Short Selling, Margin Trading, and Corporate Social Responsibility

By: Xiao Liang and Xiaomeng Chen

Abstract

We examine whether firms use CSR activities to signal information about their future prospects to investors and other stakeholders using the pilot program of short selling and margin trading introduced by the China Securities Regulatory Commission in 2010 as a quasi-natural experiment. This pilot program imposes non-fundamentally driven pressure on the stock prices of the pilot firms. We find that the pilot firms enhance their CSR performance to respond to the exogenous shock of the sudden removal of the short-selling and margin-trading bans. When the effect of short selling on CSR is disentangled from the effect of margin trading on CSR performance, we find that the pilot firms respond to the exogenous shock of short-selling pressure by enhancing their CSR performance but not to the exogenous shock of margin trading. The results suggest that CSR activities can send a positive signal about future prospects to investors and other stakeholders including short sellers.

Key words: Shorting selling; Margin trading; Corporate social responsibility

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Introduction

Short sellers and margin traders are the most informative speculators and investors in the capital market. Despite contributing to increasing stock-price informativeness, short sellers are disliked by firms for depressing stock prices by exposing adverse information and undermining the confidence of investors, and margin traders are often blamed for producing excess volatility and destabilizing the market (Karpoff & Lou, 2010; Massa, Zhang, et al., 2015; Seguin, 1990). Firms have incentives to take actions to shield against threats from them. Recent studies have investigated how firms respond to potential risks from short selling and margin trading by reducing earnings management, corporate misconduct, and the precision of management forecasts (Grullon et al., 2015; Li & Zhang, 2015; Massa, Zhang, et al., 2015), and are encouraged by the incentives from margin trading for distortions in financial reporting transparency (Chen et al., 2017). However, extent research mainly has focused on the firms' financial responses of short sellers and margin traders, and less attentions has been paid on the non-financial responses regarding short sellers and/or margin traders. In this paper, we examine whether firms adjust their corporate social responsible (CSR) activities in response to the potential effect of short selling and/or margin trading on their stock prices under a pilot program in China that lifted the ban on short selling and margin trading for stocks on a designated list as a quasi-natural experiment.

The stock market in China has been highly regulated, and short selling and margin trading were completely banned until recently. On March 31, 2010, the China Securities Regulatory Commission (CSRC) launched a pilot program permitting short selling and margin trading in China for stocks on a designated list. After several rounds of list revisions regarding qualification, more than one-third of the total listed stocks in China have been included in the CSRC pilot program; hence, the ban on short selling and margin trading on these stocks has

been lifted. The dual design of the CSRC pilot program in China provides an ideal setting to examine the joint effect of short selling and margin trading on the CSR performance of pilot firms relative to that of the non-pilot firms. Short selling and margin trading are integral parts of market mechanisms. Short selling can reduce overpricing and play a disciplinary role as an external governance mechanism, while margin traders have a speculative nature to exacerbate observed overpricing (Bhojraj et al., 2009). Moreover, the setting of the CSRC pilot program also allows me to distinguish the effect on CSR performance caused by short selling from that caused by margin trading. Thus, the separate effect of short selling and margin trading on CSR performance during the CSRC pilot program can be investigated. Furthermore, the CSRC pilot program represents an exogenous shock to examine whether the pilot firms respond to the threats of short selling and margin trading from non-financial aspects. These pilot firms are selected gradually by the CSRC from 2010 to the present, creating both the time-series and cross-sectional variations in short-selling and margin-trading restrictions for firms. Finally, the CSRC pilot program provides a good opportunity to examine whether market mechanisms, such as short selling and/or margin trading, that encourage socially responsible practices and disciplined managerial practices would affect the CSR performance of the pilot firms relative to that of non-pilot firms in an emerging market.

The issue of CSR is of growing interest and has become prevalent worldwide for the past decades. CSR has been shown to affect firm risk (Lee & Faff, 2009), corporate financial performance (Awaysheh et al., 2020; Brammer & Mollington, 2008; Cochran & Wood, 1984; Flammer, 2015; McGuire et al., 1988; McWilliams & Siegel, 2000), cost of debt (Tan et al., 2019), cost of equity (Dhaliwal et al., 2011; El Ghoul et al., 2011), corporate policy (Hasan et al., 2020; Ni & Zhang, 2019) and capital market reactions (Kim et al., 2014; Wang et al., 2011), etc. Stakeholders are considered to be the main drivers of CSR engagement as customers, employees, and other stakeholders require firms to be socially responsible. Whereas, the recent

studies find that stock liquidity negatively affect firms' CSR performance (Chang et al., 2018) and institutional investors are the driver of firms' CSR practices (Chen et al., 2020; Dyck et al., 2019; H.-D. Kim et al., 2019; I. Kim et al., 2019) because CSR aligns the long-term interest of other stakeholders with that of shareholders and furthermore create value for shareholders in the long run. We argue that managers act strategically to deter the attentions of short sellers and mitigate the effect of short-selling threats by adopting CSR practices for several reasons. First, CSR practices can enhance the corporate image and send a positive signal to the market that firms refrain from opportunistic behaviors, leaving a lower likelihood of uncovering bad news or value-destroying events by short sellers. The positive image established by engaging in CSR can help firms protect themselves against risks of adverse political, regulatory, and social penalties brought by negative corporate events (Godfrey, 2005; Godfrey et al., 2009; Hoi et al., 2013). Next, the potential downward price pressure from short selling gives managers an incentive to take insurance actions to discourage short selling (Hong & Liskovich, 2016; Lins et al., 2017; Servaes & Tamayo, 2013). Lins et al. (2017) documented that firms with high CSR intensity experience higher stock returns than firms with low CSR intensity during the 2008–2009 financial crisis. Their findings support that CSR activities bring an enhanced insurance benefit during a crisis of trust.

On the other hand, margin trading is often viewed as a non-binding constraint in China (Chang et al., 2014; Li et al., 2017). Investors can easily avoid the ban on margin trading by borrowing from various sources and creating leveraged positions. Margin trading has always existed in the market, and the formal introduction of margin trading by the CSRC pilot program will not give managers an incentive to undertake actions to encourage or discourage margin trading. Thus, lifting the ban on margin trading is not expected to affect the CSR performance of the pilot firms.

Using 3,408 firm-year observations covering both the pilot firms and non-pilot firms in the China A-share stock market between 2008 and 2015, we employ a DiD research design to examine the effect of short selling and margin trading on the CSR performance of firms. We find that the removal of short-selling constraints leads to a larger increase in CSR performance for pilot firms compared to non-pilot firms, while margin trading is insignificantly associated with CSR performance. The result indicates the signal and insurance effects of CSR performance. Managers improve CSR performance to build a positive corporate image and maintain the confidence of investors to shield against short-selling threats and prevent downward price pressure. The results are robust when we replace the dependent variable with the industry-adjusted CSR score and use a PSM approach with the DiD test to ensure that the result is not driven by potential endogeneity concerns. We also find the parallel trend assumption holds for the DiD test.

An alternative explanation could be simply that the pilot firms improve their CSR performance because of confronting more both external and internal risks. After controlling for actual short interest positions as a signal of these risks, the inferences continue to hold. Moreover, we explore the cross-sectional variations in the effect of short-selling threats on CSR performance and find that the positive effect of increasing short-selling pressure on CSR performance is more pronounced for firms with additional downward price pressure, bad news disclosures, high bankruptcy risk, and highly concentrated ownerships and for SOEs.

This study contributes to the literature in several ways. First, it provides evidence on the real effects of the secondary financial markets on corporate behaviors in an emerging market. Prior research shows that short-selling threats affect corporate behaviors, such as reducing earnings management and insider trading (Fang et al., 2016; Massa, Qian, et al., 2015; Massa, Zhang, et al., 2015) and improving the quality of financial information to deter short-selling threats (Cheng et al., 2018; Jin et al., 2018). This study focuses on the effect of short

selling and margin trading on non-financial performance and finds that lifting the short-selling ban leads to a larger increase in the CSR performance for pilot firms compared to non-pilot firms. The findings from this study advance the understanding of the relationship between increasing short-selling pressure and the CSR performance of firms. Short sellers play a disciplinary role in emerging markets with a weak institutional environment, prompting firms to engage in CSR practices as insurance actions to mitigate the potential adverse effect on stock prices.

Next, the study contributes to the literature that examines the determinants and strategic roles of CSR. While most studies focus on the value consequences of CSR, this study extends the line of research of the determinants of CSR using a quasi-natural experiment that relaxes short-selling and margin-trading constraints. The results of this study show that well-informed and sophisticated investors can be the driving force behind CSR practices. Unlike other market participants who influence CSR directly, short sellers affect CSR indirectly by promoting managers to take CSR initiatives to shield firms against the market risk of short selling. In addition, this study adds new evidence on the signal and insurance role of CSR. Prior literature shows managers can send signals through various corporate activities, such as dividends, capital structure (Myers, 1984), IPO underpricing, or advertising (Chemmanur & He, 2011). This study shows that managers can use CSR to build relations with stakeholders to stay competitive and create a positive corporate image to deter short-selling threats.

Last, the findings from this study contribute to the policy debate on the benefits and costs of short selling. Previous research suggests that short sellers are good at identifying the overpriced shares of firms with opportunistic behaviors and that short sellers' trading accelerates the discovery of corporate misconduct (Karpoff & Lou, 2010). This study finds that short selling can bring additional benefits to stakeholders by prompting firms to improve CSR performance.

This paper organized as follows. Section 2 describes the institutional background and reviews the prior research on CSR, short selling, and margin trading. Section 3 develops the hypotheses. Section 4 describes the sample selection and research methodology. Section 5 reports the empirical results. Section 6 shows the results of the additional analysis. Finally, Section 7 presents the conclusion.

Institutional Background and Literature Review

Short Selling and Margin Trading Pilot Program in China

Short selling and margin trading of stocks were prohibited in the Chinese stock market until recently. On March 31, 2010, the CSRC introduced the pilot program to lift the ban on short selling and margin trading in the SSE and SZSE. The program aimed to incorporate more information into stocks prices. Initially, 90 constituent stocks in the SSE 50 Index and SZSE Component Index were selected into the program by meeting the requirements of market value, liquidity, volatility, and so on. The CSRC pilot program has gradually revised and expanded the list of pilot firms from 2010 and allows qualified investors to buy eligible stocks on margin and/or to short-sell the stocks of those pilot firms. On September 22, 2014, the stocks in the program list comprised a total of 900 stocks, accounting for one-third of the total listed stocks in China. Appendix 1 shows the timeline of the CSRC pilot program. There were five major qualification list revisions between 2010 and 2014, with several minor revisions between the major revisions. Unlike capital markets in developed countries in which a one-time removal of the short-selling restriction takes effect, the CSRC gradually enlarged the number of "designated" pilot stocks several times.

It is worth noting that the supply of security lending is quite limited in China and short sellers in China face more obstacles in shorting stocks than those in the developed capital markets. From March 2010 to August 2012, qualified investors can borrow money or stock only from security companies. After August 27, 2012, qualified investors can borrow from

other financial institutions, such as banks and insurance companies, under the refinancing policy introduced by the CSRC. The CSRC expects that the refinancing policy expands sources of securities to borrow and further relaxes short sale constraints. These specific regulations in China increase the cost of short selling. Although short selling in China has some limitations, short sellers still can actively participate and build their positions in the market and exert a similar effect as their peers in the developed markets.

Short Selling

Short sellers are the most informed and sophisticated outside investors, who contribute to market efficiency and facilitate the price discovery process (Hope et al., 2017; Karpoff & Lou, 2010). Prior literature suggests that they are more knowledgeable than financial analysts (Christophe et al., 2010; Drake et al., 2011) and can front-run insider trading (Khan & Lu, 2013). Although short selling contributes to market efficiency (Diamond & Verrecchia, 1987; Engelberg et al., 2012; Miller, 1977), short selling also places downward pressure on the stock price (Massa, Zhang, et al., 2015). Recent studies show that after the removal of short-selling restrictions on pilot firms in the U.S., short-selling pressure on these firms' stock prices increases significantly, damaging the confidence of investors and other stakeholders and affecting other market participants' decisions (Grullon et al., 2015). For example, Khanna and Mathews (2012) argue that the initial stock-price decline due to short-selling affects the decisions made by existing creditors or other counterparties of the firms, which not only amplifies the price drop but also makes it more permanent. Meng et al. (2020) find that short sales can reduce a firm's ability of raising cheap and overvalued external capital and therfore, worsen a firm's financial constraints.

Given that short selling can bring both the benefits and substantial costs to the affected firms, the removal of short selling ban can affect corporate decision makings. De Angelis et al. (2017) find that the exogenous removal of short-selling constraints causes firms to change the

design of executive incentive contracts by granting more stock options to discipline managerial behaviors. Managers are sensitive to short-sellers and the threats that they have on stock prices (Fang et al., 2016; Grullon et al., 2015). They have incentives to undertake actions to discourage short sellers and to shield their firms and their jobs from the potential downward pressure on stock prices. Khanna and Mathews (2012) also find that blockholders buy a disproportionately large amount to prevent value destruction due to short selling threats.

Besides, short sellers play the role of an external monitor to discipline managers. Karpoff and Lou (2010) find that the short sellers are proficient at identifying financial misrepresentation before it becomes public. Recent studies have investigated the short selling pilot program (Reg SHO) in the U.S. that generates exogenous increases in short-selling pressure and disciplines manager behaviors. Managers respond to the external shock by decreasing earnings management (Fang et al., 2016; Massa, Zhang, et al., 2015), cutting overinvestment (Chang et al., 2015), reducing equity issues and investment (Grullon et al., 2015), and decreasing the precision of bad news forecasts (Li & Zhang, 2015). Using the CSRC pilot program in China as a quasi-experiment, several studies support that short selling has a disciplinary effect. The deregulation of short selling increases conditional accounting conservatism (Jin et al., 2018), reduces insider trading (Wang et al., 2018), improves price efficiency, reduces stock volatility and have an (Chang et al., 2014; Li et al., 2017). Existing literature focuses on short-selling in the developed markets and its implication on financial performance, while the effect of short selling on non-financial performance in emerging markets remains unexplored.

