Before thrive, first survive: The impact of controlling shareholder pledging on corporate ESG performance

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Declaration of interest

None

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Abstract

This paper investigates the impact of controlling shareholder pledging (CSP) on corporate environmental, social, and governance (ESG) performance. Using data from Chinese listed firms, we show that CSP significantly weakens firms' ESG performance and that this effect is robust to endogeneity and the choice of ESG metrics and CSP measures. In addition, we show that the main channel through which ESG performance deteriorates for firms with CSP is the risk of losing control. The adverse impact of CSP on ESG is much less when control rights are not at risk. On the other hand, limited resources (e.g. tunnelling and financial constraints) contribute little to the impact. Our further analyses demonstrate that internal monitoring mechanisms can mitigate the negative impact of CSP on corporate ESG performance, but external monitoring mechanisms cannot.

1. Introduction

This paper investigates whether controlling shareholder pledging (CSP) affects corporate environmental, social, and governance (ESG) performance. Share pledging is widely used by controlling shareholders in emerging markets as a form of borrowing (Dou, Masulis, & Zein, 2019; Pang & Wang, 2020; He, Liu, & Zhu, 2022). However, margin provisions associated with the share pledge puts the controlling shareholder's control rights at risk because creditors can force the controlling shareholder to sell the shares if the margin requirement is not met. As control rights are valuable to controlling shareholders (Barclay & Holderness, 1989; La Porta, Lopez-de-Silanes, & Shleifer, 1999; Claessens, Djankov, Fan, & Lang, 2002; Dyck & Zingales, 2004), the behaviour of controlling shareholders who pledge their shares would revolve around the "survival" of their control rights.

With their control rights at risk, the priority of controlling shareholders is to avoid share price declines. The existing literature suggests that the risk of losing control from margin call pressure can induce short-sighted and opportunistic behaviours by controlling shareholders such as bypassing value-adding but risky projects (Dou et al., 2019), share repurchases (Chan, Chen, Hu, & Liu, 2018), decreased dividends payouts (Li, Zhou, & Yan, 2020), excessive risk aversion (Chou, Wang, & Yang, 2021), suboptimal investment decisions (He, Huang, & Zhou, 2023), earnings management (DeJong, Liao, & Xie, 2020), and mergers and acquisitions (Zhu, Xia, & Zheng, 2021). On the other hand, corporate ESG investments are sensitive to financial constraints (Hong, Kubik, & Scheinkman, 2012) and costly to firms both financially and organizationally (Wickert, Scherer, & Spence, 2016). Moreover, ESG activities do not necessarily increase stock prices (Krüger 2015; Capelle-Blancard & Petit 2019). Thus, we conjecture that the short-sightedness induced by margin call pressure is highly likely to discourage firms from engaging in ESG and therefore lead to poor ESG performance.

In this study, we empirically test the above conjecture. Our empirical analysis employs a sample of data on controlling shareholder pledges of Chinese listed A-share firms from 2010 to 2020. In China, where the banking system is primarily state-controlled, banking discrimination makes it difficult for entrepreneurs to get financed by conventional bank loans (Brandt & Li, 2003). Thus, CSP has become a widespread source of funding for many Chinese listed firms (Pang & Wang, 2020). As shown in section 2.2, 44.43% of the firms in our sample are associated with CSP during the sample period, and the proportion of firms with CSP increased sharply after the introduction of the centralized pledging system by the Shanghai Stock Exchange, the Shenzhen Stock Exchange, and the China Securities Depository and Clearing Corporation Limited in 2013.

Our baseline results show that CSP significantly reduces corporate ESG performance. This finding is robust to alternative measures of CSP and corporate ESG performance. We also use propensity score matching (PSM) and instrumental variable (IV) regression to address the potential endogeneity issues in our baseline analysis. The results support a causal relationship between CSP and corporate ESG performance.

We next explore two potential channels through which CSP affects corporate ESG performance. The first channel is the risk of losing control. Controlling shareholders have strong incentives to avoid loss of control because control rights provide them with private benefits (Barclay & Holderness, 1989; Dyck & Zingales, 2004). To test this channel, we measure the distance to margin call by the ratio of pledge value to loan value and create three dummies to indicate whether a margin call occurs, is likely to occur, or is unlikely to occur. Our results show that corporate ESG performance decreases much less when a margin call is unlikely to occur. In addition, we separate firms into high-pledging group and low-pledging group by the pledging ratio. The results show that the negative impact of CSP is more profound in the high-pledging group. Lastly, given that stock price responds negatively to negative ESG

2

news (Krüger, 2015; Li, Gong, Yan, Zhang, & Koh, 2018; Capelle-Blancard & Petit, 2019; Grewal, Riedl, & Serafeim, 2019; Wong & Zhang, 2022), we test whether firms decrease ESG disclosure when their controlling shareholders pledge shares, because controlling shareholders may hinder ESG disclosure to mitigate the downside risk of stock price if margin call is a concern. We use the Bloomberg ESG Disclosure Score to measure disclosure quality and find that CSP has a significantly negative impact on corporate ESG disclosure, and this impact is more pronounced for environmental and social disclosures.

The second channel is limited resources. The CSP itself signals that the controlling shareholder has limited resources to fund his/her entrepreneurship, either from the same listed firm or other private (sibling) firms under the control of the same controlling shareholder. With limited resources, the controlling shareholder has strong incentives to divert resources from ESG to other investments, as ESG investments are no longer part of the core business when facing an existential crisis. We employ a two-stage mediation effect model to test this channel. We consider two mediating variables. The first variable, tunnelling, measures the degree of the expropriation of firm resources by controlling shareholders (Barclay & Holderness, 1989; Shleifer & Vishny, 1997; Johnson, La Porta, Lopez-de-Silanes, & Shleifer, 2000). This accounts for the case that controlling shareholders use share pledging to fund their private firms. Second, we use financial constraints, measured by the KZ index (Kaplan & Zingales, 1997) to account for the case that controlling shareholders use share pledging to fund the public firm. Our results identify a mediating effect of both variables. However, the magnitude of the mediating effect is marginal.

We further investigate whether corporate monitoring mechanisms mitigate the negative impact of CSP on corporate ESG performance. Controlling shareholders enjoy private benefits from their control rights over listed firms by, for example, expropriation of firm resources at the costs of other shareholders (La Porta et al., 1999; Johnson et al., 2000; Albuquerue & Wang,

2008). That means, the impact of CSP on corporate ESG performance essentially arises from the principal-principal conflicts between the controlling shareholder and minority shareholders. As a result, we hypothesize that corporate monitoring mechanisms could address the principal-principal conflicts, and thus mitigate the impact of CSP on corporate ESG performance. To test this hypothesis, we consider both internal corporate monitors, including internal control quality and managerial ownership, and external corporate monitors, including independent directors, institutional shareholders, and media attention. Our results show that internal monitoring mechanisms mitigate the impact of CSP on corporate ESG performance, but external monitoring mechanisms do not.

