
Adjusted R-squared	0.285	0.498
Control	No	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	98.57	124.6

Note: Standard errors are adjusted by clustering at the firm level and reported in parentheses. *, **, *** represent that coefficient is significant at 10%, 5% and 1% level, respectively.

Source: The Authors.

poorer economic performance. Panel B of Table 5 presents the regression results of the effect of share pledging on Tobin's Q ratio. ΔCSR has significantly positive coefficients, indicating that the CSR change has a negative impact on firms' long-term performance. Thus, share pledging reduces firms' engagement in CSR activities and ultimately damages the firm performance and firm value.

4.4. Address the endogeneity

There might be some endogenous problems with our main analysis. For example, firms that engage in lesser CSR investment may be more likely to pledge their shares, which causes the reverse causality problem. Besides, some unobservable factors, like the largest shareholder's characteristics, might affect the relationship between share pledging and CSR, driving the omitted variable problems. These endogenous concerns might drive a bias estimation for the relationship between share pledging and CSR. If a shareholder anticipates lesser CSR investments in future, they might be more likely to pledge their shares to acquire personal benefits. To address the possible endogenous concern, we carry out the difference in difference analysis (DiD) and instrument variable regression.

4.4.1. Difference-in-difference analysis

At first, we utilize the share pledging reform in 2013 as a natural experiment in our examinations (Meng et al., 2019). Prior to 2013, only trust firms and banks can engage in the share-pledging business. This regulation allows the security firms to loan to shareholders by utilizing the stocks as collateral. Compare with banks, security companies provide a lower interest rate, faster approval speed, and lesser restrictions on loan usage. Thus, this reform significantly promotes share pledging. According to this reform, firms in the regions with more securities firm funding are easier to acquire the loans. If a province has more securities firm funding, measured as the stock trading volume, than the median level in 2013, we set the firms whose head-quarter is located in this province as the treated firms ($Treat = 1$). Next, we set a $Post$ as one if the year is after 2013. In this DiD setting, the regional securities companies' size is unlikely to affect firm's CSR investment through other ways.

In Panel A of Table 6, $Treat \times Post$ presents a negatively significant coefficient, indicating that share pledging restricts firm's CSR investment. This result is consistent with our main result, and the impact of share pledging on CSR is casual. Moreover, we examine the parallel trend assumption of difference in difference regression and construct seven dummy variables to represent the year $-3, -2, -1, 0, +1, +2, +3$. In Panel B of Table 6, only $+2$ and $+3$ have significant coefficients, implying that the share pledging reform substantially reduces the CSR since the second year after the reform. Besides, $-3, -2,$ and -1 all present insignificant coefficients, showing that there is no material difference between treated firms and control firms before the reform. In other words, our DiD analysis meets the parallel trend assumption, and indicates that share pledging has a negatively casual impact on firm's CSR investment.

4.4.2. Instrumental regression

In this section, we utilize instrument variable regression to tackle endogenous problems. Following previous studies (Cheng et al., 2014), we utilize the industry average and province average value of the pledge ratio as the instrument variable) and perform an instrumental variable (IV) regression. The industry-regional pledge ratio could affect firms' pledge decisions but is unlikely to affect firms' CSR from other channels, which meet the requirement of the instrumental variable.

The results of IV regression are shown in Panel B of Table 4. The p-value of the under-identification test is 0.001, indicating that there are no under-identification problems. The F-value of the weak identification test is 3973 and greater than 19.93 (10% critical value of Stock-Yogo weak ID test), implying that our instrumental variable is not weakly correlated with *Pledge*. In addition, the Hansen J p value for over identification test is 0.544 and larger than 0.1. This result proves our IV regression does not suffer from the over identification problems. In a word, all these tests indicate that our IV regression is effective.

In the first stage results, both *province-year average pledge* and *industry-year average pledge* presents significant coefficients, implying that two IVs correlate significantly with the pledge. Next, *Predicted pledge* has a significantly negative coefficient,

Table 6. Addressing the endogenous concern.