Margin Trading

Margin trading allows investors to build up a leveraged long position by borrowing capital (or stocks) from registered security companies or other sources. Prior research suggests that margin-traders are potentially informative speculators who trade to destabilize the market

and produce excess volatility (Chang et al., 2014). However, the empirical evidence is mixed. Hardouvelis and Peristiani (1992) find that the margin requirements are negatively related to the changes in stock prices and market instability in Japan. Hirose et al. (2009) show that individual investors dominate margin trading in Japan and their trades can positively predict future returns for small firms. Seguin (1990) examines the inception of margin trading for U.S. over-the-counter stocks and finds that margin trading increases stock price informativeness and reduces volatility and noise, leading to an increase in the market value. Hsieh and Miller (1990) find that the changes in margin requirements by the Federal Reserve have tended to follow rather than lead changes in market volatility. Limited literature examines the implication of margin trading in China and the findings are inconsistent. Chang et al. (2014) find improved price efficiency and lower return volatility for the pilot firms after the ban on margin trading is lifted by the CSRC pilot program. Chen et al. (2017) find that the discretionary accruals of pilot firms increase relative to the non-pilot firms, as the removal of the ban on margin trading provides managers with incentives for earnings management.

Corporate Social Responsibility

CSR is regarded as involving "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (McWilliams & Siegel, 2001, p. p. 117). Prior studies suggest that CSR practices provide a form of insurance and help firms establish a positive corporate image of caring for society and refraining from corporate greed (Godfrey et al., 2009; McWilliams et al., 2006). The socially responsible image of a firm can constrain opportunistic behaviors, such as earnings management, tax avoidance, and insider trading (Gao et al., 2014; Hoi et al., 2013; Kim et al., 2012) because reputation can be an informal enforcement mechanism against opportunism as documented in the literature (Gao et al., 2014; Klein & Leffler, 1981). For example, Kim et al. (2012) find that socially responsible firms are less likely to manage earnings. Hoi et al. (2013) provide evidence that socially

responsible firms have a lower likelihood of engaging in tax-sheltering activities. Gao et al. (2014) find that executives of firms with high CSR are less likely to engage in insider trading than executives of firms with low CSR.

This socially responsible image benefits firms by creating reputational capital and extending organizational networks (Fombrun & Shanley, 1990), facilitating talent attraction and retention (Greening & Turban, 2000), increasing the price premium of products (Eichholtz et al., 2010), improving consumer evaluations (Brown & Dacin, 1997), and reducing the threat of regulation (Maxwell et al., 2000). The belief that CSR practices can help promote the public image of a firm is widespread among corporate managers. Adam Friedman Associates (2012) survey CSR executives at Fortune 1000 firms and identify reputation building as the primary motivation behind CSR initiatives. Similarly, Parsa et al. (2016) interview executives and senior managers of the top 11 largest companies in China in 2016 and reports that all participating managers state that CSR is essential for their corporate image and reputation.

Moreover, recent studies suggest that the positive image created by engaging in CSR can help firms protect themselves against the risk of adverse political, regulatory, and social penalties in case of negative corporate events (Godfrey, 2005; Godfrey et al., 2009; Hoi et al., 2013; Lins et al., 2017). Godfrey (2005) theorizes that a positive CSR reputation is particularly important when negative corporate events occur because it provides some degree of insurance protection by increasing the likelihood of positive attributions from society's arbiters. Flammer (2012) argue that CSR is a resource with insurance-like features and finds that firms with stronger environmental CSR performance experience a smaller stock-price decrease following the announcement of eco-harmful behaviors. Hong and Liskovich (2016) investigate the influence of firms' CSR on penalties issued by the U.S. Department of Justice and the Securities and Exchange Commission (SEC) for violation of the Foreign Corrupt Practices Act and find that socially responsible firms receive more lenient settlements from prosecutors.

Finally, Lins et al. (2017) document that firms with high CSR intensity had higher stock returns than firms with low CSR intensity during the 2008–2009 financial crisis. Their findings support that CSR activities create an enhanced insurance benefit during a crisis of trust.

While the above discussions focus on the image of firms caused by CSR, several studies view CSR as reflecting the managerial personal preferences for good citizenship or ethics, which indicates less managerial opportunistic behaviors (Kim et al., 2012; Lanis & Richardson, 2012). Also, CSR activities are used by managers to signal their own (insider) information about future performance to outsider stakeholders (Lys et al., 2015). Conversely, managers could engage in CSR activities at the expense of shareholders for self-interests (Moser & Martin, 2012). That is investment in CSR practices could be a signal of agency problems in firms. Moser and Martin (2012) suggest that field managers might invest in CSR projects because this boosts their reputation in the community or among special interest groups whose admiration they value. Moreover, when a firm builds an image of being socially responsible, its executives, especially those who are vocal about social responsibility, are likely to receive the credit (Hemingway & Maclagan, 2004). If managers obtain other private benefits from CSR practices, they will overinvest (Cheng et al., 2016; Masulis & Reza, 2015).

Hypothesis Development

Effect of Short Selling on CSR Performance

The removal of the short-selling ban inspired strong public reactions, indicating that the deregulation is important to investors, managers, and other stakeholders. Short sellers are the most informed and sophisticated investors in the capital market. Short selling facilitates the flow of unfavorable information into stock prices, increases stock price efficiency, and dampens price inflation (Fang et al., 2016; Karpoff & Lou, 2010; Miller, 1977). It could make uninformed investors and important stakeholders misinterpret such negative price pressure as worsening fundamentals, which exposes pilot firms to a high likelihood of bear raid risk. Prior

research demonstrates that the stock price is related to manager compensation, job security, and personal gain through stock sales (Beneish & Vargus, 2002; Burns & Kedia, 2006; DeFond & Park, 1997), which implies that the benefit to managers decreases with the prospect of short selling.

I argue that managers act strategically to deter short sellers' attention and mitigate the effect of short selling threats by adopting CSR performance for several reasons. First, CSR practices can enhance the corporate image and send a positive signal to the market that firms refrain from opportunistic behaviors, leaving the lower likelihood of uncovering bad news or value-destroy events by short sellers (Hong & Liskovich, 2016; Lins et al., 2017; Servaes & Tamayo, 2013). Next, the potential downward price pressure from short sellers gives managers incentives to take insurance actions to prevent them from becoming the target of short sellers. Moreover, CSR practices provide a form of insurance, shielding firms against the risk of market, political, regulatory, and social sanctions when negative events occur (Godfrey, 2005; Minor & Morgan, 2011; Servaes & Tamayo, 2013). According to Koh et al. (2014), if a firm is at high risk of experiencing negative events, it has a greater need for insurance protection and is more likely to benefit from CSR practices to the extent that CSR functions as an insurance mechanism. Fombrun et al. (2000) also suggest that CSR can develop goodwill and trust with investors and stakeholders that insures firms by mitigating negative reactions of shareholders to the announcement of negative events. The pilot program lifts the ban of short selling constraints, significantly increasing short selling pressures on pilot firms. To alleviate the increased short selling pressures, managers of the pilot firms have the incentives to improve firms' CSR performance.

On the other hand, it is possible that managers could cut CSR expenditures when facing increased short selling pressures. In addition, CSR is a long-term investment with uncertain returns to firm value (Fieseler, 2011). In the short term, CSR cannot generate returns for firms

but can increase corporate expenditure. The short selling threat may lead managers to cut CSR investment to improve the short-term financial performance and stock price. Moreover, firms may engage in CSR due to managerial self-interests (Masulis & Reza, 2015; Moser & Martin, 2012). Short sellers have been considered an external governance mechanism to discipline management by curbing earnings management, corporate misconducts, and insider trading (Fang et al., 2016; Karpoff & Lou, 2010). Managers may cut CSR investment motivated by self-interest when facing the threats of shorting shares in their firms. We propose and test the following hypothesis in an alternative form:

Hypothesis 1: The removal of the short selling ban is associated with the change in CSR performance of the pilot firms.

Effect of Margin Trading on CSR Performance

In China, margin trading is often viewed as a non-binding constraint (Chang et al., 2014; Li et al., 2017). Investors can easily avoid the ban on margin trading by borrowing from various sources and creating leveraged positions. Margin trading has always existed in the market, and the formal introduction of margin trading by the CSRC pilot program will not give managers incentives to undertake actions to attract or discourage margin traders. Thus, lifting the ban on margin trading is not expected to affect the CSR performance of the pilot firms. We form the following hypothesis in the null form:

Hypothesis 2: The removal of the margin trading ban is not associated with a change in the CSR performance of the pilot firms.

Research Design

Sample

The information of the pilot list collected from the SSE and SZSE websites. Data on short selling and margin trading are obtained from the CSMAR database. The CSR score data are from RKS, which is a third independent CSR rating agency. It covers the firms that issue

CSR reports in China. The RKS provides yearly CSR ratings based on the last year information of the firm, with scores available from 2009.[*] Thus, the starting year of the sample is 2008. Firm-level financial information is also from the CSMAR database. Panel A in Table 1 illustrates the sample selection procedures. The initial sample consists of all A-share listed firms on the SSE and SZSE from 2008 to 2015. Because the exchanges expand or revise the list of stocks included in the CSRC pilot program throughout the year, we exclude the pilot firm observations in the first year when they were included in the pilot program to eliminate the announcement effect. We also exclude observations of 2010 for the pilot firms, as 2010 is the starting year of the CSRC pilot program. In addition, we exclude firms in the financial industry and firm-years without CSR scores or sufficient data to calculate control variables. The sample size is substantially reduced due to the unavailability of CSR scores. The final sample includes 2,275 pilot firms-year observations and 1,133 non-pilot firm-year observations. Panel B in Table 1 illustrates the yearly distribution of the fiscal sample. The number of firms with CSR scores increases over time. Panel C in Table 1 shows the distribution of the pilot firm observations before and during the CSRC pilot program. The number of observations peaks closer to the year when the pilot program starts and decreases in the year before and during the inclusion of the firms in the pilot list.

<Insert Table 1 about here>

Models and Variables

Following Li and Zhang (2015) and Hope et al. (2017), we first examine the effects of short selling and margin trading on CSR performance by estimating the following DiD regression:

$$CSRscore_{it}=\beta_0+\beta_1 PILOT_i \times DURING_t+\beta_2 PILOT_i+\beta_k Controls_{it}+Industry\ FE+Year\ FE+\varepsilon_{it} \quad (1)$$

[*] In other words, the scores disclosed in 2009 represent the CSR performance of firms in 2008.

where the subscript *i* refers to firm *i*, and the subscript *t* refers to year *t*. The dependent variable, *CSRscore*, is CSR performance rating score provided by the RKS. Following Dhaliwal et al. (2011), we also replace *CSRscore* with *CSR_ADJ*, the adjusted CSR scores by industry and year median to make them comparable across industries as a robustness check. *PILOT* is a dummy variable that is equal to 1 for firms on the designated list in the CSRC pilot program and is 0 otherwise. *DURING* is a dummy variable equal to 1 if the fiscal year end falls after the date when the firm is included in the pilot program.[†] The variable of interest is the DiD estimator, β_1. A positive/negative and significant β_1 supports the hypotheses that the removal of the short selling and marginal trading ban by the CSRC pilot program causes a greater change in CSR performance for the pilot firms than for the control firms. We include industry and year fixed effects in Eq. (1) to control all time-invariant firm-level omitted variables, and cluster the robust standard errors at the firm level in all empirical analyses conducted in this study.

Following prior literature on CSR performance (Dhaliwal et al., 2011; Lu et al., 2016), we control for other firm-level characteristics factors including firm size (*SIZE*), leverage (*LEV*), property, plant and equipment (*PPE*), firm age (*AGE*), return on assets (*ROA*), sales growth (*GROWTH*), market-to-book ratio (*TOBINQ*), share liquidity over the fiscal year (*LIQUIDITY*), capital expenses (*CAPEX*), analyst following (*ANALYST*), big 4 auditors (*BIG4*), and whether the CEO is also in the chairman position (*DUAL*) that might be associated with CSR performance. All continuous variables are winsorized at 1st and 99th levels to mitigate the effect of outliers. The definitions of all variables are provided in Appendix 2.

The main concern with the DiD design is the risk of confounding effects that would cause the treatment group to change its behavior absent a change in short selling and margin

[†] In the robust test, we also set *DURING* equals to1 for observations in control firms from 2010 to 2015 and equal to 0 otherwise.

trading restrictions. The concern is exacerbated when the treatment occurs at only one point in time (e.g., Reg SHO pilot program in the U.S.) compared with staggered changes. The CSRC pilot program in China contains multiple exogenous changes during the sample period, which can help mitigate the risk of confounding effects (Li et al. 2017; Wang et al. 2018).

Next, following Chen et al. (2017), we apply the pool regression with fixed effects to test the separate effects of margin trading and short selling on CSR performance. The models are specified as follows:

$$CSRscore=\alpha_0+\alpha_1 MARGIN_{it}+\alpha_2 SHORT_{it}+\alpha_k Controls_{it}+Industry\ FE+Year\ FE+Firm\ FE+\epsilon_{it} \quad (2)$$

where *MARGIN* is the remaining balance of margin trading and *SHORT* is the remaining balance of short selling. *MARGIN (SHORT)* implies the potential borrowing (lending) amount of the underlying stock at the fiscal year-end. *Controls* are the same set of control variables specified in Eq. (1).