This paper contributes to three strands of the literature. First, it contributes to the literature on share pledging. While share pledging provides an easier way for firms to obtain external debt financing, extant literature has identified many consequences associated with share pledging, including higher firm risk, higher stock crash risk, lower firm value, higher likelihood of earnings management, lower cash dividends, more share repurchases, greater risk averse in investment decisions, and higher probability to engage in mergers and acquisitions (e.g. Chan et al., 2018; DeJong et al., 2018; Dou et al., 2019; Wang & Chou, 2018; Anderson & Puleo, 2020; Pang & Wang, 2020; Chou et al., 2021; Zhou, Li, Yan, & Lyu, 2021; Zhu et al., 2021; Guo, Ke, & Tang, 2023). We show that CSP affects corporate ESG performance. The contribution of this finding to the literature is that pledges by controlling shareholders also have non-pecuniary consequences.

Second, our paper contributes to the literature on the relationship between insider characteristics and corporate ESG/CSR (corporate social responsibility) performance. [1] Previous studies find that insider characteristics, such as gender (Borghesi, Houston, & Naranjo,

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[1] See, Tsang, Frost, & Cao (2023) for a detailed literature review.

2014; McGuinness, Vieito, & Wang, 2017; Cronqvist & Yu, 2017), marital status (Hedge & Mishra, 2019), age (Borghesi et al., 2014), political leanings (Di Giuli & Kostoversky, 2014) and salary (Jian & Lee, 2015; Ikram, Li, & Minor, 2019) affect corporate ESG/CSR performance. We show that the behaviour of controlling shareholders also affects corporate ESG performance. In addition, many studies have linked ownership to corporate ESG/CSR performance (e.g. Gillan, Hartzell, Koch, & Starks, 2010; Fernando, Sharfman, & Uysal, 2017; Boubakri, Guedhami, Kowk, & Wang, 2019; Dyck, Lins, Roth, & Wagner, 2019; Chen, Dong, & Lin, 2020; Ho, Bai, Lu, & Qin, 2021; Hsu, Liang, & Matos, 2021). Consistent with these studies, we find that managerial ownership mitigates the negative impact of CSP on corporate ESG performance.

Third, our paper contributes to the literature on the role of corporate monitors in addressing principal-principal conflicts. Previous studies have documented massive evidence on the effects of various corporate monitoring mechanisms in addressing the Type II agency problem, i.e. the conflicts of interests between the controlling shareholder and minority shareholders (e.g. Dyck & Zingales, 2002, 2004; Fahlenbrach & Stulz, 2009; Elyasiani & Jia 2010; Li & Qian, 2013; Bebchuk & Hamdani 2017). Our contribution to this strand of literature is that, from the ESG perspective, internal monitoring mechanisms mitigate the agency problem, but external monitoring mechanisms do not.

Among the papers in the literature, our paper is related to Huang, Luo, Wang, and Xiao (2022) which also document a negative impact of CSP on corporate ESG performance in China. However, our paper differs from Huang et al. (2022) in the following ways. First, Huang et al. (2022) use the Syntao Green Finance ESG rating which covers the composite firms of the CSI300 index (from 2014) and the CSI500 index (from 2018). This leads to a selection bias

towards large firms. The bias leads to an underestimate of the use of CSP in China[2]. Moreover, given the positive relation between firm size and corporate ESG performance, their biased sample tend to underestimate the economic significance of the impact of CSP on corporate ESG performance[3]. Our sample addresses the bias by using the Huazheng ESG rating which has a broader coverage. Second, while Huang et al. (2022) shows that the impact of CSP on corporate ESG performance is more pronounced for firms with greater valuation uncertainty, we show that the impact presents only for firms with downside uncertainty, i.e. when the risk of losing corporate control presents. When control rights are not of concern, CSP has little impact on corporate ESG performance. Lastly, Huang et al. (2022) show that institutional ownership, as an external monitoring device, mitigates the negative impact of CSP on corporate ESG performance. We show that only internal monitors have the mitigating effect. The contrast results may be due to the sample bias in Huang et al. (2022)[4].

The rest of the paper is organized as follows. Section 2 describes the sample and measurement. Section 3 presents the main empirical analysis. Section 4 investigates the mechanism of the effect. Section 5 examines the heterogeneous effect. Section 6 concludes. The Appendix provides a table which describes the variables used in this study and their data sources, as well as a correlation matrix table.

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[2] A comparison of the summary statistics in Huang et al. (2022) with those in He et al. (2022) and our paper shows that the proportion of firms with CSP in Huang et al. (2022) is 10% lower than in He et al. (2022) and our paper.
[3] The coefficient of CSP dummy is -0.08 in Huang et al. (2022) and -0.29 using a similar regression model on our sample (results not reported but available on request).
[4] In their sample, large firms (those included in the CSI300 index) are likely to have more institutional ownership than small firms (those included in the CSI500 index), because of the investments from passive index funds (Pruitt & Wei, 1989). Therefore, their results cannot distinguish between the effect from firm size and the effect from institutional ownership.

2. Data, variables, and sample selection

2.1 Variable construction and baseline specification

To measure corporate ESG performance, we use the Huazheng ESG scores for Chinese A-share firms from iFind. The Huazheng ESG rating has the broadest coverage and is commonly used in the literature [5]. The Huazheng ESG rating framework assesses corporate ESG performance based on sixteen aspects including climate change, resource utilization, human resources, social contribution, shareholder interests, and business ethics etc[6]. It provides the corporate ESG score ranging from 0 to 100, and corresponding ESG grades from C to AAA. We use the ESG score as our main dependent variable as it provides more precise information on the changes in corporate ESG performance than the ESG grades.

In the robustness test, we also use the Huazheng ESG grades and alternative ESG rating scores from QuantData to ensure that our analysis is immune to the choice of performance measures. The Huazheng ESG grades range from AAA, AA, A, BBB, BB, B, CCC, CC, and C, where AAA indicates the best ESG performance and C indicates the worst ESG performance. We use a linear conversion process in which AAA ratings are assigned a value of 9 and C ratings are assigned a value of 1. The ESG rating framework of QuantData is different from that of Huazheng in some aspects. Thus, it helps mitigate potential biases, if any, induced by the choice of rating agency.

We collect data on share pledging deals and shareholding information from the China Stock Market & Accounting Research (CSMAR) Database. We define a firm's controlling

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[5] For example, see Chen and Xie (2022), Jiang, Wang, Li, and Wan (2022), and Fang, Nie, and Shen (2023) among others.
[6] Table A1 in the appendix provides a detailed description on the indicators used by Huazheng.

shareholder as the largest shareholder who holds at least 20% of ordinary shares of the firm[7].

We focus on the deals in which the pledgor is the controlling shareholder of the firm. Following

Chan et al. (2018), our main explanatory variable, *CSP* is the number of shares pledged scaled

by the total number of shares held by the controlling shareholder. In our empirical analysis, we

also use alternative explanatory variables to check the robustness of our empirical analysis.

We also include a set of control variables that may affect corporate ESG performance.

These variables include corporate ESG performance, including firm size (*Size*), firm leverage

(*LEV*), cash flows (*CF*), market-to-book equity ratio (*MB*), return on assets (*ROA*), percentage

of shares held by the controlling shareholder (*FSHR*). Data on these variables are obtained from

CSMAR.

We apply the ordinary least squares (OLS) framework to study the impact of CSP on

corporate ESG performance. The baseline specification is as follows:

$$ESG_{i,t+1} = \beta_0 + \beta_1 \times CSP_{i,t} + \sum \gamma \times Controls_{i,t} + y_t + w_t + \varepsilon_{i,t} \qquad (1)$$

In model (1), $ESG_{i,t+1}$ is the Huazheng ESG score for firm *i* in year *t+1*. The main

explanatory variable, $CSP_{i,t}$, is the number of shares pledged by the controlling shareholder

scaled by the total number of shares held by the controlling shareholder for firm *i* in year *t*.