Panel A: Difference in difference analysis

VARIABLES	(1) CSR _{t+1}	(2) CSR _{t+1}
Treat x Post	-1.997* (1.024)	-1.717* (0.941)
Constant	29.064*** (0.586)	-77.286*** (7.196)
Observations	11,081	11,081
Adjusted R-squared	0.194	0.334
Control	No	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	3.805	67.11
Panel B: Parallel trend assumption		
VARIABLES	(1) CSR _{t+1}	(2) CSR _{t+1}
-3	-0.026 (1.518)	0.281 (1.433)
-2	-1.638 (1.637)	-1.137 (1.499)
-1	-1.781 (1.931)	-1.594 (1.807)
0	-1.585 (1.939)	-0.908 (1.800)
+1	-1.829 (1.948)	-1.609 (1.840)
+2	-4.153** (1.891)	-3.649** (1.740)
+3	-4.266** (1.923)	-3.542** (1.766)
Constant	29.979*** (1.305)	-76.573*** (7.331)
Observations	11,081	11,081
Adjusted R-squared	0.194	0.334
Control	No	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	1.720	47.52
Panel C: Instrument variable regression		
VARIABLES	(1) First stage Pledge	(2) Second stage CSR _{t+1}
Pledge (Province)	0.972*** (0.308)	
Pledge (Industry)	0.956*** (0.270)	
Predicted pledge		-54.965** (27.198)
Observations	11,081	11,081
Adjusted R-squared	0.042	0.325
Control	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
Under identification test (P value)	.	0.001
Weak identification test (Cragg-Donald Wald F)	.	156.4
Stock-Yogo weak ID test critical values (10%)	.	19.93
Over identification test (Hansen J P value)	.	0.544

Note: Standard errors are adjusted by clustering at the firm level and reported in parentheses. *, **, *** represent that coefficient is significant at 10%, 5% and 1% level, respectively.

Source: The Authors.

demonstrating that the pledge ratio has a causal relationship with CSR. This result addresses the endogenous concerns and verifies the robustness of our findings.

4.5. Robustness checks

4.5.1. Alternative measure for CSR

Initially, we only include CSR categories of society and environment as the alternative measure for CSR because these two measures are closely related to social welfare. In Panel A of Table 7, the coefficient of *Pledge* is negative and significant and is consistent with the baseline result, proving the robustness of our results.

4.5.2. Alternative measure for share pledging

Next, we replace the pledge ratio of the largest shareholder with the largest shareholder's ratio of share pledging, freezing, and equity custody. In Panel B of Table 7, the coefficient of *Pledge2* is also significantly negative; this finding is consistent with the prior analysis and verifies the robustness.

4.5.3. Fixed effect model

To control the time-invariant factors, we include firm fixed effects in the model and present the result in Panel C of Table 7. *Pledge* also has a negative and significant coefficient, further verifying the robustness.

5. Conclusion

It has become common for firms' shareholders to pledge their shares as collateral for loans worldwide. This policy seeks to help firms (through their controlling shareholders) to acquire external capital while not losing controlling shareholders' rights. To date, research on how share pledging influences the firms' incentives and activities is in its early stages, and whether share pledging will promote or impede CSR performance remains an empirical issue. In this study, we aim to reveal whether and how share pledging influences the firm's CSR performance. Drawing on a variety of theories, we developed two competing hypotheses.

Based on a sample of Chinese listed firms from 2010 to 2017, this paper shows that share pledging damage firms' CSR. To address the endogenous concern, we employ the share pledging reform as the exogenous event to carry out the natural experiment and also utilize the instrumental variable regression. Additional empirical evidence shows that higher risk-taking and agency cost are two possible channels through which share pledging affects firms' CSR. Furthermore, the decrease in CSR caused by share pledging contributes to lower firm performance (proxied by ROA) and firm value (proxied by Tobin's Q).

Our study contributes to the literature in several aspects. First, our study enriches the literature about the economic consequence of share pledging from the perspective of CSR investments. Previous studies only examine the impact on the stock market, firm financial performance, as well as innovation (Li et al., 2019; Wang & Chou, 2018; Ouyang et al., 2019). But how share pledging reshapes firms' decisions,

Table 7. Robustness check.