Furthermore, we attempt to address the potential endogeneity concern by adopting a change specification of Eq. (2) to infer the direction of causality for the relation between short selling, margin trading, and CSR performance respectively. The first change model is shown as follows:

$$\Delta CSRscore=\gamma_0+\gamma_1 \Delta MARGIN_{it}+\gamma_2 \Delta SHORT_{it}+\gamma_k Controls+Industry\ FE+Firm\ FE+Year\ FE+\sigma_{it} \quad (3)$$

where Δ*CSRscore* is the difference in *CSRscore* between the current and prior fiscal years, Δ*SHORT* is the net sells of securities lending and Δ*MARGIN* is the net purchase of margin trading. In addition, Δ*MARGIN* and Δ*SHORT* imply the realized change in the borrowing (lending) amount of the underlying stock within the year. Eq. (3) allows me to use each firm as its own control and is less susceptible to the endogeneity problem than the level model (Berger et al., 1997).

Results

Summary Statistics

Table 2 summarizes the variables used in the main test. Panel A provides statistics for all variables used in the empirical tests, and these are generally consistent with those reported in prior research (Chen et al. 2018; McGuinness et al. 2017). CSR performance ranges from 13.330 to 87.950, with an average of 37.567 and a standard deviation of 12.271, indicating a considerable variation in CSR performance. Panel B compares the differences in the means between pilot firms with non-pilot firms in the sample. The pilot firms have a significantly higher CSR performance than non-pilot firms. Panel C shows the Pearson correlation matrix and Spearman rank correlation. The upper-triangular cells are Spearman rank correlation. The lower-triangular cells are Pearson correlation matrix. The correlation between *DURING* and *CSRscore* is significantly positive, indicating the initial support of the motivation for the valuation creation of CSR. Moreover, the correlation coefficients between the control variables are low, and the multicollinearity is not significant and is unlikely to affect the final results.

<Insert Table 2 about here>

Main Results

Univariate difference-in-differences test. As a preliminary analysis, Table 3 reports the results of the univariate DiD tests examining the effects of the CSRC pilot program on CSR performance. We capture the change in CSR performance from the pre-program period to the during-program period separately for both pilot and non-pilot firms. We then take a second difference between the two groups to obtain the DiD estimates.

Panel A in Table 3 reports the cross-sectional comparison for the sample. As for pilot firms, we define the period before the pilot firms are added into the pilot list as *PRE*, and the period after entering the pilot list as *DURING*. As for non-pilot firms, we define the two years before the pilot program (2008 and 2009) as *PRE*, and the years after the pilot program (2011

to 2015) as *DURING*. The mean CSR performance for the period before the pilot program is 34.252 for pilot firms and 28.341 for non-pilot firms. The *t*-statistic for the difference (the cross-sectional estimator 5.911) in means is -7.202, and the Wilcoxon *z*-statistic for the difference in medians is -7.885, both significant at the 1% level. The result indicates that CSR performance for pilot firms is better than non-pilot firms before the implementation of the pilot program. During the period of the pilot program, the mean CSR performance increase to 43.997 for pilot firms and to 35.876 for non-pilot firms. The mean difference is 8.121 (*t*-statistic = 15.760) and the median difference is 6.981 (Wilcoxon *z*-statistic = -14.854), both significant at the 1% level.

<Insert Table 3 about here>

The first two columns in Panel B of Table 3 show the time-series estimators, which track the change in CSR performance within each group of firms across the years before the pilot program and the years during the pilot program. The second column shows that the average CSR performance for pilot firms drops by 9.745 (significant at 1% level) from before the pilot period to during the pilot period. The CSR performance for non-pilot firms also increases significantly by 7.535 (significant at the 1% level). The potential time trend in the Chinese experiment would be well controlled in the DiD analysis. The last column of Panel B in Table 3 reports on the univariate DiD estimators. The mean DiD estimator for CSR performance from before to during the pilot program is 2.210 with a t-statistic of 2.234. The difference is statistically significant at the 5% level. The univariate DiD results indicate that compared with control firms, pilot firms experience a significant increase in CSR performance due to the exogenous shocks of the deregulation of short selling and margin trading. Overall, these findings provide the initial evidence that the removal of short selling and margin trading can affect CSR performance.

Multivariate difference-in-differences tests. Table 4 reports the estimation results of Eq (1) using observations from both pilot firms and non-pilot firms for the window period between 2008 and 2015. Column (1) and Column (4) of Table 4 show the results without controlling any firm characteristics. Columns (2)–(3) and Columns (5)–(6) of Table 4 report the results with control variables. The coefficient on *PILOT*×*DURING*, β_1, is positive and significant at the 1% level (using two-sided tests) for all six regressions, suggesting that the pilot firms experience an improvement in CSR performance relative to non-pilot firms after the removal of the short selling and margin trading bans. The magnitude of β_1 is consistent with the univariate DiD results reported in Table 3. In terms of economic significance, Column (2) shows that the removal of short selling and margin trading constraints economically improve CSR performance by 3.07% under short selling pressure.‡

<Insert Table 4 about here>

The coefficients on *PILOT* in Column (2) Column (5) of Table 4 capture the time-invariant difference between the pilot firms and non-pilot firms, which is insignificant, indicating no significant time-invariant difference between pilot firms and non-pilot firms. Most control variables that are statistically significant have the same signs as in prior studies. Firm size, return on assets, property, plant and equipment investment, analyst following and big 4 auditors are positively related to CSR performance, while sales growth and firm age are negatively associated with CSR performance.

To mitigate the concerns of potentially omitting related variables, we perform an alternative DiD estimation including firm, year and industry fixed effects and excluding *PILOT* because there is no inter-firm variation of pilot firms. The result in Column (3) and Column (6) in Table 4 shows that β_1 remains significantly positive. Furthermore, Panel B shows the results

‡ Note that 3.07% = 1.201/39.101, where 1.201 is the coefficient β_1 on the interaction iterm *PILOT*×*DURING* in Panel A of Table 4, and 39.101 is the mean *CSRscore* for the pilot firms in Panel A of Table 2.

using the industrial adjusted CSR score to measure CSR performance. The inference is still unchanged, suggesting that the results are not driven by industrial characteristics or other omitted firm-level correlated variables. Overall, the results in Table 4 suggest that the removal of short selling and margin trading restrictions by the CSRC pilot program positively affects CSR performance for the pilot firms.

The Separate Impact of Short Selling and Margin Trading on CSR Performance

In this section, we investigate the separate effects of short selling and margin trading on firms' CSR performance. Given that short selling and margin trading are allowed simultaneously for stocks in the CSRC pilot program, the main results are jointly affected by both market mechanisms. We employ Eq. (2) and Eq. (3) to disentangle the effect of short selling from that of margin trading on CSR performance.

Table 5 represents the results of the effects of short selling and margin trading on CSR performance, respectively. Columns (1)–(3) report the results of Eq. (2). Columns (4)–(6) show the results of Eq. (3). The coefficients of *SHORT* and Δ*SHORT* are significantly positive in Columns (1), (3), (4), and (6), while the coefficients of *MARGIN* and Δ*MARGIN* are insignificant in Columns (2), (3), (5), and (6). The coefficients on short selling are not only statistically but also economically significant. These results indicate that short selling pressure positively affects the CSR performance of firms. Margin trading, however, does not affect the CSR performance, which supports Hypothesis 2. In China, margin trading is viewed as a non-binding constraint (Chang et al., 2014; Li et al., 2017). Investors can borrow from other resources for trading when margin trading is constrained. Thus, the formal introduction of margin trading in China does not result in any significant change in CSR performance as expected. On the other hand, the external disciplinary role played by potential short sellers has a positive effect on incentives for managers to pursue CSR activities.

<Insert Table 5 about here>

To summarize, the results in Table 5 imply that, the pilot firms improve CSR performance to enhance the positive firm image and create firm value against short selling threats. Because the effects of short selling on CSR performance are significantly positive, but margin trading does not affect CSR performance, the overall effects of lifting the short selling and margin trading bans by the CSRC pilot program in Table 4 is primarily driven by short selling.

Robust Checks

Parallel trend test. I perform several robustness checks. First, we perform a test to examine the validity of the parallel trend assumption underlying the DiD estimation. Following Y.-C. Chen et al. (2018), we track the effects of the pilot program on CSR performance before and after it took effects. We re-examine Eq. (1) by adding 10 indicator variables: *BEFORE5*, *BEFORE4*, *BEFORE3*, *BEFORE2* and *BEFORE1* for the period before being added to the pilot list, and *AFTER1*, *AFTER2*, *AFTER3*, *AFTER4*, and *AFTER5*, for the period after being added into the pilot list. The variables *BEFORE1*, *BEFORE2*, *BEFORE3*, *BEFORE4* and *BEFORE5* represent one year, two years, three years, four years, and five years before the firm is added to the pilot list. In addition, *AFTER1*, *AFTER2*, *AFTER3*, *AFTER4*, and *AFTER5* are dummy variables that represent one year, two years, three years, four years, and five years after the firm is added to the pilot list. Then we also replace the *PILOT*×*DURING* dummy with 10 interaction items, *PILOT*×*BEFORE5*, *PILOT*×*BEFORE4*, *PILOT*×*BEFORE3*, *PILOT*×*BEFORE2*, *PILOT*×*BEFORE1*, *PILOT*×*AFTER1*, *PILOT*×*AFTER2*, *PILOT*×*AFTER3*, *PILOT*×*AFTER4*, and *PILOT*×*AFTER5*. [§]

Panel A in Table 6 shows that coefficients on the interactions *PILOT*×*BEFORE5*, *PILOT*×*BEFORE4*, *PILOT*×*BEFORE3*, *PILOT*×*BEFORE2* and *PILOT*×*BEFORE1* are

[§] As the panel period ranges from six years before being a pilot firm to five years after becoming a pilot firm, we also include the interaction *PILOT*×*BEFORE6*, which is omitted automatically in regression.

insignificant, while the coefficients on *PILOT×AFTER1*, *PILOT×AFTER2*, *PILOT×AFTER3*, *PILOT×AFTER4* and *PILOT×AFTER5* are significantly positive. The results are satisfied with the parallel trend assumption of the DiD model and the effects of the pilot program on CSR performance occur after becoming a pilot firm.

<Insert Table 6 about here>

Constructing control firms using propensity score matching. Second, we use a PSM method to construct a balanced sample. The PSM method can mitigate the inherent endogeneity issue, as the pilot firms are among the main exchange index, and are usually the firms with larger size, higher liquidity, lower volatility, and better CSR performance compared to non-pilot firms. Following Li et al. (2017), we first conduct a logistic regression analysis using the sample before the introduction of short selling and margin trading (the year before 2010) with the dependent variable *PILOT*, which is equal to 1 if a firm belongs to a treatment group and is 0 otherwise. The independent variables include several predictors, including firm size (*SIZE*), return on assets (*ROA*), percentage of shares owned by the government (*GOV*), shares turnover (*TURNOVER*), book-to-market ratio (*BM*) and stock exchange (*STOCKMARKET*). These predictors are predominantly used by CSRC to evaluate the eligibility of a stock to participate in the short selling and margin trading pilot program. In addition, we include industry fixed effects and year fixed effects. Panel A of Appendix 3 shows the result of the logistic model. Then, we predict the probabilities of participating in the program or the propensity score for all firms and match each treatment firm to a benchmark firm using the nearest neighbor matching technique with replacement and setting the caliper to 0.25×the standard error of the propensity score (Dehejia & Wahba, 2002). Panel B of Appendix 3 reports the effectiveness of the matching procedure. These results suggest that the PSM procedure reduces differences between the treatment and control firms before the pilot program.

Panel B of Table 6 reports the results using the PSM sample. The coefficient on *PILOT×DURING* is significantly positive at the 10% level in both Columns (1) and (2). These results are consistent with the results using the full sample, suggesting that, relative to non-pilot firms, pilot firms enhance their CSR performance after the removal of short selling and margin trading constraints.

Placebo and falsification tests. To control for potential confounding effects or omitted variables, we perform a placebo test. A placebo test uses a different sample that does not have access to treatment. In our setting, the treatment in question is the lift of restrictions on short-selling and margin trading for stocks on the designated list and the treatment effect is a improvement in CSR performance. If we observe the same treatment effect in the placebo group as in the treated stocks, we would infer that the treatment is unlikely to have caused the observed treatment effect.

I perform three sets of placebo tests to ensure the validity of the analysis that the effect occurs right after the firms being added into the pilot list. For the firms in the treatment group, First, we include the firm-year observations for the year when firms are added to the pilot list. We set the year when firms enter the pilot program as before the pilot program period and during the pilot program period because several major revisions of the pilot list of the firms took place midway through the year, as shown in Appendix 1. Columns (1)–(4) of Panel C in Table 6 show the regression results when setting that year as before the period or during the period. The coefficient on *PILOT×DURING* remains significantly positive.

In the second test, following prior studies (Chen et al., 2017; Jin et al., 2018; Li et al., 2017), we assign 2010 as the deregulation year of the non-pilot firms, classifying the firm-year observations of the non-pilot firms as during the pilot program period from 2010 to 2015. Column (5) of Panel C in Table 6 shows that the result remains unchanged.

Moreover, we evaluate the extent to which the pilot program in China is exogenous using the post reversal test. The removal of the short selling and margin trading bans in China changes the list of firms eligible for short selling and margin trading over time, which help to mitigate the issue from other omitted effects over the time trend. Some of the pilot firms were removed from the pilot list and reinserted in the list afterwards. We create a dummy variable (*POST*) to indicate the period for the pilot firms subsequent to exclusion from the pilot list. The post-period sample is composed of 40 observations. We report the results in Table 7. In Columns (1) and (2), we exclude the observations that have removal experiences. Then, we include the post-period in Columns (3) and (4). In Columns (5) and (6), we exclude the years during the pilot program and directly compare the difference in CSR performance between the period prior to the pilot program and the period following the end of the program. The results clearly show that the removal of short-selling constraints improves the CSR performance of firms and, more importantly, that this effect disappears after pilot firms are removed from the pilot list.

<Insert Table 7 about here>

This test ensures that the findings primarily represent the signal effect of CSR for the concerns regarding of short selling threats. The removal of short selling and margin trading bans in China per se changes the list of firms eligible for short-selling over the time trend.