$Controls_{i,t}$ are a series of firm-specific control variables, described above, for firm *i* in year *t*

that may affect corporate ESG performance. Furthermore, we control for year fixed effect y_t

and industry fixed effect w_t. We cluster standard errors at the firm level to address the potential

concern of within-firm correlations of the regression residuals. The average effect of CSP on

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[7] According to the China Securities Regulatory Commission, a controlling shareholder of a publicly listed company is: 1) the largest shareholder, or 2) the shareholder with more voting power than the largest shareholder, or 3) the shareholder who possesses 30% shares or voting rights of the company, or 4) the shareholder with voting power to appoint at least half of the board members. Similar identification is used in Xu and Huang (2021).

corporate ESG performance is captured by β_1.

2.2 Sample and descriptive statistics

Our initial includes all A-share firms listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange from 2010 to 2020. We exclude financial firms, "ST" (special treatment) firms, and firms with missing data. The final sample contains 3247 firms and 21,101 firm-year observations. Table 1 provides a sample distribution of firms with CSP by year. On average, 44.43% of the sample firms are associated with CSP during the entire sample period. Moreover, the proportion of firms with CSP kept increasing during the sample period, except for 2020 when the market was suffering shocks from the COVID-19. The results in Table 1 support the argument that CSP is a popular form of borrowing by Chinese entrepreneurs.

[Insert Table 1 about here]

Table 2 provides summary statistics of the variables used in our study. All continuous variables are winsorized at the 1st and 99th percentiles to limit the influence of outliers. Overall, the characteristics of our sample are consistent with recent studies related to corporate ESG performance and CSP in China (e.g. Pang & Wang 2020; Zhu et al., 2021; Jiang et al., 2022). A correlation matrix of the variables is presented in Table A3 in the appendix.

[Insert Table 2 about here]

3. The impact of CSP on corporate ESG performance

3.1 Baseline results

We begin our empirical analysis with the baseline regression denoted by Eq. 1. Table 3 reports the baseline regression results.

[Insert Table 3 about here]

In Table 3, column 1 reports the regression results without any controls and fixed effects, and column 2 reports the regression results with the full set of control variables and year, industry fixed effects. The results in this column show that the coefficient of CSP is negative and statistically significant at 1%, suggesting that corporate ESG performance significantly decreases when the controlling shareholder pledges his/her shares. We define alternative CSP variables to ensure that our results are neutral to the construction of the explanatory variable. In column 3, we define a dummy variable, $CSP\_DUM_{i,t}$, equal to one if the controlling shareholder of firm i pledges shares in year t, and zero otherwise. The results show that firms associated with CSP, on average, underperform those without by 1.45 ESG scores. In column 4, we define a dummy variable, $CSP\_DUM2_{i,t}$, equal to one if the pledging ratio of the controlling shareholder for firm i in year t is in the highest quartile within the industry and zero otherwise. The results show that firms with above-average CSP, on average, underperform those below average by 1.52 ESG scores. In column 5, we construct a dummy variable, $CSP\_DUM3_{i,t}$, equal to one if the pledging ratio of the controlling shareholder for firm i in year t is above the median of the industry and zero otherwise. The results show that firms with above-median CSP, on average, underperform those below median by 2.04 ESG scores. In column 6, we measure CSP as the number of shares pledged by the controlling shareholder scaled by the firm's total number of shares outstanding. Consistent with our baseline specification, the results show that CSP has a significant negative impact on corporate ESG performance. Consistent with extant studies (e.g. Pang & Wang 2020; Zhu et al., 2021; Jiang et al., 2022), the coefficients of control variables show that larger firms and more profitable firms are more likely to engage in ESG activities, but more levered firms are less likely to engage in ESG activities.

To summarize, our empirical results show that pledging by controlling shareholders leads to a statistically significant and economically meaningful negative impact on corporate

ESG performance.

3.2 Endogeneity of CSP and corporate ESG performance

The baseline results support our hypothesis that CSP significantly deteriorates corporate ESG performance. However, a possible concern with our baseline specification is that the decision of share pledging by the controlling shareholder could be endogenous with corporate ESG performance through financial constraints. For instance, Zhao and Xiao (2019) document a negative impact of corporate CSR engagement on the firm's financial constraint. Cheng, Liu, and Sun (2021) show that financially constrained firms are more likely to use insider share pledging as an alternative funding source and that CSP can mitigate the financial constraints of the focal firm. Thus, it could be the case that, while CSP affects corporate ESG performance, firms with poor ESG performance face high financial constraints and demand share pledging made by the controlling shareholder to relieve the financial constraints. In this subsection, we address the potential endogeneity of CSP and corporate ESG performance using the propensity score matching (PSM) and the instrument variable (IV) approaches.

First, we use the PSM approach that mitigates the potential impact of differences in firm characteristics on the regression results. We match each firm-year observation with CSP (treatment group) with a firm-year observation without CSP (control group) in the same year by a set of firm characteristics including Size, LEV, CF, MB, ROA, FSHR, and industry. This procedure forms a matched sample in which the treatment group share is similar to the control group in many aspects other than the treatment (i.e. controlling shareholder pledging). The matched sample contains 15,368 firm-year observations. Table A4 in the appendix shows that the differences in firm characteristics between the treatment group and control group significantly reduce after the matching.

We repeat our baseline regression using the matched sample in Table 4 column 1 where

the main explanatory variable is *CSP* and column 2 where the main explanatory variable is

CSP_DUM. The results show that the ESG score of a firm with CSP significantly reduces. The

results using the PSM approach are similar to those in the baseline regression both in the

magnitude and the level of statistical significance. Thus, the PSM results support the conclusion

drawn from the baseline results.

[Insert Table 4 about here]

Then, we use the IV approach to mitigate the potential endogeneity arising from the

omitted variable bias. We use two instrumental variables. The first is the average pledging ratio

of the industry where firm i headquarters in year t ($CSP\_IND_{i,t}$). The second is the average

pledging ratio of the province of firm i in year t ($CSP\_PRO_{i,t}$). Both instrumental variables are

correlated to CSP, but unlikely to affect the corporate ESG performance of individual firms.

We report the results of the IV regressions in columns 3-8 in Table 4. In columns 3 and 4, we

report the results where the instrument is *CSP_IND*. The first-stage results in column 3 show

that CSP is significantly and positively correlated to the instrument. The second-stage results

in column 4 confirm our baseline results that CSP significantly reduces corporate ESG

performance. In columns 5 and 6, we report the results where the instrument is *CSP_PRO*. The

first-stage results document the positive correlation between CSP and the instrument. The

negative impact of CSP on corporate ESG performance is identified in the second-stage results.

In columns 7 and 8, we run the two-stage IV regression where we include both instruments.

The results are still similar to previous results.

To sum up, the endogeneity tests in this subsection establish the causal relationship

between CSP and corporate ESG performance.

3.3 Alternative ESG performance measures

In this subsection, we address the potential impact of the choice of corporate ESG performance

measure on the robustness of our empirical analysis. According to the Huazheng ESG rating framework, the behaviour of the controlling shareholder is incorporated into the assessment of corporate governance performance. Thus, a potential bias is that our previous results are driven by the deduction in governance score solely due to the pledging behaviour of the controlling shareholder, rather than through the channels that we will be investigating later.