Panel A: Alternative measure for CSR		
VARIABLES	(1) model1 CSR2 _{t+1}	(2) model2 CSR2 _{t+1}
Pledge	-4.182** (2.050)	-3.115* (1.802)
Constant	7.473*** (0.100)	-29.472*** (2.934)
Observations	11,081	11,081
Adjusted R-squared	0.231	0.293
Control	No	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	4.164	30.32
Panel B: Alternative measure for share pledging		
VARIABLES	(1) model1 CSR _{t+1}	(2) model2 CSR _{t+1}
Pledge2	-14.299*** (5.475)	-9.163** (4.441)
Constant	28.093*** (0.256)	-78.065*** (7.173)
Observations	11,081	11,081
Adjusted R-squared	0.195	0.334
Control	No	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Province FE	Yes	Yes
F	6.820	66.87
Panel C: Fixed effect model		
VARIABLES	(1) CSR _{t+1}	(2) CSR _{t+1}
Pledge	-9.838*** (3.137)	-7.927** (3.288)
Constant	28.077*** (0.011)	-187.066 (154.782)
Observations	11,081	11,081
Adjusted R-squared	0.491	0.508
Control	No	Yes
Year FE	Yes	Yes
Firm FE	Yes	Yes
F	9.837	17.55

Note: Standard errors are adjusted by clustering at the firm level and reported in parentheses. *, **, *** represent that coefficient is significant at 10%, 5% and 1% level, respectively.

Source: The Authors.

especially for the CSR investment remains under-investigated. Second, our study broadens the boundary of CSR determinators. Although existing studies have explored the CSR antecedents from various perspectives, no literature focuses on the share pledging of controlling shareholders. Moreover, our paper uncovers the possible channels through which share pledging affects firms' CSR and verifies that stronger agency cost and more risk-taking are two possible underlying mechanisms.

Finally, our study adds to the literature on how share pledging alters the firm performance and firm values. In our results, controlling shareholders' share pledging impedes firms' CSR investments, thereby leading to poorer firm performance.

Based on our findings, there are several possible implications. First, this paper reveals that the share pledging of the controlling shareholder is detrimental to the firms' CSR performance, and finally leads to poorer firm performance and firm value. Hence, the regulators should implement stronger regulation on the share pledging activities, especially for the controlling shareholders. Second, investors and other stakeholders should be more conservative on firms whose controlling shareholders pledge shares. Share pledging is detrimental to firms' performance and firm value. Accordingly, investors need to avoid investing in firms whose shares are pledged. Third, our results indicate that the negative effect of share pledging on CSR is stronger in firms whose executives are more risk-taking or firms with higher agency costs. Hence, regulators and investors should pay more attention to these kinds of firms.

There are some limitations in our work. First, our studies do not distinguish the pledging incentive of controlling shareholders. Some shareholders employ loans for personal consumption, while some shareholders might reinvest the capital into the firms. Due to the data availability, we cannot identify loan usage, which might affect our estimations. Second, the CSR proxy in our paper might not measure the real CSR investments. Although we employ the Hexun CSR database as the main CSR proxy, which evaluates a firm's CSR performance from five categories, this measure still neglects some categories of CSR, like corporate governance. Thus, this variable might not reflect real CSR investments accurately. Third, our paper only utilizes the China data as the research sample. However, law protection for the minority shareholders is weak in China, and the capital market is not as efficient as developed countries like the U.S. Thus, our conclusions might not be applicable to the developed countries. Finally, the endogenous concern might still exist. Although we have carried out the difference in difference analysis, and instrumental regression to tackle the endogenous problems. But there might still be some omitted unobservable factors, like the personal factors of controlling shareholders, which reshapes the relationship between share pledging and firms' CSR investments.

Future research might be conducted in several areas. At first, future studies could try to identify the loan usage of the controlling shareholders and investigate the impact of different loan usage on the firms' CSR. Next, future research could employ more CSR proxies to verify the impact on CSR. For example, future studies might carry out text mining on the firm's CSR report and try to evaluate firm's real CSR investments. Third, a comparison between emerging countries and developed countries is valuable. Due to the difference in the law environment and capital market, shareholders' motivation to pledge shares might be different. Finally, more underlying mechanisms on how share pledging reshapes firm's CSR decisions could be investigated. Our studies only reveal two possible mechanisms, but there might be other possible channels through which share pledging affect firms' behaviors.

Note

1. <http://stockdata.stock.hexun.com/zrbg/Plate.aspx>

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