Additional Analysis

Short Interest as A Signal of Risk

Prior literature indicates that short sellers are a source of information about firm risk and are able to predict a variety of negative corporate events (Cassell et al., 2011). Around the announcement of the pilot program, short interest increases, which is a measure of the long-term short-selling positions (Grullon et al., 2015). If the private information about the stock is likely to be negative, abnormally high levels of short interest predict significantly higher

profitability for short sellers and indicate higher risk for the pilot firms (Purnanandam & Seyhun, 2018). The disclosure of short interest provides investors with information about the financial health, viability, and future securities prices of firms. We examine whether the short sellers are a source of risk per se and whether they will affect CSR practices. We report the result in Table 8, including *SHORTINTEREST* in Eq. (1). Moreover, *SHORTINTEREST* is measured by the ratio of shares in a short position to the total shares outstanding in the fiscal year multiplied by 1,000. The coefficient on *SHORTINTEREST* is insignificant in the table. More importantly, the coefficient estimate for the test variable remains significantly positive after controlling for *SHORTINTEREST*. Therefore, we conclude that the result is not driven by short interest.

<Insert Table 8 about here>

Effect of Downward Price Pressure on CSR Performance

Short selling may exert downward pressure on prices, further destabilizing the fundamental value of a firm. As informed investors in the market, short sellers have a strong incentives to exploit bad news about firms as a mean to reap profits, especially given the speculative nature of the Chinese stock market (Mei et al., 2009). Chang et al. (2014) find that stocks experience negative returns when they are added to the pilot list of the short selling and margin trading program.

The downward price pressure of short selling may increase the negative effect of failing to meet market expectations. Therefore, any additional downward price pressure arising from short selling may incentivize managers to send a positive signal through CSR activities. When the firm becomes a real target firm for short selling, they could have more incentive to prevent short selling activities (Jin et al., 2018). We expect that managers improve CSR performance when their firms become a real target of short sellers in response to increased downward stock price pressure.

To measure downward price pressure (*SHORTPRESS*), we calculate the abnormal short sales following Jin et al. (2018), which are the short sales of a firm at a certain fiscal year minus the median level of annual short sales of all eligible firms, multiplied by 1,000. We re-examine Eq. (1) by adding *SHORTPRESS*×*PILOT*×*DURING* and *SHORTPRESS*×*PILOT*. The results are reported in Table 9. In Column (1), the coefficient on *SHORTPRESS*×*PILOT*×*DURING* is positive and significant at the 5% level. When we replace the dependent variable with the industry adjusted CSR score, *CSRscore_ADJ*, the coefficient on *SHORTPRESS*×*PILOT*×*DURING* is positive and significant at the 1% level. The results support the view that managers improve the CSR performance of firms in response to the increasing downward price pressure when their firms become a target of short sellers.

<Insert Table 9 about here>

Effect of Earnings News

The pilot program of short selling represents an exogenous reduction in short-selling constraints, leading to an increase in short selling activities for the pilot firms (Diether et al., 2009). The increased trading activities of pessimistic investors make the prices of the pilot stocks more sensitive to negative news (Grullon et al., 2015). Prior literature finds that the sensitivity of market prices to forecast news has an effect on the strategic disclosure choices of managers who aim to reduce the prediction of bad news to maintain the current stock-price level (Li & Zhang, 2015). We predict that the effect of the removal of the short selling constraints on CSR performance is more pronounced for pilot firms with bad earnings news because short sellers can detect and release bad news to induce a downward stock price.

I examine the effect of short selling on CSR performance separately for firms with negative earnings news and positive earnings news. Following Li and Zhang (2015), we classify an annual report as containing bad (or good) news if the firm's annual *ROA* is lower (or higher) than the industry median *ROA***.** Table 10 presents the results. Consistent with the

prediction, Column (1) shows that the coefficient on *PILOT*×*DURING* is insignificant for the sample of firms with good earnings news, while Column (2) shows that the coefficient of *PILOT*×*DURING* is positive and significant for the sample of firms with bad earnings news. The magnitude of the coefficient indicates that pilot firms with lower earnings increase their CSR performance by 5.458% around the implementation of the margin trading and short selling pilot program.** The magnitude is also economically significant. We also compare the difference of coefficient on *PILOT*×*DURING* between the two groups by applying a Chow test and the result shows that the effect of the removal of the short selling ban on CSR performance is larger for pilot firms with bad news disclosures than for firms with good news disclosures (*Chi2* = 4.900 and *P-value* = 0.027).

<Insert Table 10 about here>

Effect of Bankruptcy Risk

Although short selling constraints have been removed, the searching costs to discover target stocks and loan fees are still high. Short sellers tend to target certain firms to lower shorting costs for profit maximization. Prior research has documented that short sellers are more likely to target firms experiencing high bankruptcy risk, as these firms have financial distress and face high litigation risk (S. Chen et al., 2018; Hope et al., 2017). Therefore, short selling threats following the removal of the constraints are greater for firms with high bankruptcy risk than other firms. These firms with high bankruptcy risk will be more likely to improve their CSR performance to shield against the potential short selling threats. Overall, we predict that the effect of short selling on CSR performance is more salient for firms with high bankruptcy risk.

** Note that 5.458 % = 2.134/39.101. where 2.134 is the coefficient on *PILOT*×*DURING* in Column (2) of Table 10, and 39.101 is the mean *CSRscore* for the pilot firms in Panel A of Table 2.

I examine whether the effect of short selling threats on CSR performance only exists in the high bankruptcy risk subsample. Following Guan et al. (2016), we use $Z_{China}Score$, the Altman *Z-Score* for Chinese firms, which was defined by Zhang et al. (2010), to measure bankruptcy risk. A lower $Z_{China}Score$ indicates firms with more severe financial distress. Specifically, we classify firm-year observations with $Z_{China}Score$ that are lower than 0.9 as the high bankruptcy risk subsample and the other observations as the low bankruptcy risk subsample.[††]

Table 11 presents the results. Columns (1) and (2) show the results for high bankruptcy risk subsample and low bankruptcy risk subsample, respectively. The coefficient on *PILOT*×*DURING* is positive and significant at the 5% level for the high bankruptcy subsample, but positive and insignificant for the low bankruptcy subsample. The result of Chow test is significant (*Chi2* =3.555 and *P-value* = 0.0670), indicating that compared with firms with low bankruptcy risk, firms with high bankruptcy risk improve their CSR performance more to protect themselves from short selling threats.

<Insert Table 11 about here>

Effect of Firm Ownership: SOE vs. Non-SOE

A unique feature of Chinese listed firms is that they are generally classified into SOEs and non-SOEs based on their ownership structure (Jin et al., 2018). The ownership structure could influence the relation between the margin trading and short selling pilot program and CSR performance. Prior literature finds that the ownership dispersion is positively associated with CSR performance for Chinese firms, while concentrated ownership is positively related to CSR for SOEs (Li & Zhang, 2010). Marquis and Qian (2014) argue that non-SOEs have

[††] Following Zhang et al. (2010), we compute the $Z_{China}Score$ using the following formula: $0.517-0.460X_6+9.320X_7+0.388X_8+1.158X_9$, where X_6 is the total liabilities/total assets, X_7 is the net profit/average total assets, X_8 is the working capital/total assets, and X_9 is the retained earnings/total assets. Zhang et al. (2010) recommended cut-offs of 0.5 and 0.9 to identify financially distressed firms and financially healthy firms. Firms with a $Z_{China}Score$ between 0.5 and 0.9 are classified as potentially distressed companies requiring a close watch, suggesting that these firms are likely to attract the attention of short sellers and become the shorting target. Therefore, we classify them as the high bankruptcy risk subsample.

more motivations than SOEs to disclose their CSR information for political considerations. This difference in exerting efforts in CSR can be attributed to the different business objectives of SOEs and non-SOEs. In particular, SOEs have more social and environmental goals and strong political connections with the government. Therefore, SOEs do not care much about shareholder value and are less sensitive to bad news or economic losses (Chen et al., 2010). The introduction of short selling serves as a monitoring tool to detect financial misconduct (Karpoff & Lou, 2010), earnings management (Fang et al., 2016), and insider trading (Massa, Qian, et al., 2015), especially for SOEs. Jin et al. (2018) and S. Chen et al. (2018) find that the disciplinary effect is more pronounced for firms with higher ownership concentration in China such as SOEs. Hence, we expect that the positive effect of short selling pressure on CSR performance improvement is more salient for SOEs than non-SOEs. This is because SOEs generally exhibit poorer performance and they are more likely to manage earnings through tunneling activities (Jin et al., 2018). Moreover, SOEs might rely more on the insurance role of CSR to reduce the short selling risk.

To investigate the effects of firm ownership on changes in CSR performance, we first divide the full sample into the sub-samples of SOEs and non-SOEs. A firm is classified as a SOE if its ultimate controlling shareholder is the state government; otherwise, it is classified as a non-SOE. The information on state ownership is obtained from the CSMAR database. Next, we estimate Eq. (1) using the subsample of SOEs and non-SOEs and report the results in Table 12. The coefficient on *PILOT*×*DURING* in Column (1) is positive and significant, while it is insignificant and positive in Column (2). The Chow test result is also significant at 10% level (*Chi2* = 3.500 and *P-value* = 0.080). The results suggest that the positive effect of short selling pressure on CSR performance is more pronounced for SOEs than for non-SOEs. The

economic magnitude of the improvement of CSR performance for SOEs is pronounced with an increase in the CSR score by 3.946% for pilot SOEs.[‡‡]

<Insert Table 12 about here>

Effect of Ownership Concentration

Well-dispersed ownership is relatively rare outside of the U.S., and the presence of large shareholders with substantial blocks of shares is more common for European and Asian companies (La Porta et al., 2002). The major agency problem is the conflict of interest between controlling and minority shareholders. Specifically, the controlling shareholders expropriate the minority investors, referred to as "tunneling" (Djankov et al., 2008; Jiang et al., 2010). S. Chen et al. (2018) find that short sellers can play a disciplinary role in monitoring the tunneling behavior among controlling shareholders, as short selling targets and attacks the misconduct of firms to lower the value of controlling ownership of shareholders. Therefore, controlling shareholders confront higher risks if they hold high ownership stakes of their firms. They might preserve the corporate image to send signals that they are socially responsible and less likely to tunnel. We predict that the effect of lifting the short selling ban on CSR performance is more pronounced for firms with a high ownership concentrations.

I separately examine the effect of short selling threats on CSR performance for the high ownership concentration group and the low ownership concentration group. We divide the sample based on the ownership of the top ten controlling shareholders. Specifically, if the ownership of the top ten controlling shareholders is higher than the median ownership of the top ten controlling shareholders of the industry at the fiscal year, we classify the firm-year observation as having a high ownership concentration and otherwise as having a low ownership concentration. Table 13 reports the results. Column (1) shows that the coefficient on

[‡‡] Note that 3.946 % = 1.543/39.101. where 1.543 is the coefficient on the interaction item *GOODNEWS* × *SHORT* in Column (1) of Table 12, 39.101 is the mean *CSRscore* for the pilot firms in Panel A of Table 2.

PILOT×*DURING* is significantly positive at the 10% level, while the coefficient on *DURING* is positive but insignificant in Column (2). By applying Chow test, we find that firms with high concentrated ownership improve their CSR performance more significantly after the introduction of short selling than firms with low concentrated ownership (*Chi2* = 9.256 and *P-value* = 0.002).

<Insert Table 13 about here>

Conclusion

In this study, we examine the effect of the introduction of the short selling and margin trading pilot program in China on the CSR performance of firms. Using a pilot program as a source of exogenous shock to the removal of the constraints of margin trading and short selling, we find that the pilot firms improve CSR performance more substantially than the non-pilot firms upon introduction of the pilot program. Specifically, managers of the pilot firms significantly increase firms' CSR performance when facing increasing short selling pressure, while margin trading does not affect CSR performance. Pilot firms only improve CSR performance during the pilot period. Moreover, the positive effect of the pilot program on the performance of Chinese firms is more pronounced when firms confront higher downward prices pressures, worse earnings news, or higher bankruptcy risk. Furthermore, the disciplinary effect of short selling on CSR performance is more pronounced for firms with a high ownership concentration and on SOEs. Overall, these results are consistent with the prediction that as a response to short selling pressure, managers strategically adjust their CSR behaviors to create a positive corporate image. Therefore, firms can reduce the risk of becoming a target and deter the declining price risk when becoming a real target of short selling.

This study has policy implications for other emerging markets. Short selling is generally not allowed by the regulators in some emerging markets, as such selling is considered risky, and it can increase market volatility while undermining market confidence. The findings

suggest a positive effect of short selling on corporate engagement in CSR; and thus, these findings can have important policy implications for other countries that are planning to lift their short-selling constraints.

Reference

Adam Friedman Associates. 2012. Corporate social responsibility: Who's responsible? Summary Available at: http://www.prweb.com/releases/prweb2012/11/prweb10144917.htm.