We address this issue by using alternative ESG performance measures. Apart from the overall ESG score, Huazheng reports the scores on environmental, social, and governance respectively. Thus, we investigate the impact of CSP on corporate environmental performance (*E*), social performance (*S*), and governance performance (G), respectively. The results are reported in columns 1 to 3 of Table 5. Consistent with previous analysis based on aggregate ESG performance, the coefficients of CSP in regressions with individual E (column 1), S (column 2), and G performance (column 3) are all significantly negative.

[Insert Table 5 about here]

In addition, we substitute the ESG performance score in our baseline specification with the Huazheng ESG grade. Using this substitution, we mitigate at least part of the potential bias because the pledging behaviour of the controlling shareholder alone is unlikely to incur a downgrade for the overall corporate ESG performance. We report the results in column 4 of Table 5. The coefficient on *PLD* is negative and statistically significant at 1%. This supports our findings from the baseline specification that CSP causes a decrease in corporate ESG performance.

In the last column of Table 5, we use the corporate ESG scores from QuantData as an alternative ESG performance measure. QuantData is another rating agency in China that

specializes in ESG evaluation. Given the differences in the rating framework[8] between the agencies, we can mitigate not only the impact of the pledging behaviour of the controlling shareholder on the governance score but also potential misspecification, if any, inherent in a particular rating framework (Ahmed, Gao, & Satchell, 2021). The coefficient on *PLD* is -2.38 and statistically significant at 1%. The result is quantitatively and qualitatively similar to the conclusion drawn from our baseline specification.

4 Mechanism investigation

Corporate ESG activities aim to achieve value creation in the long run which requires investments over time. However, CSP is likely to result in deviation from the long-run horizon for two reasons. First, the threat of loss of control forces the controlling shareholder to focus on short-term financial performance at the expense of long-term value creation. Second, CSP is associated with financial constraints which in turn reduces a firm's ability to meet its ESG commitments. Second, the threat of loss of control forces the controlling shareholder to focus on short-term financial performance at the expense of long-term value creation. In this section, we explore the two possible channels through which CSP affects corporate ESG performance.

4.1 The threat of losing control

First, we investigate the threat of losing control. The pledgor receives a margin call when the price of the pledged shares decreases. If the pledgor cannot maintain the margin requirement (e.g. by collateralizing more shares or depositing cash), the pledgee can force the pledgor to sell the shares, which results in loss of control when the pledgor is the controlling shareholder. Given the valuable private benefits of control (Barclay & Holderness, 1989; Dyck & Zingales,

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[8] Quantdata does not explicitly state that the behaviour of the controlling shareholder is assessed under its rating framework. Its assessment criteria regarding shareholders considers share concentration, stock trading by shareholders, and payout policy. On the other hand, Huazheng evaluates the behaviour of the controlling shareholder under its "governance risk" criteria which also includes debt serviceability, lawsuits, and taxation appearance.

2004), controlling shareholders have strong incentives to avoid loss of control and thus induce short-sighted corporate behaviours like avoiding risky but value-adding projects (Chou et al., 2021; Dou et al., 2019). As ESG activities do not necessarily increase stock prices (Krüger 2015; Capelle-Blancard & Petit 2019), we conjecture that the short-sightedness induced by the margin call pressure could hinder corporate engagements in ESG, leading to poor ESG performance.

To validate the channel, we first investigate the impact of margin call pressure on corporate ESG performance. We calculate the value-to-loan ratio which is the ratio of pledge value (the value of shares pledged at the end of the year) to loan value. We define three dummies to measure margin call pressure (MCP), including *High_MCP* which takes one if this ratio is less than 140%, and zero otherwise; *Moderate_MCP* which takes one if this ratio is between 140% and 160%, and zero otherwise; and *Low_MCP* which takes one if this ratio is above 160%. The 140% threshold corresponds to a maintenance ratio below which a margin call is triggered, and the 160% threshold corresponds to a precaution level under which a margin call is likely to happen[9]. In Table 6, we investigate the impact of margin call pressure on corporate ESG performance by including *High_MCP* (column 1), *Moderate_MCP* (column 3), *Low_MCP* (column 3), and their interactions with CSP in our baseline specification. In column 1, the coefficient on *High_MCP* is significantly negative, which suggests that corporate ESG performance is significantly impaired when a margin call occurs. In column 2, the coefficients on *Moderate_MCP* and its interaction with *CSP* are statistically insignificant. In column 3, the coefficients on *Low_MCP* and its interaction with *CSP* are significantly negative. The results imply that CSP affects corporate ESG performance much less in the absence of margin call pressure. The result is consistent with Chan et al. (2018) that share pledging matters

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[9] These levels are typically used in practice by Chinese pledging loan providers according to Haitong Securities, a leading brokerage firm in China. See https://www.htsec.com/jfimg/colimg/upload/20170531/7544149619 7258173.pdf

in corporate decisions because control rights are at risk.

[Insert Table 6 about here]

Second, control rights would not be a concern if only a small fraction of shares owned by the controlling shareholder is pledged (Chan et al., 2018). Therefore, the pledging ratio also measures the threat of losing control. In this regard, we further investigate whether the impact of CSP on corporate ESG performance varies across pledging ratio groups. In the first two columns of Table 7, we divide our sample into *low pledging* if the controlling shareholder's pledging ratio is below the average ratio in the same industry, and *high pledging* if it is above the industry average pledging ratio. For the *low pledging* group (column 1), the coefficient on *CSP* is no longer significant. However, for the *high pledging* group (column 2), the coefficient on *CSP* is significant and higher than the baseline estimation. The difference in the coefficients between the two groups (*High-Low*) is negative and significant at 1% using the Chow test. In the next two columns, we divided our sample by industry median pledging ratio. For the *low pledging* group (column 3), the coefficient on *CSP* is negative and statistically significant, but less in magnitude than that in the baseline regression and that from the *high pledging* group (column 4). The difference in the coefficients between the two groups (*High-Low*) is negative and significant at 1% using the Chow test. The results in this table show that the negative impact of CSP on corporate ESG performance is substantially more pronounced in firms with higher pledging ratios. This indicates that the threat of losing control is a major channel of the adverse impact of CSP on corporate ESG performance.

[Insert Table 7 about here]

Previous studies document opportunistic behaviours that support share price to circumvent the loss of control when controlling shareholders pledge their shares, such as bypassing value-adding but risky projects (Dou et al., 2019), share repurchases (Chan et al.,

16

2018), earnings management (DeJong et al., 2020), and mergers and acquisitions (Zhu et al., 2021). In addition, many studies show that stock price responds negatively to negative ESG news (e.g. Krüger 2015; Capelle-Blancard & Petit 2019; Grewal et al., 2019; Serafeim & Yoon, 2022). We conjecture that firms with CSP may opportunistically obfuscate ESG disclosure to mitigate the adverse impact of deteriorating ESG performance on stock price. Using Bloomberg ESG disclosure scores, we investigate the impact of CSP on corporate overall ESG disclosure quality (*ESG_Q*), as well as the disclosure quality on environmental (*E_Q*), social (*S_Q*), and governance (*G_Q*), respectively. We present the results in Table 8 where we run regressions of the disclosure quality variables on *CSP*. The results show that CSP have a significant negative impact on corporate ESG disclosure quality (column 1), and the impact is more pronounced in environmental disclosure (column 2) and social disclosure (column 3) than in governance disclosure (column 4). The findings imply a reputation view that firms decrease environmental and social disclosure to hide the negative impact of "doing bad" on share prices.