Awaysheh, A., Heron, R. A., Perry, T., & Wilson, J. I. (2020). On the relation between corporate social responsibility and financial performance. *Strategic Management Journal*. https://doi.org/10.1002/smj.3122

Beneish, M. D., & Vargus, M. E. (2002). Insider Trading, Earnings Quality, and Accrual Mispricing. *The Accounting Review, 77*(4), 755-791. http://www.jstor.org/stable/3068870

Berger, P. G., Ofek, E. L. I., & Yermack, D. L. (1997). Managerial Entrenchment and Capital Structure Decisions. *The Journal of Finance, 52*(4), 1411-1438. https://doi.org/10.1111/j.1540-6261.1997.tb01115.x

Bhojraj, S., Bloomfield, R. J., & Tayler, W. B. (2009). Margin Trading, Overpricing, and Synchronization Risk. *Review of Financial Studies, 22*(5), 2059-2085. https://doi.org/10.1093/rfs/hhn045

Brammer, S., & Mollington, A. (2008). Does it pay to be different? an analysis of the relationship between corporate social and financial performance. *Strategic Management Journal*. https://doi.org/10.1002/smj

Brown, T. J., & Dacin, P. A. (1997). The Company and the Product: Corporate Associations and Consumer Product Responses. *Journal of Marketing, 61*(1), 68-84. https://doi.org/10.2307/1252190

Burns, N., & Kedia, S. (2006, 2006/01/01/). The impact of performance-based compensation on misreporting. *Journal of Financial Economics, 79*(1), 35-67. https://doi.org/https://doi.org/10.1016/j.jfineco.2004.12.003

Cassell, C. A., Drake, M. S., & Rasmussen, S. J. (2011, 2011/12/01). Short Interest as a Signal of Audit Risk*. *Contemporary Accounting Research, 28*(4), 1278-1297. https://doi.org/10.1111/j.1911-3846.2011.01102.x

Chang, E. C., Lin, T.-C., & Ma, X. (2015). Does short selling discipline overinvestment? *SSRN*, https://hub.hku.hk/bitstream/10722/215627/215621/Content.pdf?accept=215621.

Chang, E. C., Luo, Y., & Ren, J. (2014). Short-selling, margin-trading, and price efficiency: Evidence from the Chinese market. *Journal of Banking & Finance, 48*, 411-424. https://doi.org/10.1016/j.jbankfin.2013.10.002

Chang, X., Tan, W., Yang, E., & Zhang, W. (2018). Stock Liquidity and Corporate Social Responsibility. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3130572

Chemmanur, T. J., & He, J. (2011). IPO waves, product market competition, and the going public decision: Theory and evidence. *Journal of Financial Economics, 101*(2), 382-412. https://doi.org/10.1016/j.jfineco.2011.03.009

Chen, H., Chen, J. Z., Lobo, G. J., & Wang, Y. (2010, 2010/12/01). Association Between Borrower and Lender State Ownership and Accounting Conservatism. *Journal of Accounting Research, 48*(5), 973-1014. https://doi.org/10.1111/j.1475-679X.2010.00385.x

Chen, S., Lin, B., Lu, R., & Ma, H. (2018). The disciplinary effects of short sales on controlling shareholders. *Journal of Empirical Finance, 46*, 56-76. https://doi.org/10.1016/j.jempfin.2017.12.007

Chen, T., Dong, H., & Lin, C. (2020). Institutional shareholders and corporate social responsibility. *Journal of Financial Economics, 135*(2), 483-504. https://doi.org/10.1016/j.jfineco.2019.06.007

Chen, Y.-C., Hung, M., & Wang, Y. (2018). The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China. *Journal of Accounting and Economics, 65*(1), 169-190. https://doi.org/10.1016/j.jacceco.2017.11.009

Chen, Z., Dong, G. N., Gu, M., & Hasan, I. (2017). The Causal Effects of Margin Trading and Short Selling on Earnings Management: A Natural Experiment from China. *SSRN*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2795640.

Cheng, C. S. A., Shyu, H., & Wang, C. (2018). Accounting Comparability, Short Selling, and Price Efficiency. *SSRN*, https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxqYWFmY29uZmVyZW25jZTIwMTh28Z23g26NmUwMzJlYjdjYTAyNTliYQ.

Cheng, I.-H., Hong, H., & Shue, K. (2016). Do Managers Do Good With Other People's Money? *SSRN*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1962120.

Christophe, S. E., Ferri, M. G., & Hsieh, J. (2010). Informed trading before analyst downgrades: Evidence from short sellers. *Journal of Financial Economics, 95*(1), 85-106. https://doi.org/10.1016/j.jfineco.2009.02.004

Cochran, P. L., & Wood, R. A. (1984). Corporate Social Responsibility and Financial Performance. *Academy of Management Journal, 27*(1), 42-56. https://doi.org/10.2307/255956

De Angelis, D., Grullon, G., & Michenaud, S. (2017). The Effects of Short-Selling Threats on Incentive Contracts: Evidence from an Experiment. *The Review of Financial Studies, 30*(5), 1627-1659. https://doi.org/10.1093/rfs/hhw105

DeFond, M. L., & Park, C. W. (1997, 1997/07/01/). Smoothing income in anticipation of future earnings. *Journal of Accounting and Economics, 23*(2), 115-139. https://doi.org/https://doi.org/10.1016/S0165-4101(97)00004-9

Dehejia, R., & Wahba, S. (2002). Propensity Score-Matching Methods For Nonexperimental Causal Studies. *The Review of Economics and Statistics, 84*(1), 151-161. http://EconPapers.repec.org/RePEc:tpr:restat:v:84:y:2002:i:1:p:151-161

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *The Accounting Review, 86*(1), 59-100. https://doi.org/10.2308/accr.00000005

Diamond, D. W., & Verrecchia, R. E. (1987). Constraints on short-selling and asset price adjustment to private information. *Journal of Financial Economics, 18*(2), 277-311. https://doi.org/10.1016/0304-405x(87)90042-0

Diether, K. B., Lee, K.-H., & Werner, I. M. (2009). Short-Sale Strategies and Return Predictability. *The Review of Financial Studies, 22*(2), 575-607. https://doi.org/10.1093/rfs/hhn047

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2008). The law and economics of self-dealing. *Journal of Financial Economics, 88*(3), 430-465. https://doi.org/10.1016/j.jfineco.2007.02.007

Drake, M. S., Rees, L., & Swanson, E. P. (2011). Should Investors Follow the Prophets or the Bears? Evidence on the Use of Public Information by Analysts and Short Sellers. *The Accounting Review, 86*(1), 101-130. https://doi.org/10.2308/accr.00000006

Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics, 131*(3), 693-714. https://doi.org/10.1016/j.jfineco.2018.08.013

Eichholtz, P., Kok, N., & Quigley, J. M. (2010). Doing Well by Doing Good? Green Office Buildings [10.1257/aer.100.5.2492]. *American Economic Review, 100*(5), 2492-2509. http://www.aeaweb.org/articles?id=10.1257/aer.100.5.2492

El Ghoul, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, *35*(9), 2388-2406. https://doi.org/10.1016/j.jbankfin.2011.02.007

Engelberg, J. E., Reed, A. V., & Ringgenberg, M. C. (2012). How are shorts informed? *Journal of Financial Economics*, *105*(2), 260-278. https://doi.org/10.1016/j.jfineco.2012.03.001

Fang, V. W., Huang, A. H., & Karpoff, J. M. (2016). Short Selling and Earnings Management: A Controlled Experiment. *The Journal of Finance*, *71*(3), 1251-1294. https://doi.org/10.1111/jofi.12369

Fieseler, C. (2011, 2011/04/01). On the corporate social responsibility perceptions of equity analysts. *Business Ethics: A European Review*, *20*(2), 131-147. https://doi.org/10.1111/j.1467-8608.2011.01616.x

Flammer, C. (2012). Corporate Social Responsibility and Shareholder Reaction: The Environmental Awareness of Investors. *Academy of Management Journal*, *56*(3), 758-781. https://doi.org/10.5465/amj.2011.0744

Flammer, C. (2015). Does Corporate Social Responsibility Lead to Superior Financial Performance? A Regression Discontinuity Approach. *Management Science*, *61*(11), 2549-2568. https://doi.org/10.1287/mnsc.2014.2038

Fombrun, C., & Shanley, M. (1990). What's in a Name? Reputation Building and Corporate Strategy. *Academy of Management Journal*, *33*(2), 233-258. https://doi.org/10.5465/256324

Fombrun, C. J., Gardberg, N. A., & Barnett, M. L. (2000, 2000/01/01). Opportunity Platforms and Safety Nets: Corporate Citizenship and Reputational Risk. *Business and Society Review*, *105*(1), 85-106. https://doi.org/10.1111/0045-3609.00066

Gao, F., Lisic, L. L., & Zhang, I. X. (2014). Commitment to social good and insider trading. *Journal of Accounting and Economics, 57*(2-3), 149-175. https://doi.org/10.1016/j.jacceco.2014.03.001

Godfrey, P. C. (2005). The Relationship between Corporate Philanthropy and Shareholder Wealth: A Risk Management Perspective. *Academy of Management Review, 30*(4), 777-798. https://doi.org/10.5465/amr.2005.18378878

Godfrey, P. C., Merrill, C. B., & Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: an empirical test of the risk management hypothesis. *Strategic Management Journal, 30*(4), 425-445. https://doi.org/10.1002/smj.750

Greening, D. W., & Turban, D. B. (2000). Corporate Social Performance As a Competitive Advantage in Attracting a Quality Workforce. *Business & Society, 39*(3), 254-280. https://doi.org/10.1177/000765030003900302

Grullon, G., Michenaud, S., & Weston, J. P. (2015). The Real Effects of Short-Selling Constraints. *The Review of Financial Studies, 28*(6), 1737-1767. https://doi.org/10.1093/rfs/hhv013

Guan, Y., Su, L., Wu, D., & Yang, Z. (2016, 2016/04/01/). Do school ties between auditors and client executives influence audit outcomes? *Journal of Accounting and Economics, 61*(2), 506-525. https://doi.org/https://doi.org/10.1016/j.jacceco.2015.09.003

Hardouvelis, G. A., & Peristiani, S. (1992). Margin Requirements, Speculative Trading, and Stock Price Fluctuations: The Case of Japan. *The Quarterly Journal of Economics, 107*(4), 1333-1370. https://doi.org/10.2307/2118391

Hasan, I., Chun, K., Wu, Q., & Zhang, H. (2020). Is social capital associated with corporate innovation? Evidence from publicly listed firms in the U.S. *Journal of Corporate Finance*. https://doi.org/10.1016/j.jcorpfin.2020.101623

Hemingway, C. A., & Maclagan, P. W. (2004). Managers' Personal Values as Drivers of Corporate Social Responsibility. *Journal of Business Ethics*(50), 33-44. https://doi.org/10.1023/B:BUSI.0000020964.80208.c9

Hirose, T., Kato, H. K., & Bremer, M. (2009, 2009/01/01/). Can margin traders predict future stock returns in Japan? *Pacific-Basin Finance Journal*, *17*(1), 41-57. https://doi.org/https://doi.org/10.1016/j.pacfin.2008.01.001

Hoi, C. K., Wu, Q., & Zhang, H. (2013). Is Corporate Social Responsibility (CSR) Associated with Tax Avoidance? Evidence from Irresponsible CSR Activities. *The Accounting Review*, *88*(6), 2025-2059. https://doi.org/10.2308/accr-50544

Hong, H., & Liskovich, I. (2016). Crime, Punishment and the Value of Corporate Social Responsibility. *SSRN*, https://ssrn.com/abstract=2492202.

Hope, O.-K., Hu, D., & Zhao, W. (2017). Third-party consequences of short-selling threats: The case of auditor behavior. *Journal of Accounting and Economics*, *63*(2-3), 479-498. https://doi.org/10.1016/j.jacceco.2016.09.006

Hsieh, D. A., & Miller, M. H. (1990, 1990/03/01). Margin Regulation and Stock Market Volatility. *The Journal of Finance*, *45*(1), 3-29. https://doi.org/10.1111/j.1540-6261.1990.tb05078.x

Jiang, G., Lee, C. M. C., & Yue, H. (2010). Tunneling through intercorporate loans: The China experience ☆ . *Journal of Financial Economics*, *98*(1), 1-20. https://doi.org/10.1016/j.jfineco.2010.05.002

Jin, Z., Lin, B., Yang, X., & Zhang, T. (2018). Accounting conservatism and short selling: Evidence from China. *Journal of Business Finance & Accounting*, *45*(3-4), 352-394. https://doi.org/10.1111/jbfa.12302

Karpoff, J. M., & Lou, X. (2010). Short Sellers and Financial Misconduct. *The Journal of Finance*, *65*(5), 1879-1913. https://doi.org/10.1111/j.1540-6261.2010.01597.x

Khan, M., & Lu, H. (2013). Do Short Sellers Front-Run Insider Sales? *The Accounting Review, 88*(5), 1743-1768. https://doi.org/10.2308/accr-50485

Khanna, N., & Mathews, R. D. (2012). Doing battle with short sellers: The conflicted role of blockholders in bear raids. *Journal of Financial Economics, 106*(2), 229-246. https://doi.org/10.1016/j.jfineco.2012.06.006

Kim, H.-D., Kim, T., Kim, Y., & Park, K. (2019). Do long-term institutional investors promote corporate social responsibility activities? *Journal of Banking & Finance, 101*, 256-269. https://doi.org/10.1016/j.jbankfin.2018.11.015

Kim, I., Wan, H., Wang, B., & Yang, T. (2019). Institutional Investors and Corporate Environmental, Social, and Governance Policies: Evidence from Toxics Release Data. *Management Science*. https://doi.org/10.1287/mnsc.2018.3055

Kim, Y., Li, H., & Li, S. (2014). Corporate social responsibility and stock price crash risk. *Journal of Banking & Finance, 43*, 1-13. https://doi.org/10.1016/j.jbankfin.2014.02.013

Kim, Y., Park, M. S., & Wier, B. (2012). Is Earnings Quality Associated with Corporate Social Responsibility? *The Accounting Review, 87*(3), 761-796. https://doi.org/10.2308/accr-10209

Klein, B., & Leffler, K. B. (1981). The Role of Market Forces in Assuring Contractual Performance. *Journal of Political Economy, 89*(4), 615-641. http://www.jstor.org/stable/1833028

Koh, P.-S., Qian, C., & Wang, H. (2014). Firm litigation risk and the insurance value of corporate social performance. *Strategic Management Journal, 35*(10), 1464-1482. https://doi.org/10.1002/smj.2171

La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (2002). Government Ownership of Banks. *The Journal of Finance, 57*(1), 265-301. https://doi.org/10.1111/1540-6261.00422

Lanis, R., & Richardson, G. (2012). Corporate social responsibility and tax aggressiveness: An empirical analysis. *Journal of Accounting and Public Policy, 31*(1), 86-108. https://doi.org/10.1016/j.jaccpubpol.2011.10.006

Lee, D. D., & Faff, R. W. (2009). Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective. *Financial Review, 44*(2), 213-237. https://doi.org/10.1111/j.1540-6288.2009.00216.x

Li, W. J., & Zhang, R. (2010, Nov). Corporate Social Responsibility, Ownership Structure, and Political Interference: Evidence from China. *Journal of Business Ethics*, *96*(4), 631-645. https://doi.org/10.1007/s10551-010-0488-z

Li, Y., & Zhang, L. (2015). Short Selling Pressure, Stock Price Behavior, and Management Forecast Precision: Evidence from a Natural Experiment. *Journal of Accounting Research*, *53*(1), 79-117. https://doi.org/10.1111/1475-679x.12068

Li, Z., Lin, B., Zhang, T., & Chen, C. (2017). Does short selling improve stock price efficiency and liquidity? Evidence from a natural experiment in China. *The European Journal of Finance*, 1-23. https://doi.org/10.1080/1351847x.2017.1307772

Lins, K. V., Servaes, H., & Tamayo, A. (2017, Aug). Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis. *JOURNAL OF FINANCE*, *72*(4), 1785-1823. https://doi.org/10.1111/jofi.12505

Lu, L. Y., Yu, Y., & Zhang, L. (2016). Short Selling Pressure and Corporate Social Responsibility Performance: Evidence from a Natural Experiment. *SSRN*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3166472.

Lys, T., Naughton, J. P., & Wang, C. (2015). Signaling through corporate accountability reporting. *Journal of Accounting and Economics, 60*(1), 56-72. https://doi.org/10.1016/j.jacceco.2015.03.001

Marquis, C., & Qian, C. (2014). Corporate Social Responsibility Reporting in China: Symbol or Substance? *Organization Science*, *25*(1), 127-148. https://doi.org/10.1287/orsc.2013.0837

Massa, M., Qian, W., Xu, W., & Zhang, H. (2015). Competition of the informed: Does the presence of short sellers affect insider selling? *Journal of Financial Economics*, *118*(2), 268-288. https://doi.org/10.1016/j.jfineco.2015.08.004

Massa, M., Zhang, B., & Zhang, H. (2015). The Invisible Hand of Short Selling: Does Short Selling Discipline Earnings Management? *The Review of Financial Studies*, *28*(6), 1701-1736. https://doi.org/10.1093/rfs/hhu147

Masulis, R. W., & Reza, S. W. (2015). Agency Problems of Corporate Philanthropy. *Review of Financial Studies*, *28*(2), 592-636. https://doi.org/10.1093/rfs/hhu082

Maxwell, John W., Lyon, Thomas P., & Hackett, Steven C. (2000, 2000/10/01). Self - Regulation and Social Welfare: The Political Economy of Corporate Environmentalism. *The Journal of Law and Economics*, *43*(2), 583-618. https://doi.org/10.1086/467466

McGuire, J. B., Sundgren, A., & Schneeweis, T. (1988). Corporate Social Responsibility and Firm Financial Performance. *The Academy of Management Journal*, *31*(4), 854-872. https://doi.org/10.2307/256342

McWilliams, A., & Siegel, D. (2000). Corporate social responsibility and financial performance: correlation or misspecification? *Strategic Management Journal*, *21*(5), 603-609. https://doi.org/10.1002/(sici)1097-0266(200005)21:5<603::aid-smj101>3.0.co;2-3

McWilliams, A., & Siegel, D. (2001). Corporate Social Responsibility: A Theory of the Firm Perspective. *Academy of Management Review*, *26*(1), 117-127. https://doi.org/10.5465/amr.2001.4011987

McWilliams, A., Siegel, D. S., & Wright, P. M. (2006). Corporate Social Responsibility: Strategic Implications*. *Journal of Management Studies, 43*(1), 1-18. https://doi.org/10.1111/j.1467-6486.2006.00580.x

Mei, J., Scheinkman, J., & Xiong, W. (2009). *Speculative Trading and Stock Prices: Evidence from Chinese A-B Share Premia*. https://EconPapers.repec.org/RePEc:cuf:wpaper:504

Meng, Q., Li, X., Chan, K. C., & Gao, S. (2020). Does short selling affect a firm's financial constraints? *Journal of Corporate Finance, 60*. https://doi.org/10.1016/j.jcorpfin.2019.101531

Miller, E. M. (1977). Risk, Uncertainty, and Divergence of Opinion. *The Journal of Finance, 32*(4), 1151-1168. https://doi.org/10.1111/j.1540-6261.1977.tb03317.x

Minor, D., & Morgan, J. (2011, 2011/05/01). CSR as Reputation Insurance: Primum Non Nocere. *California Management Review, 53*(3), 40-59. https://doi.org/10.1525/cmr.2011.53.3.40

Moser, D. V., & Martin, P. R. (2012). A Broader Perspective on Corporate Social Responsibility Research in Accounting. *The Accounting Review, 87*(3), 797-806. https://doi.org/10.2308/accr-10257

Myers, S. C. (1984). The Capital Structure Puzzle. *The Journal of Finance, 39*(3), 574-592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Ni, X., & Zhang, H. (2019). Mandatory corporate social responsibility disclosure and dividend payouts: evidence from a quasi-natural experiment. *Accounting & Finance, 58*(5), 1581-1612. https://doi.org/10.1111/acfi.12438

Purnanandam, A., & Seyhun, H. N. (2018, Jun). Do Short Sellers Trade on Private Information or False Information? *Journal of Financial and Quantitative Analysis, 53*(03), 997-1023. https://doi.org/10.1017/s0022109017001223

Seguin, P. J. (1990). Stock volatility and margin trading. *Journal of Monetary Economics*, *26*(1), 101-121. https://doi.org/10.1016/0304-3932(90)90033-z

Servaes, H., & Tamayo, A. (2013). The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness. *Management Science*, *59*(5), 1045-1061. https://doi.org/10.1287/mnsc.1120.1630

Tan, W., Tsang, A., Wang, W., & Zhang, W. (2019). Corporate Social Responsibility (CSR) Disclosure and the Choice between Bank Debt and Public Debt. *Accounting Horizons*, *34*(1), 151-173. https://doi.org/10.2308/acch-52631

Wang, K., Wang, R., Wei, K. C. J., Zhang, B., & Zhou, Y. (2018). Insider Sales under the Threat of Short Sellers: New Hypothesis and New Tests. *SSRN*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2724532.

Wang, M., Qiu, C., & Kong, D. (2011). Corporate Social Responsibility, Investor Behaviors, and Stock Market Returns: Evidence from a Natural Experiment in China. *Journal of Business Ethics*, *101*(1), 127-141. https://doi.org/10.1007/s10551-010-0713-9

Zhang, L., Altman, E. I., & Yen, J. (2010, 2010/06/01). Corporate financial distress diagnosis model and application in credit rating for listing firms in China. *Frontiers of Computer Science in China*, *4*(2), 220-236. https://doi.org/10.1007/s11704-010-0505-5

Table 1

Sample selection and composition

Panel A Sample selection			
	Pilot	Non-pilot	Total
All A share firm-year observations	7,784	10,673	18,457
Exclude firms in financial industry	7,429	10,484	17,913
Exclude observations with a missing *CSRscore* or other variables	3,107	1,315	4,422
Exclude observations of the year when the firm is first included in the pilot program	2,275	1133	3,408
Panel B Sample distribution by year			
Year	*Freq.*	*Percent*	*Cum.*
2008	307	9.01%	9.01%
2009	385	11.30%	20.31%
2010	369	10.83%	31.13%
2011	371	10.89%	42.02%
2012	539	15.82%	57.83%
2013	372	10.92%	68.75%
2014	497	14.58%	83.33%
2015	568	16.67%	100.00%
Total	3,408	100.00%	
Panel C Sample distribution of the pilot firms before and during the pilot program			
	Freq.	*Percent*	*Cum.*
6 years before included in the pilot list	21	0.92%	0.92%
5 years before included in the pilot list	98	4.31%	5.23%
4 years before included in the pilot list	126	5.54%	10.77%
3 years before included in the pilot list	217	9.54%	20.31%
2 years before included in the pilot list	308	13.54%	33.85%
1 year before included in the pilot list	358	15.74%	49.58%
1 year after included in the pilot list	401	17.63%	67.21%
2 years after included in the pilot list	344	15.12%	82.33%
3 years after included in the pilot list	176	7.74%	90.07%
4 years after included in the pilot list	164	7.21%	97.27%
5 years after included in the pilot list	62	2.73%	100.00%
Total of pilot firm-year observations	2,275	100.00%	

Notes: Panel A shows the sample selection process. Panel B shows the sample distribution by year. Panel C shows the sample distributions of the pilot firms before and during the pilot program.

Table 2

Descriptive statistics and correlations

Panel A Descriptive statistics of the full sample

Variable	*N*	*SD*	*Mean*	*Min*	*P25*	*P50*	*P75*	*Max*
CSRscore	3,408	12.271	37.567	13.330	28.967	34.910	43.097	87.950
SIZE	3,408	1.373	22.900	18.878	21.884	22.789	23.804	25.726
LEV	3,408	0.199	0.492	0.043	0.345	0.506	0.648	1.215
PPE	3,408	0.188	0.255	0.002	0.104	0.212	0.378	0.741
ROA	3,408	0.051	0.048	-0.243	0.019	0.041	0.074	0.220
AGE	3,408	5.010	14.251	0.000	11.000	14.000	17.000	32.000
GROWTH	3,408	1.237	0.371	-0.796	-0.045	0.109	0.361	12.785
TOBINQ	3,408	1.673	1.694	0.208	0.628	1.208	2.108	13.126
LIQUIDITY	3,408	0.249	0.796	0.149	0.600	0.927	1.000	1.000
CAPEX	3,408	0.052	0.061	0.000	0.023	0.048	0.086	0.256
ANALYST	3,408	0.884	2.304	0.693	1.609	2.398	2.996	4.190
BIG4	3,408	0.363	0.156	0	0	0	0	1
DUAL	3,408	0.362	0.155	0	0	0	0	1

Panel B Comparison between pilot and non-pilot firms (full sample)

	Non-Pilot Firms		Pilot Firms		
Variables	*N*	*Mean*	*N*	*Mean*	*Difference*
CSRscore	1,133	34.486	2,275	39.101	-4.614***
SIZE	1,133	21.994	2,275	23.351	-1.357***
LEV	1,133	0.461	2,275	0.508	-0.047***
PPE	1,133	0.280	2,275	0.242	0.038***
ROA	1,133	0.042	2,275	0.051	-0.009***
AGE	1,133	13.475	2,275	14.638	-1.163***
GROWTH	1,133	0.292	2,275	0.411	-0.119***
TOBINQ	1,133	1.744	2,275	1.669	0.076
LIQUIDITY	1,133	0.734	2,275	0.827	-0.093***
CAPEX	1,133	0.065	2,275	0.059	0.006***
ANALYST	1,133	1.919	2,275	2.495	-0.575***
BIG4	1,133	0.048	2,275	0.210	-0.162***
DUAL	1,133	0.174	2,275	0.145	0.028**

Table 2 - Continued

Panel C Pearson's correlation coefficients and Spearman's rank correlation

	CSRscore	*SHORT*	*SIZE*	*LEV*	*PPE*	*ROA*	*AGE*
CSRscore		0.374***	0.363***	0.071***	0.030*	-0.020	0.113***
SHORT	0.364***		0.481***	0.095***	-0.080***	-0.067***	0.264***
SIZE	0.442***	0.486***		0.540***	0.058***	-0.218***	0.185***
LEV	0.106***	0.092***	0.540***		-0.003	-0.523***	0.147***
PPE	0.055***	-0.075***	0.122***	0.063***		-0.168***	-0.060***
ROA	-0.027	-0.052***	-0.171***	-0.483***	-0.177***		-0.112***
AGE	0.066***	0.253***	0.159***	0.158***	-0.048***	-0.093***	
GROWTH	-0.062***	0.036**	0.028*	0.105***	-0.232***	0.009	0.112***
TOBINQ	-0.117***	-0.057***	-0.488***	-0.523***	-0.190***	0.413***	-0.095***
LIQUDITY	0.123***	0.291***	0.207***	0.211***	0.076***	-0.156***	0.304***
CAPEX	-0.022	-0.136***	-0.050***	-0.081***	0.357***	0.071***	-0.178***
ANALYST	0.158***	0.124***	0.296***	-0.062***	0.006	0.398***	-0.156***
BIG4	0.325***	0.162***	0.447***	0.121***	0.060***	0.028	-0.006
DUAL	-0.051***	-0.013	-0.157***	-0.143***	-0.107***	0.092***	-0.016

	GROWTH	*TOBINQ*	*LIQUDITY*	*CAPEX*	*ANALYST*	*BIG4*	*DUAL*
CSRscore	-0.024	-0.111***	0.111***	-0.015	0.117***	0.247***	-0.018
SHORT	0.057***	-0.112***	0.232***	-0.123***	0.118***	0.162***	-0.013
SIZE	-0.032*	-0.630***	0.191***	-0.067***	0.281***	0.419***	-0.162***
LEV	0.049***	-0.686***	0.184***	-0.140***	-0.065***	0.112***	-0.137***
PPE	-0.333***	-0.141***	0.077***	0.475***	0.006	0.038**	-0.095***
ROA	0.001	0.526***	-0.179***	0.079***	0.427***	0.029*	0.115***
AGE	0.052***	-0.133***	0.272***	-0.193***	-0.170***	-0.002	-0.017
GROWTH		0.091***	-0.012	-0.205***	-0.037**	-0.066***	0.010
TOBINQ	0.019		-0.227***	0.070***	0.112***	-0.195***	0.195***
LIQUDITY	0.025	-0.176***		-0.131***	-0.140***	0.073***	-0.100***
CAPEX	-0.159***	-0.002	-0.128***		0.221***	0.065***	0.030*
ANALYST	-0.045***	0.100***	-0.094***	0.199***		0.188***	0.030*
BIG4	-0.035**	-0.155***	0.055***	0.044***	0.188***		-0.077***
DUAL	-0.023	0.183***	-0.089***	0.037**	0.030*	-0.077***	

Notes: Panel A of this table presents the descriptive statistics for the full sample. Panel B of this table presents the comparison between the pilot and non-pilot firms. Panel C of this table presents Pearson's correlation coefficients and Spearman's rank correlation among the main regression variables. Specifically, the lower-triangular cells report Pearson's correlation coefficients, and the upper-triangular cells are Spearman's rank correlation. Continuous variables are winsorized at the 1st and 99th percentiles of their distributions. Variable definitions are provided in Appendix 2. ***, **, and * indicate significance at the .01, .05, and .10 levels, respectively.