[Insert Table 8 about here]

4.2 Tunnelling and financial constraints

From the agency view, controlling shareholders enjoy significant private benefits of control compared to their cash flow rights, one of which is tunnelling which refers to the expropriation of firm resources by controlling shareholders (Barclay & Holderness, 1989; Shleifer & Vishny, 1997; Johnson et al., 2000). Within the institutional settings in China, controlling shareholders preserve their control rights but forgo their cash flow rights when their shares are pledged, which exacerbates the separation of control rights and cash flow rights and thus increases the value of private benefits of control (Zhu et al., 2021). Thus, share pledging is likely to incentivize the controlling shareholder to divert sources out of the firm (Liu & Tian, 2012), leaving the firm with insufficient resources to support ESG activities. In addition, from the

17

signalling view, share pledging is often motivated by the financial constraints of either the firm itself (Cheng et al., 2021; Shi, Li, & Liu, 2023) or sibling firms controlled by the same controlling shareholder (Guo et al., 2023). A direct effect of the signal is that firms with CSP are difficult to source external funding and thus are forced to bypass attractive investment opportunities (Campello, Graham, & Harvey, 2010). Taking these views together, we conjecture that CSP affects corporate ESG performance through tunnelling and financial constraints.

To test this conjecture, we use the two-stage mediation effect model given by Eq. 2 and Eq. 3 as follows:

$$Mediation_{i,t} = \beta_0 + \beta_1 \times CSP_{i,t} + \sum \gamma \times Controls_{i,t} + y_t + w_t + \varepsilon_{i,t} \qquad (2)$$

$$ESG_{i,t+1} = \gamma_0 + \gamma_1 \times CSP_{i,t} + Mediation_{i,t} + \sum \gamma \times Controls_{i,t} + y_t + w_t + \varepsilon_{i,t} \qquad (3)$$

In Eq. 2, *Mediation* refers to a mediating variable, i.e. *Tunnel* or *FC*. *Tunnel* measures the degree of a firm's tunnelling. Following Jiang, Lee, and Yue (2010), we measure the degree of tunnelling as the ratio of other receivables to total assets. *FC* measures the level of a firm's financial constraints. We use the KZ index proposed by Kaplan and Zingales (1997) for this measure. In the first stage, Eq. 2 examines the impact of CSP on the mediating variable given by β_1. In the second stage, Eq. 3 adds the mediating variable to the baseline specification. The mediating effect is identified when the coefficient on *CSP* (γ_1) becomes insignificant or less in magnitude than estimated from the baseline regression and the mediation effect coefficient ($\gamma_1 \times \beta_1$) is statistically significant. We use the Sobel (1982) test to check the statistical significance of the mediating effect. We report the results in Table 6. In Panel A, column 1 presents the first-stage regression results (Eq. 2) where the mediating variable is *Tunnel*. The coefficient is positive and significant at 1%. Therefore, CSP increases the degree of tunnelling. Column 2 reports the second-stage regression results for the tunnelling channel. The coefficient

on *CSP* is less in magnitude than that in the baseline regression. In addition, the coefficient on *Tunnel* is negative and significant at 1%. The Sobel Z-statistic is -3.17, supporting a mediating effect of *Tunnel* in the impact of CSP on corporate ESG performance. In column 3, we report the first-stage regression results where the mediating variable is *FC*. The coefficient is positive and significant at 1%, suggesting that CSP increases corporate financial constraints. The second-stage regression results for the financial constraint channel in column 4 show that the coefficient on *CSP* is less in magnitude than that in the baseline regression. In addition, the coefficient on *FC* is negative and significant at 1%. The Sobel Z-statistic is -3.07, supporting a mediating effect of financial constraint in the impact of CSP on corporate ESG performance.

In panel B, we use the bootstrap method from MacKinnon, Lockwood, and Williams (2004) to check the robustness of the mediating effects given the concerns about the normality assumption in the Sobel method (Cheung, 2016). For the tunnelling channel, the results show that the indirect effect of *Tunnel* is -0.07 and its 95% confidence interval is between -0.09 and -0.04. For the financial constraint channel, the results show that the indirect effect of FC is -0.04 and its 95% confidence interval is between -0.06 and -0.02. The results in panel B are consistent with the conclusions drawn from panel A.

However, compared to the total effect (the coefficient of -3.03 in the baseline regression), the mediation effects of tunnelling (-0.07) and financial constraints (-0.04) are too small in magnitude. Therefore, both mediation effects are statistically significant but economically insignificant. In summary, our analysis in Table 6 finds that the impact of CSP on corporate ESG performance is marginally achieved by limiting the resources for ESG activities.

[Insert Table 9 about here]

5. The role of corporate monitoring

Our previous results establish a causal relationship between CSP and corporate ESG performance, and this relationship is primarily driven by controlling shareholders seeking to retain their control rights. Given that private benefits of control represent the principal-principal conflicts between the controlling shareholder and minority shareholders (La Porta et al., 1999; Albuquerue & Wang, 2008), we further explore whether corporate monitoring mechanisms can mitigate the negative impact of CSP on corporate ESG performance in this section.

First, we investigate the moderating effect of two internal monitoring mechanisms, internal control and management shareholding, on the negative impact of CSP on corporate ESG performance. To test whether internal control moderates the negative impact of CSP on corporate ESG performance, we use the internal control index developed by Shenzhen DIB Enterprise Risk Management Technology. The DIB internal control index measures the quality of internal control based on corporate internal control disclosure, internal control assessment, and auditing reports. We define *High_IC* which takes the value of 1 if the firm's internal control is in the highest quartile, and 0 otherwise[10]. In column 1 of Table 5, we repeat the baseline regression with *High_IC* and its interaction with *CSP*. The results show that the coefficient on the interaction term is significantly positive, confirming that better internal control mitigates the impact of shareholder pledging on corporate ESG performance. This finding is in line with the view that internal control is an important internal monitoring mechanism that reduces agency problems (Fama & Jensen, 1983; Jensen, 1993).

To test whether management shareholding moderates the negative impact of CSP on corporate ESG performance, we define *High_Mshare* which takes the value of 1 if the firm's management shareholding is in the highest quartile, and 0 otherwise. In column 2 of Table 5,

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[10] The results in this section do not qualitatively change when we use different cut-offs (e.g. median and average) to divide the monitoring levels. Results using alternative cut-offs are unreported but available upon request.

we repeat the baseline regression with *High_Mshare* and its interaction with *CSP*. The results show that the coefficient on the interaction term is significantly positive. The results suggest that management shareholding helps mitigate the negative impact of CSP on corporate ESG performance. A possible explanation is that, while in a typical principal-principal conflict managers represent controlling shareholders (Li & Qian, 2013), managerial ownership bonds the managers to the interests of minority shareholders (Fahlenbrach & Stulz, 2009) so that managers may act against the controlling shareholder and retain some resources in value-creation ESG projects (Welch & Yoon, 2022).