Table 3

Univariate Analysis

Panel A Cross-sectional Comparison

	Pilot Firms		Non-Pilot Firms		Cross-sectional Estimator	
CSR performance	*Mean*	*Median*	*Mean*	*Median*	*Difference in Mean*	*Difference in Median*
PRE	34.252	31.380	28.341	27.050	5.911 (t = -7.202)	4.330 (z = -7.885)
DURING	43.997	41.087	35.876	34.106	8.121 (t = -15.760)	6.981 (z = -14.854)

Panel B Univariate DiD Test

	Pilot Diff	*Non-Pilot Diff*	*DiD Estimator*
CSR performance (DURING – PRE)	9.745***	7.535***	2.210**
t-statistics	-18.558	-11.294	2.234

Notes: Panel A reports the summary statistics on the level of annual CSR performance for the sample of pilot firms and non-pilot firms for the period before and during the deregulation of the short selling and margin trading pilot program and the differences in the mean and median. Panel B shows the univariate results of the difference-in-differences (DiD) tests. The sample comes from the list of pilot programs and contains firms that have data available to calculate firm characteristics and CSR performance over the entire sample period (2008 to 2015). A firm is classified into the treatment group if its stock is designated as a pilot stock during the program and into the benchmark group otherwise. As for pilot firms, we define the period before the pilot firms are added into the pilot list as *PRE*, and the period after entering the pilot list as *DURING*. As for non-pilot firms, we define the two years before the pilot program (2008 and 2009) as *PRE*, and the years after the pilot program (2011 to 2015) as *DURING*. Variable definitions are provided in Appendix 2. ***, **, and * indicate the significance at the .01, .05 and .10 levels, respectively (two-tailed test).

Table 4

Effect of the removal of the short-selling and margin-trading bans on CSR performance (full sample)

	CSRscore			*ΔCSRscore*		
	(1)	(2)	(3)	(4)	(5)	(6)
PILOT* × *DURING	**1.603*** (3.484)**	**1.201*** (2.576)**	**1.422*** (2.984)**	**1.920*** (4.092)**	**1.499*** (3.152)**	**1.732*** (3.552)**
PILOT	2.934*** (4.409)	-0.030 (-0.042)		2.898*** (4.399)	-0.020 (-0.029)	
SIZE		2.109*** (6.046)	0.772 (1.268)		2.040*** (5.923)	0.613 (0.994)
LEV		0.692 (0.452)	2.053 (1.081)		0.948 (0.614)	2.634 (1.359)
PPE		3.260** (2.252)	3.204* (1.737)		2.653* (1.832)	2.702 (1.440)
ROA		9.563** (2.510)	10.679** (2.571)		5.848 (1.528)	6.864 (1.641)
AGE		-0.149** (-1.982)	1.623*** (11.153)		-0.152** (-2.049)	-0.094 (-0.650)
GROWTH		-0.332*** (-4.120)	-0.300*** (-3.504)		-0.294*** (-4.024)	-0.272*** (-3.496)
TOBINQ		-0.005 (-0.047)	0.005 (0.039)		-0.039 (-0.336)	-0.046 (-0.351)
LIQUIDITY		0.270 (0.387)	0.182 (0.250)		0.523 (0.728)	0.435 (0.580)
CAPEX		-0.752 (-0.243)	-0.823 (-0.249)		-1.420 (-0.455)	-1.140 (-0.344)
ANALYST		0.381* (1.692)	0.371 (1.516)		0.416* (1.846)	0.397 (1.631)
BIG4		3.741*** (3.668)	1.660 (1.263)		3.663*** (3.630)	1.394 (1.084)
DUAL		-0.633 (-1.303)	-0.426 (-0.760)		-0.748 (-1.577)	-0.564 (-1.034)
Constant	22.462*** (11.429)	-22.074*** (-3.039)	-10.967 (-0.880)	-0.466 (-0.305)	-43.393*** (-6.050)	-12.033 (-0.967)
Observations	3,408	3,408	3,408	3,408	3,408	3,408
Adjusted R^2	0.450	0.456	0.461	0.045	0.051	0.060
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	No	No	Yes

Notes: This table reports the results of regressions estimating the difference-in-differences (DiD) in the CSR performance of pilot firms and non-pilot firms for the periods before and during the pilot program. We estimate the following model using annual data: $CSRscore_{i,t}\ (CSR\_ADJ_{i,t}) = \beta_0 + \beta_1 PILOT_i \times DURING_t + \beta_2 PILOT_i + \beta_k Controls_{i,t} + \varepsilon_{i,t}$ in Columns (2) and (5). We only keep $PILOT_i \times DURING_t$ and $PILOT_i$ in Columns (1) and (4), and omit $PILOT_i$ in Columns (3) and (6) to avoid multicollinearity. Fixed effects for industry level and year level are included in all regressions but are not reported. Variables definitions are provided in Appendix 2. The *z*-statistics are based on robust standard errors clustered by firm and are displayed

in parentheses. ***, **, and * indicate the significance at the .01, .05 and .10 levels, respectively (two-tailed test).

Table 5

Separate effects of short selling and margin trading on CSR performance

	CSRscore			*ΔCSRscore*		
	(1)	(2)	(3)	(4)	(5)	(6)
SHORT	**4.961*** **		**4.888*** **			
	(3.213)		**(3.140)**			
MARGIN		**0.006**	**0.001**			
		(0.948)	**(0.207)**			
Δ*SHORT*				**2.391** **		**2.326***
				(2.005)		**(1.962)**
Δ*MARGIN*					**0.009**	**0.008**
					(1.218)	**(1.114)**
SIZE	0.800	0.973	0.792	0.411	0.432	0.402
	(1.321)	(1.623)	(1.306)	(0.716)	(0.754)	(0.702)
LEV	1.775	1.683	1.804	-1.469	-1.452	-1.505
	(0.949)	(0.897)	(0.959)	(-0.764)	(-0.755)	(-0.782)
PPE	3.068*	3.059*	3.085*	1.931	1.806	1.917
	(1.672)	(1.661)	(1.683)	(1.014)	(0.946)	(1.007)
ROA	10.600**	10.344**	10.631**	3.840	3.582	3.720
	(2.563)	(2.499)	(2.571)	(0.893)	(0.832)	(0.870)
AGE	1.723***	1.695***	1.717***	-0.585***	-0.615***	-0.589***
	(11.700)	(11.332)	(11.489)	(-4.046)	(-4.291)	(-4.059)
GROWTH	-0.299***	-0.305***	-0.298***	-0.233**	-0.227**	-0.229**
	(-3.520)	(-3.528)	(-3.510)	(-2.514)	(-2.471)	(-2.473)
TOBINQ	-0.026	-0.001	-0.026	0.135	0.177	0.137
	(-0.206)	(-0.007)	(-0.206)	(0.866)	(1.148)	(0.880)
LIQUIDITY	0.341	0.376	0.361	1.803**	1.872**	1.878**
	(0.465)	(0.510)	(0.491)	(2.039)	(2.089)	(2.096)
CAPEX	-1.346	-0.915	-1.331	5.134	5.365	5.165
	(-0.409)	(-0.276)	(-0.404)	(1.499)	(1.565)	(1.510)
ANALYST	0.357	0.366	0.358	-0.027	-0.034	-0.031
	(1.455)	(1.489)	(1.460)	(-0.106)	(-0.134)	(-0.122)
BIG4	1.655	1.544	1.656	-3.143*	-3.170*	-3.132*
	(1.266)	(1.167)	(1.267)	(-1.764)	(-1.789)	(-1.764)
DUAL	-0.466	-0.390	-0.463	-0.101	-0.077	-0.101
	(-0.832)	(-0.690)	(-0.827)	(-0.194)	(-0.148)	(-0.195)
Constant	-12.548	-16.092	-12.331	0.961	0.729	1.251
	(-1.018)	(-1.310)	(-0.997)	(0.076)	(0.058)	(0.099)
Observations	3,408	3,408	3,408	2,734	2,734	2,734
Adjusted R^2	0.461	0.458	0.461	0.069	0.068	0.069
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table shows that the effects of short selling and margin trading on CSR performance using pooling regression with fixed effects for industry, year, and firm. We test the effects of short selling and margin trading by estimating the following model: $CSRscore[\Delta CSRscore]=\alpha_0+\alpha_1 MARGIN[\Delta MARGIN]+\alpha_2 SHORT[\Delta SHORT]+\alpha_k Controls+Industry\ FE+\ Year\ FE+Firm\ FE+\epsilon$. Columns (1)–(3) report the results of the pool regression with fixed effects. Columns (4)–(6) report the results of the first difference model. Variable definitions are provided in Appendix 2. The *z-statistics* are based on robust standard errors clustered by firm and are displayed in parentheses. ***, **, and * indicate the significance at the .01, .05, and .10 levels, respectively (two-tailed test).

Table 6

Robust checks

Panel A Parallel trend test		
	CSRscore	*t-value*
	(1)	(2)
PILOT	-4.408***	(-2.658)
PILOT×BEFORE5	-1.476	(-0.959)
PILOT×BEFORE4	0.685	(0.442)
PILOT×BEFORE3	0.732	(0.486)
PILOT×BEFORE2	0.728	(0.468)
PILOT×BEFORE1	1.881	(1.177)
PILOT×AFTER1	**4.454*** **	**(2.649)**
PILOT×AFTER2	**4.223** **	**(2.470)**
PILOT×AFTER3	**7.181*** **	**(4.037)**
PILOT×AFTER4	**6.996*** **	**(3.840)**
PILOT×AFTER5	**7.123*** **	**(3.678)**
Control variables	Yes	
Observations	3,408	
Adjusted R^2	0.432	
Industry FE	Yes	
Year FE	No	
Firm FE	No	

Panel B Effect of short selling and margin trading on CSR performance (PSM sample)		
	(1)	(2)
PILOT×DURING	**1.168***	**1.351***
	(1.707)	**(1.920)**
PILOT	0.676	
	(0.792)	
Control variables	Yes	Yes
Observations	1,853	1,853
Adjusted R^2	0.457	0.460
Industry FE	Yes	Yes
Year FE	Yes	Yes
Firm FE	No	Yes

Table 6 - Continued

Panel C Placebo tests

	Including the pilot entry year: *during period*		Including the pilot entry year: *before period*		Years after 2010 set as *during* for non-pilot firms
	(1)	(2)	(3)	(4)	(5)
PILOT×DURING	**0.698***	**0.831****	**1.099*****	**1.262*****	**2.275*****
	(1.739)	**(2.048)**	**(2.979)**	**(3.368)**	**(2.808)**
PILOT	0.170		0.107		-0.990
	(0.242)		(0.155)		(-1.240)
DURING					-1.416*
					(-1.934)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	3,790	3,790	3,790	3,790	3,408
Adjusted R^2	0.435	0.439	0.437	0.441	0.458
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No

Notes: Panel A of this table reports DiD estimates from regressions of the CSR performance of pilot firms on the Chinese margin-trading and short-selling pilot program for the period 2008–2015. We include 10 indicator variables (*BEFORE1, BEFORE2, BEFORE3, BEFORE4, BEFORE5, AFTER1, AFTER2, AFTER3, AFTER4,* and *AFTER5*) to examine the timing of changes in the CSR performance of pilot firms relative to the timing of the completion of their cross-border acquisitions. Panel B reports the DiD results with propensity score matching. Panel C shows the results of the placebo tests, when including the year of entering the pilot program in the "during" period and "before" period and manually sets the year after 2010 as the "during" period for the non-pilot firms. Variable definitions are provided in Appendix 2. The *z*-statistics are based on robust standard errors clustered by firm and are displayed in parentheses. ***, **, and * indicate the significance at the .01, .05, and .10 levels, respectively (two-tailed test).

Table 7

Effects of the pilot program on CSR performance before, during, and after the pilot program

	Before vs. During		Before vs. During vs. After		Before vs. After	
	(1)	(2)	(3)	(4)	(5)	(6)
PILOT	-0.168 (-0.237)		-0.173 (-0.245)		0.359 (0.522)	
PILOT*×*DURING	**1.362***** **(2.639)**	**1.639***** **(3.113)**	**1.392***** **(2.698)**	**1.667***** **(3.169)**		
PILOT*×*POST			**1.960** **(1.334)**	**2.482** **(1.580)**	**0.799** **(0.941)**	**1.078** **(1.358)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,368	3,368	3,408	3,408	3,408	3,408
Adjusted R^2	0.453	0.458	0.457	0.462	0.453	0.458
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes

Notes: The table presents the results from the placebo test. We include variables representing both the during period and post-period of the pilot program (*DURING* and *POST*) to examine the effects of the pilot program on the CSR performance of firms after the firm is excluded from the pilot list. Continuous variables are winsorized at the 1st and 99th percentiles of their distributions. The two-tailed *z*-statistics in parentheses are based on heteroscedasticity-robust standard errors clustered by country. Variable definitions are provided in Appendix 2. ***, **, and * indicate the significance at the .01, .05, and .10 levels, respectively.