[Insert Table 10 about here]

Second, we investigate the moderating effect of three external monitoring mechanisms, media attention, independent shareholders, and institutional shareholders on the negative impact of CSP on corporate ESG performance. To test whether media attention alleviates the impact of CSP on corporate ESG performance, we collect data on the number of times that a firm appears in financial news in a given year from CNRDS. We construct a variable, *High_Media*, that takes the value of 1 if the number of times the firm appearing in financial news is in the highest quartile, and 0 otherwise. In column 3 of Table 5, we re-estimate the baseline regression with *High_Media* and its interaction with *CSP*. The results show that the coefficient on the interaction term is insignificant, which indicates that greater median attention does not mitigate the impact of CSP on corporate ESG. This finding is consistent with the literature that although media attention helps shape controlling shareholder behaviour and curb the private benefits of control (Dyck & Zingales, 2002, 2004), it is less effective in prompting positive changes for outside shareholders (Johnson, Ellstrand, Dalton, & Dalton, 2005; Core, Guay, & Larcker, 2008).

To test whether independent shareholders mitigate the impact of CSP on corporate ESG

performance, we construct a variable, *High_Indep*, that takes the value of 1 if the firm's fraction of independent directors on the board is in the highest quartile, and 0 otherwise. In column 4 of Table 5, we run the baseline regression with *High_Indep* and its interaction with *CSP*. The results show that the coefficient on the interaction term is insignificant, which indicates that board independence does not mitigate the impact of CSP on corporate ESG. This is not surprising because previous studies have questioned the independence of independent directors when corporate ownership is concentrated (e.g. Denis & Sarin, 1999; Dahya, Dimitrov, & McConnell, 2008; Jameson, Prevost, & Puthenpurackal, 2014; Li, Lu, Mittoo, & Zhang, 2015). In terms of principal-principal conflicts, Bebchuk and Hamdani (2017) argue that independent directors have insufficient incentives to stand for outside investors because their appointments depend on controlling shareholders.

To test whether institutional shareholders mitigate the impact of CSP on corporate ESG performance, we construct a variable, *High_Inst*, that takes the value of 1 if the fraction of shares held by institutional investors of the firm is in the highest quartile, and 0 otherwise. In column 5 of Table 5, we run the baseline regression with *High_Inst* and its interaction with *CSP*. The results show that the coefficient on the interaction term is negative and statistically significant. The results indicate that the presence of institutional shareholders exacerbates the adverse impact of CSP on corporate ESG. This finding is consistent with the exploitation scenario in Elyasiani and Jia (2010), which argue that some institutional investors side with insiders to expropriate the benefits of minority shareholders if doing so provides them with other benefits.

6. Conclusion

Controlling shareholders enjoy private benefits of control because their control rights exceed their cashflow rights. The private benefits of control represent great incentives for controlling

shareholders to retain control over public firms. When controlling shareholders use their shares as collateral to borrow, their control rights are at risk because they may be forced to sell the shares by the creditor if a margin call arises in the event of stock price crash. Thus, controlling shareholders who pledge have strong incentives to support the stock price by taking opportunistic behaviours such as share repurchases, dividend cuts, earnings management, and investments in low-risk projects. As ESG seems a costly endeavour with no clear payoff and only a marginal impact on stock performance in the short term, controlling shareholders who pledge their shares are likely to divert resources away from ESG investments, leading to poor ESG performance. However, little empirical evidence has been documented on how CSP affects corporate ESG performance.

In this study, we use data on share pledges of Chinese A-share listed firms to investigate the impact of CSP on corporate ESG performance. We show that corporate ESG performance significantly decreases after the controlling shareholder pledges and that this effect is robust to alternative measures of CSP and corporate ESG performance. We conduct PSM and IV approaches to address the endogeneity issue, and the results suggest that the effect of CSP on corporate ESG performance is likely causal. Moreover, we find that the effect is more pronounced for firms with more shares pledged by controlling shareholders and that corporate ESG performance deteriorates much more when share price declines lead to possible margin calls. In contrast, we show that tunnelling and financial constraints have little mediation role in the impact of CSP on corporate ESG performance. These results support our conjecture that CSP affects corporate ESG performance primarily through the risk of losing control. Finally, we show that internal corporate monitors such as internal control and managerial ownership mitigate the negative impact of CSP on corporate ESG performance, but external monitors such as independent directors, institutional shareholders, and media attention have little mitigating effect.

23

Our study suggests that the risk of losing control induces controlling shareholders to divert resources away from ESG investments. The empirical findings contribute to the growing literature on how share pledging affects corporate investment decisions and how insider characteristics affect corporate ESG/CSR performance. Our findings also have implications for the effectiveness of corporate monitoring mechanisms in addressing the principal-principal conflicts between the controlling shareholder and minority shareholders.

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Table 1 Sample distribution

This table reports the distribution of firms with controlling shareholder pledging (CSP). For each year during the sample period, we count the total number of firms, the number of firms with CSP, and calculate the percentage of firms with CSP.

	Number of observations	Number of observations with CSP	Percentage of observations with CSP
2010	1,152	345	29.95%
2011	1,438	456	31.71%
2012	1,717	567	33.02%
2013	1,812	678	37.42%
2014	1,735	728	41.96%
2015	1,787	856	47.90%
2016	1,946	1,000	51.39%
2017	2,115	1,153	54.52%
2018	2,517	1,317	52.32%
2019	2,420	1,200	49.59%
2020	2,462	1,074	43.62%
Total	21,101	9,376	44.43%

Table 2 Descriptive statistics

This table reports descriptive statistics of our sample. The sample consists of 3,247 firms and 21,101 firm-year observations during the period from 2010 to 2020. A detailed description of the variables is presented in Table A2 in the appendix. Continuous variables are winsorized at the 1st and 99th percentiles. We report the numbers of observations, means, standard deviations, 1st percentiles, 25th percentiles, median, 75th percentiles, and 99th percentiles for the variables used in our study.

	N	Mean	Standard Deviation	Percentiles				
				1%	25%	50%	75%	99%
ESG	21,101	73.11	5.10	58.24	70.00	73.34	76.63	84.11
ESG2	21,101	4.12	1.04	1.25	3.50	4.00	5.00	6.25
ESG3	16,794	52.75	7.55	39.78	47.18	51.47	57.19	74.71
ESG_DQ	7,741	21.10	7.21	9.09	16.53	20.25	23.55	45.04
CSP	21,101	0.24	0.34	0.00	0.00	0.00	0.48	1.00
CSP_DUM	21,101	0.44	0.50	0.00	0.00	0.00	1.00	1.00
Size	21,101	22.26	1.32	19.98	21.31	22.06	23.01	26.29
ROA	21,101	0.05	0.05	-0.14	0.02	0.04	0.07	0.21
MB	21,101	1.08	1.17	0.10	0.40	0.69	1.27	7.03
LEV	21,101	0.43	0.21	0.05	0.27	0.43	0.59	0.88
CF	21,101	0.05	0.07	-0.16	0.01	0.05	0.09	0.24
FSHR	21,101	0.39	0.13	0.20	0.28	0.36	0.48	0.75