Table 8

Effects of the pilot program on CSR performance for short interest

	CSRscore	*CSRscore_ADJ*
	(1)	(2)
PILOT×DURING	**0.979***	**1.332*****
	(1.948)	**(2.616)**
PILOT	-0.013	-0.008
	(-0.018)	(-0.012)
SHORTINTEREST	**1.782**	**1.338**
	(1.095)	**(0.784)**
Control variables	Yes	Yes
Observations	3408	3408
Adjusted R^2	0.344	0.201
Industry FE	Yes	Yes
Year FE	Yes	Yes

Notes: The table reports the regression results on the differences in the CSR performance of pilot and non-pilot firms for the periods before and during the pilot program controlling for short interest. Continuous variables are winsorized at the 1st and 99th percentiles of their distributions. The two-tailed *z*-statistics reported in parentheses are based on heteroscedasticity-robust standard errors clustered by firm. ∗∗∗, ∗∗, and ∗ indicate the statistical significance at the .01, .05, and .10 levels (two-sided), respectively. Appendix 2 contains the variable definitions.

Table 9

Effects of downward price pressure on CSR performance when firms become targets of short-selling

	CSRscore	*CSRscore_ADJ*
	(1)	(2)
PILOT×DURING	1.166**	1.464***
	(2.500)	(3.079)
SHORTPRESS×PILOT×DURING	**0.139*** **	**0.113** **
	(3.025)	**(2.320)**
PILOT	-0.063	-0.051
	(-0.090)	(-0.074)
SHORTPRESS×PILOT	-0.135***	-0.110**
	(-2.968)	(-2.259)
Control variables	Yes	Yes
Observations	3,408	3,408
Adjusted R^2	0.343	0.201
Industry FE	Yes	Yes
Year FE	Yes	Yes

Notes: The table presents results on the regression analysis of downward price pressure on CSR performance when firms become the target of short sellers. *SHORTPRESS* measures downward price pressure. The two-tailed *z*-statistics reported in parentheses are based on heteroscedasticity-robust standard errors clustered by firm. ∗∗∗, ∗∗, and ∗ indicate the statistical significance at the .01, .05, and .10 levels (two-sided), respectively. Appendix 2 contains the variable definitions.

Table 10

Effects of earnings news on the relation between the margin-trading and short-selling pilot program and CSR performance: good earnings news vs. bad earnings news

	Good earnings news	Bad earnings news
	(1)	(2)
PILOT×DURING	**-0.550**	**2.134***
	(-0.517)	**(1.811)**
PILOT	-0.774	-0.724
	(-0.633)	(-0.616)
Control variables	Yes	Yes
Observations	1,921	1,487
Adjusted R^2	0.312	0.400
Industry FE	Yes	Yes
Year FE	Yes	Yes
Chow test		
Chi2	4.900**	
P-value	0.027	

Notes: The table presents the results on the changes in CSR performance regarding the margin-trading and short-selling pilot program in good earnings news and bad earnings news groups. Good (or bad) earnings news is defined as the ROA above (or below) the industry median. The *z*-statistics reported in the parentheses are based on heteroscedasticity-robust standard errors clustered by firm. *, **,and *** indicate the statistical significance at the .10, .05, and .01 levels (two-sided), respectively. Appendix 2 contains the variable definitions.

Table 11

Effects of bankruptcy risk on the relation between the margin-trading and short-selling pilot program and CSR performance: high bankruptcy risk vs. low bankruptcy risk

	High bankruptcy risk	Low bankruptcy risk
	(1)	(2)
PILOT×DURING	**1.559****	**0.263**
	(2.156)	**(0.451)**
PILOT	0.437	-1.224
	(0.493)	(-1.248)
Control variables	Yes	Yes
Observations	1,742	1,666
Adjusted R^2	0.440	0.487
Industry FE	Yes	Yes
Year FE	Yes	Yes
Chow test		
Chi2	3.355*	
P-value	0.0670	

Notes: The table presents the results on the changes in CSR performance regarding the margin-trading and short-selling pilot program in firms with high bankruptcy risk and low bankruptcy risk. Bankruptcy risk is measured based on the $Z_{China}Score$, which is to identify financially distressed firms in China according to Zhang et al. (2010): $Z_{China}Score = 0.517\text{-}0.460X_6+9.320X_7+0.388X_8+1.158X_9$, where X_6 is the total liabilities/total assets, X_7 is the net profit/average total assets, X_8 is the working capital/total assets, and X_9 is the retained earnings/total assets. Firm years that have a $Z_{China}Score$ value greater than 0.9 (lower than 0.5) are classified as financially healthy (distressed), and firm years with a $Z_{China}Score$ value between 0.5 and 0.9 are classified as potentially distressed companies, and a close watch is required (Zhang et al., 2010). We classify firm-year observations with a $Z_{China}Score$ larger than 0.9 in the low bankruptcy risk subsample and firm-year observations with a $Z_{China}Score$ lower than 0.9 in the high bankruptcy risk subsample. The *z*-statistics reported in the parentheses are based on heteroscedasticity-robust standard errors clustered by firm. ∗, ∗∗,and ∗∗∗ indicate the statistical significance at the .10, .05, and .01 levels (two-sided), respectively. Appendix 2 contains the variable definitions.

Table 12

Effects of firm ownership on the relation between the margin-trading and short-selling pilot program and CSR performance: SOEs vs. non-SOEs

	SOE	non-SOE
	(1)	(2)
PILOT×DURING	**1.543*** **	**0.200**
	(2.666)	**(0.262)**
PILOT	-0.038	0.583
	(-0.039)	(0.569)
Control variables	Yes	Yes
Observations	2,156	1,252
Adjusted R^2	0.453	0.496
Industry FE	Yes	Yes
Year FE	Yes	Yes
Firm FE	No	No
Chow test		
Chi2	1.500*	
P-value	0.080	

Notes: The table presents the results on the changes in CSR performance regarding the margin-trading and short-selling pilot program for SOEs and non-SOEs. A firm is defined as an SOE if the ultimate controlling shareholder is a state government; otherwise, it is classified as a non-SOE. The *z*-statistics reported in parentheses are based on heteroscedasticity-robust standard errors clustered by firm. ∗, ∗∗, and ∗∗∗ indicate the statistical significance at the .10, .05, and .01 levels (two-sided), respectively. Appendix 2 contains the variable definitions.

Table 13

Effects of ownership concentration on the relation between the margin-trading and short-selling pilot program and CSR performance: high concentrated vs. low concentrated ownership

	High concentrated ownership	Low concentrated ownership
	(1)	(2)
PILOT×DURING	**1.797****	**0.064**
	(2.422)	**(0.105)**
PILOT	0.366	-0.331
	(0.386)	(-0.357)
Control variables	Yes	Yes
Observations	1,823	1,585
Adjusted R^2	0.439	0.449
Industry FE	Yes	Yes
Year FE	Yes	Yes
Chow test		
Chi2	9.256***	
P-value	0.002	

Notes: The table presents the results on the changes in CSR performance regarding the margin-trading and short-selling pilot program in the high concentrated ownership and low concentrated ownership groups. High concentrated ownership is defined as the top ten shareholders above (below) the industry median. The *z*-statistics are reported in the parentheses and are based on heteroscedasticity-robust standard errors clustered by firm. ∗∗∗, ∗∗, and ∗ indicate the statistical significance at the .01, .05, and .10 levels (two-sided), respectively. Appendix 2 contains the variable definitions.

Appendix 1

The timeline of CSRC pilot program

Effective Day	Announcement Day	Firms Added	Firms Deleted	Firms on List
03/31/2010	02/12/2010	90	0	90
Between 03/2010 and 11/2011		*6*	*6*	*90*
12/05/2011	11/25/2011	189	1	278
01/31/2013	01/25/2013	222	0	500
Between 01/2013 and 09/2013		0	6	494
09/16/2013	09/06/2013	206	0	700
Between 09/2013 and 09/2014		0	5	695
09/22/2014	09/12/2014	205	0	900

Notes: The table summarizes changes in the qualification list from the initial implementation of the pilot program (February 12, 2010) to the latest major revision (September 22, 2014) in China. The effective date refers to the date on which a designated stock can perform margin trading and/or short selling. The announcement date refers to the date on which the China Securities Regulatory Commission (CSRC) announced a change in the list of qualified stocks. We do not count ETF in the table (*source: http://www.sse.com.cn/market/othersdata/margin/sum/ and http://www.szse.cn/disclosure/margin/margin/index.html*).

Appendix 2

Variable Definition

Variable	Definition
Dependent Variables	
CSRscore	The overall CSR score of Chinese listed firms from RKS.
Δ*CSRscore*	The change in *CSRscore* at the end of fiscal year *t* Δ*CSRscore* = *CSRscore* (*t*) – *CSRscore* (*t*-1).
Experiment-related Variables	
PILOT	Dummy variable that equals 1 if the stock is designated as a pilot stock in the margin-trading and short-selling program and is 0 otherwise.
DURING	Dummy variable that equals 1 after the year a firm is selected as a pilot firm and is 0 otherwise (Wang et al., 2018).
POST	Dummy variable that equals 1 for the year a pilot firm is excluded from the pilot list and is 0 otherwise (Wang et al., 2018).
SHORT	The total remaining balance of a firm's short selling at the end of fiscal year *t*, standardized by the total market capitalization (Chen et al., 2017).
Δ*SHORT*	The net RMB value change of a firm's short sales at the end of fiscal year *t*, standardized by the total market capitalization (Chen et al., 2017) Δ*SHORT* = *SHORT*(*t*) – *SHORT*(*t*-1).
MARGIN	Total remaining balance of a firm's margin buying at the end of fiscal year *t*, standardized by the total market capitalization (Chen et al., 2017).
Δ*MARGIN*	The net RMB value change of a firm's margin buying at the end of fiscal year *t*, standardized by the total market capitalization (Chen et al., 2017) Δ*MARGIN* = *MARGIN*(*t*) – *MARGIN*(*t*-1).
Control Variables	
SIZE	Natural logarithm of total assets at the end of the fiscal year.
LEV	Ratio of total liability to total assets at the end of the fiscal year.
PPE	Ratio of cash paid to purchase and construct fixed assets, intangible assets, and other long-term assets to total assets.
ROA	Ratio of net income to total assets at the end of the fiscal year.
AGE	The difference between the current fiscal year and the first fiscal year when the firm was established.
GROWTH	The growth of total sales at the end of the fiscal year.
TOBINQ	Market-to-book ratio at the end of the fiscal year.
LIQUIDITY	Ratio of the total outstanding shares to the total shares at the end of the fiscal year.
CAPEX	Ratio of the total capital expenditure to the total assets at the end of the fiscal year.
ANALYST	Number of forecasting agencies for the fiscal year.
BIG4	Dummy variable is 1 for big 4 auditors and is 0 otherwise.
DUAL	Dummy variable is 1 if the CEO is also the chairman of a firm and is 0

	otherwise.
Other Variables	
SHORTINTEREST	The ratio of the shares in a short position to the total shares outstanding in the fiscal year multiplied by 1,000.
SHORTPRESS	Abnormal short sales, estimated as a firm's short-sales volume in a certain year minus the median level of annual short sales of all eligible firms. We multiple this number by 1,000,000.
GOODNEWS	Dummy variable is 1 if the ROA at the end of the fiscal year is below the industry median ROA and is 0 otherwise.
SOE	Dummy variable is 1 if the ultimate controlled shareholders are state governments and is 0 otherwise.
BANKRUPTCY	Ordered variable is 0 for firm-year observations with a $Z_{China}Score$ larger than 0.9 ($Z \geq 0.9$); 1 for firm-year observations with a $Z_{China}Score$ lower than 0.9 but larger than 0.5 ($0.5 \leq Z < 0.9$); and is 2 for firm-year observations with a $Z_{China}Score$ lower than 0.5 ($Z \leq 0.5$).
$Z_{China}Score$	Follow Zhang et al. (2010), to calculate the *Z*-Score for Chinese firms to identify financial distress: $Z_{China}Score = 0.517\text{-}0.460X_6+9.320X_7+0.388X_8+1.158X_9$, where X_6 is the total liabilities/total assets, X_7 is the net profit/average total assets, X_8 is the working capital/total assets, and X_9 is the retained earnings/total assets.
LARGESH	Dummy variable is 1 if the ownership of the top 10 shareholders are above the median ownership of the top 10 shareholders in that industry in the fiscal year and is 0 otherwise.

Appendix 3

Propensity Score Matching (PSM)

Panel A Logit model to calculate propensity scores

	LIST	*t-value*
	(1)	(2)
SIZE	1.7102***	(17.2025)
BM	-1.2393***	(-11.7132)
GOV	-0.4121	(-1.2226)
ROA	3.7186**	(2.3075)
TURNOVER	0.0000	(0.1271)
SM	0.0154	(0.1217)
Constant	-35.6795***	(-16.7776)
Observations	2,295	
Industry	Yes	
Year	Yes	
Pseudo R^2	0.395	

Panel B Balance test

	Unmatched			Matched		
	Treated	*Control*	*Diff.*	*Treated*	*Control*	*Diff.*
SIZE	21.994	22.867	-0.873***	22.281	22.181	0.099
BM	1.112	1.122	-0.011	1.202	1.182	0.020
GOV	0.076	0.143	-0.067***	0.112	0.110	0.003
ROA	0.042	0.058	-0.015***	0.047	0.050	-0.003
TURNOVER	605.051	501.285	103.766***	540.358	534.848	5.509
BM	0.517	0.638	-0.121***	0.626	0.632	-0.006

Sample	*Ps* R^2	*LR* chi^2	*P>*chi^2
Unmatched	0.205	629.71	0.000
Matched	0.004	5.58	0.472

Notes: The table reports the propensity score matching results. Panel A shows the results of the logit model to calculate the propensity score. Panels B shows the balance test of the PSM sample.