Table 3 The effect of CSP on corporate ESG performance
This table presents the results of the baseline regressions that regress corporate ESG performance on controlling shareholder pledging (CSP), where *CSP* is the ratio of the controlling shareholder's shares pledged. Column 1 presents the regression without any control variables and any fixed effects. Column 2 presents the regression with controls and year, industry fixed effects. Column 3 presents the regression in which the main explanatory variable is a dummy *CSP_DUM* that takes 1 if the controlling shareholder pledges, and 0 otherwise. Column 4 presents the regression in which the main explanatory variable is a dummy *CSP_DUM2* which takes 1 if the controlling shareholder's pledging ratio is above the 75th percentile within the industry, and 0 otherwise. Column 5 presents the regression in which the main explanatory variable is a dummy *CSP_DUM3* which takes 1 if the controlling shareholder's pledging ratio is above median of the industry, and 0 otherwise. Column 6 presents the regression in which the main explanatory variable *CSP2* is the number of shares pledged by the controlling shareholder scaled by the firm's total number of shares outstanding. Robust standard errors are clustered at the firm level, and t statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) ESG_{t+1}	(2) ESG_{t+1}	(3) ESG_{t+1}	(4) ESG_{t+1}	(5) ESG_{t+1}	(6) ESG_{t+1}
CSP_t	-3.76***	-3.03***				
	(-18.32)	(-16.17)				
CSP_DUM_t			-1.45***			
			(-11.74)			
CSP_DUM2_t				-1.52***		
				(-12.41)		
CSP_DUM3_t					-2.04***	
					(-15.16)	
$CSP2_t$						-8.02***
						(-15.91)
$Size_t$		1.26***	1.26***	1.27***	1.28***	1.23***
		(17.61)	(17.25)	(17.36)	(17.76)	(17.16)
ROA_t		19.36***	20.76***	20.49***	19.52***	19.76***
		(17.31)	(18.26)	(18.03)	(17.34)	(17.67)
MB_t		0.05	0.08	0.07	0.07	0.07
		(0.61)	(0.95)	(0.93)	(0.84)	(0.86)
LEV_t		-3.40***	-3.65***	-3.63***	-3.64***	-3.35***
		(-8.23)	(-8.77)	(-8.72)	(-8.82)	(-8.11)
CF_t		-0.44	-0.29	-0.34	-0.30	-0.51
		(-0.65)	(-0.43)	(-0.49)	(-0.44)	(-0.75)
$FSHR_t$		-0.44	0.10	0.03	-0.20	1.13**
		(-0.87)	(0.20)	(0.05)	(-0.39)	(2.25)
Constant	74.023***	46.567***	46.138***	46.102***	46.032***	46.490***
	(791.25)	(32.06)	(30.97)	(31.05)	(31.44)	(32.00)
Year FE	NO	YES	YES	YES	YES	YES
Industry FE	NO	YES	YES	YES	YES	YES
Observations	21,101	21,101	21,101	21,101	21,101	21,101
Adjusted R-squared	0.062	0.233	0.215	0.216	0.224	0.231

Table 4 Endogeneity tests

This table presents the results of the endogeneity tests of the impact of controlling shareholder pledging (CSP) on corporate ESG performance. We address potential endogeneity using propensity score matching (PSM) and instrumental variable (IV) analysis. We construct PSM-matched sample based on the control variables in which the treated group consists of firms whose controlling shareholder pledges. Column 1 reports the regression results where the main explanatory variable is *CSP* (the ratio of the controlling shareholder's shares pledged) based on the PSM-matched sample. Column 2 reports the regression results where the main explanatory variable is *CSP_DUM* (which takes 1 if the controlling shareholder pledges, and 0 otherwise) based on the PSM-matched sample. For the IV analysis, we use two instruments, the average pledging ratio of the industry (*CSP_IND*) and the average pledging ratio of the province (*CSP_PRO*). Column 3 (first stage) and column 4 (second stage) report the IV regression results where the instrument is *CSP_IND*. Column 5 (first stage) and column 6 (second stage) report the IV regression results where the instrument is *CSP_PRO*. Column 7 (first stage) and column 8 (second stage) report the IV regression results where the instruments are *CSP_IND* and *CSP_PRO*. Robust standard errors are clustered at the firm level, and t statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	PSM		First stage	Second stage	First stage	Second stage	First stage	Second stage
			IV					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ESG_{t+1}	ESG_{t+1}	CSP_t	ESG_{t+1}	CSP_t	ESG_{t+1}	CSP_t	ESG_{t+1}
CSP_t	-2.89***			-2.95**		-3.59***		-3.49***
	(-14.67)			(-2.30)		(-3.54)		(-3.95)
CSP_DUM_t		-1.43***						
		(-11.07)						
CSP_IND $_t$			0.83***				0.80***	
			(9.68)				(9.47)	
CSP_PRO $_t$					0.93***		0.93***	
					(13.61)		(13.57)	
$Size_t$	1.28***	1.29***	-0.02***	1.26***	-0.02***	1.24***	-0.02***	1.24***
	(15.89)	(15.59)	(-4.54)	(16.62)	(-3.70)	(16.60)	(-3.72)	(16.88)
ROA_t	19.39***	20.67***	-0.44***	19.39***	-0.46***	19.11***	-0.45***	19.15***
	(15.29)	(16.06)	(-5.64)	(15.43)	(-6.04)	(15.64)	(-5.90)	(15.98)
MB_t	-0.07	-0.06	-0.02***	0.05	-0.03***	0.03	-0.02***	0.03

	(-0.80)	(-0.66)	(-3.98)	(0.57)	(-4.85)	(0.39)	(-4.31)	(0.43)
LEV_t	-2.99***	-3.17***	0.27***	-3.42***	0.26***	-3.24***	0.25***	-3.27***
	(-6.46)	(-6.80)	(8.67)	(-6.26)	(8.73)	(-6.46)	(8.46)	(-6.79)
CF_t	-0.38	-0.31	-0.20***	-0.42	-0.22***	-0.55	-0.22***	-0.53
	(-0.49)	(-0.40)	(-3.83)	(-0.58)	(-4.41)	(-0.79)	(-4.31)	(-0.77)
$FSHR_t$	-0.50	0.05	-0.34***	-0.41	-0.33***	-0.63	-0.32***	-0.60
	(-0.92)	(0.09)	(-9.43)	(-0.62)	(-9.22)	(-1.06)	(-9.17)	(-1.04)
Constant	44.98***	44.55***	0.59***	45.42***	0.48***	45.90***	0.35***	45.82***
	(25.66)	(24.86)	(5.72)	(25.76)	(4.63)	(26.70)	(3.32)	(27.43)
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	15,368	15,368	21,101	21,101	21,101	21,101	21,101	21,101
Adjusted R-squared	0.20	0.18	0.11	0.23	0.14	0.23	0.14	0.23

Table 5 Alternative corporate ESG performance measures
This table presents the results of regressions of the effect of controlling shareholder pledging (CSP) on corporate ESG performance with alternative corporate ESG performance measures. Column 1 presents the regression where the dependent variable is Huazheng corporate environmental (E) score. Column 2 presents the regression where the dependent variable is Huazheng corporate social (S) score. Column 3 presents the regression where the dependent variable is Huazheng corporate governance (G) score. Column 4 presents the regression where the dependent variable is Huazheng corporate ESG grade, in which AAA (highest) rating is assigned a value of 9 and C (lowest) rating is assigned a value of 1. Column 5 presents the regression where the dependent variable is corporate ESG score assessed by QuantData. Robust standard errors are clustered at the firm level, and t statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) E_{t+1}	(2) S_{t+1}	(3) G_{t+1}	(4) $ESG2_{t+1}$	(5) $ESG3_{t+1}$
CSP_t	-0.62**	-0.34*	-5.95***	-0.61***	-2.58***
	(-2.04)	(-1.87)	(-28.48)	(-16.18)	(-11.55)
$Size_t$	1.85***	1.62***	0.72***	0.25***	3.09***
	(16.32)	(23.22)	(9.56)	(17.64)	(31.74)
ROA_t	-0.27	30.18***	22.05***	3.90***	4.00***
	(-0.16)	(21.33)	(17.02)	(17.26)	(2.99)
MB_t	-0.25**	-0.53***	0.52***	0.01	-0.51***
	(-2.22)	(-6.66)	(6.34)	(0.38)	(-4.86)
LEV_t	1.92***	0.57	-8.53***	-0.68***	-1.62***
	(2.86)	(1.40)	(-19.13)	(-8.09)	(-3.13)
CF_t	2.67**	-4.83***	0.91	-0.13	4.72***
	(2.51)	(-4.85)	(1.17)	(-0.94)	(5.14)
$FSHR_t$	-0.62	-2.61***	0.91*	-0.08	0.98
	(-0.73)	(-5.48)	(1.71)	(-0.76)	(1.43)
Constant	17.63***	35.31***	68.56***	-1.26***	-20.18***
	(7.63)	(24.71)	(44.72)	(-4.27)	(-10.18)
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Observations	21,101	21,101	21,101	21,101	16,794
Adjusted R-squared	0.15	0.29	0.32	0.23	0.47

Table 6 The impact of margin call pressure on corporate ESG performance
This table presents the results of regressions of the effect of margin call pressure (MCP) on corporate ESG performance. We calculate the value-to-loan ratio which is the ratio of pledge value (the value of shares pledged at the end of the year) to loan value. Then, a pledge is of high MCP, moderate MCP, or low MCP if its value-to-loan ratio falls in (-∞, 140%], (140%, 160%], or [160%, +∞), respectively. Correspondingly, we define a dummy *High_MCP* (*Moderate_MCP* or *Low_MCP*) which takes 1 if a controlling shareholder pledge is of high (moderate or low) MCP, and 0 otherwise. Then we run regression for each of the dummies (*High_MCP* in column 1, *Moderate_MCP* in column 2, and *Low_MCP* in column 3) to investigate the impact of MCP on corporate ESG performance. Robust standard errors are clustered at the firm level, and t statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) ESG_{t+1}	(2) ESG_{t+1}	(3) ESG_{t+1}
CSP_t	-2.83***	-3.04***	-4.03***
	(-14.98)	(-16.09)	(-12.46)
$High\_MCP_t$	-1.13***		
	(-2.74)		
$CSP_t \times High\_MCP_t$	-0.30		
	(-0.49)		
$Moderate\_MCP_t$		-0.24	
		(-0.54)	
$CSP_t \times Moderate\_MCP_t$		0.48	
		(0.64)	
Low_MCP_t			0.40**
			(2.31)
$CSP_t \times Low\_MCP_t$			0.77**
			(2.02)
$Size_t$	1.26***	1.25***	1.27***
	(17.79)	(17.59)	(17.88)
ROA_t	18.76***	19.36***	18.74***
	(16.79)	(17.30)	(16.70)
MB_t	0.06	0.05	0.05
	(0.75)	(0.61)	(0.68)
LEV_t	-3.43***	-3.40***	-3.45***
	(-8.32)	(-8.22)	(-8.36)
CF_t	-0.32	-0.44	-0.29
	(-0.47)	(-0.65)	(-0.43)
$FSHR_t$	-0.49	-0.44	-0.47
	(-0.99)	(-0.88)	(-0.93)
Constant	46.43***	46.58***	46.23***
	(32.03)	(32.05)	(31.92)
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Observations	21,101	21,101	21,101
Adjusted R-squared	0.24	0.23	0.23

Table 7 Heterogenous impact: high pledging ratio vs. low pledging ratio

This table presents the results of regressions of the heterogenous effect of CSP on corporate ESG performance. In columns 1 and 2, we divide firms in our sample into high pledging ratio group (column 1) if a firm's pledging ratio is above average pledging ratio of the industry, and low pledge ratio group (column 2) otherwise. In columns 3 and 4, we divide firms in our sample into high pledging ratio group (column 3) if a firm's pledging ratio is above median pledging ratio of the industry, and low pledge ratio group (column 4) otherwise. Then we run the baseline regression for each subsample. For the main explanatory variable (*CSP*) and all the controls, robust standard errors are clustered at the firm level, and t statistics are reported in parentheses. We also report the difference in coefficients of CSP between the high pledging group and low pledging group (*High-Low*). For this difference, we report the chi-square (χ^2) statistic from Chow test. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Divided by	Industry average		Industry median	
	Low pledging ratio	*High pledging ratio*	*Low pledging ratio*	*High pledging ratio*
	(1)	(2)	(3)	(4)
Variables	ESG $_{t+1}$	ESG $_{t+1}$	ESG $_{t+1}$	ESG $_{t+1}$
CSP_t	-0.96	-4.34***	-1.86***	-5.30***
	(-1.09)	(-11.81)	(-4.66)	(-9.05)
High-Low	-3.38***		-3.44***	
	(11.97)		(21.88)	
$Size_t$	1.34***	1.08***	1.33***	0.99***
	(16.44)	(8.73)	(17.31)	(6.46)
ROA_t	16.66***	21.62***	17.02***	22.20***
	(12.00)	(12.60)	(13.31)	(11.37)
MB_t	0.03	0.12	0.02	0.16
	(0.39)	(1.03)	(0.27)	(1.05)
LEV_t	-3.60***	-3.41***	-3.44***	-3.92***
	(-7.33)	(-5.51)	(-7.55)	(-5.47)
CF_t	0.01	-0.72	-0.04	-0.78
	(0.02)	(-0.64)	(-0.05)	(-0.59)
$FSHR_t$	0.00	-2.38***	-0.32	-2.23**
	(0.01)	(-2.79)	(-0.59)	(-2.07)
Constant	43.53***	50.98***	43.55***	54.89***
	(24.82)	(18.61)	(26.29)	(15.73)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Observations	13,700	7,401	16,243	4,858
Adjusted R-squared	0.21	0.20	0.20	0.20

Table 8 The effect of CSP on corporate ESG disclosure quality

This table presents the results of the regressions that regress corporate ESG disclosure on controlling shareholder pledging (CSP), where *CSP* is the ratio of the controlling shareholder's shares pledged. We measure corporate overall ESG disclosure quality (*ESG_Q*), as well as the disclosure quality on environmental (*E_Q*), social (*S_Q*), and governance (*G_Q*) using Bloomberg ESG disclosure scores. Column 1 reports the regression results where the dependent variable is *ESG_Q*. Columns 2 to 4 report the regression results where the dependent variables are *E_Q*, *S_Q*, and *G_Q*, respectively. Robust standard errors are clustered at the firm level, and t statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1) ESG_DQ_{t+1}	(2) E_DQ_{t+1}	(3) S_DQ_{t+1}	(4) G_DQ_{t+1}
CSP_t	-3.27***	-2.98***	-4.00***	-1.88***
	(-7.52)	(-5.48)	(-6.16)	(-5.33)
$Size_t$	2.51***	2.68***	2.85***	1.30***
	(12.54)	(11.13)	(9.38)	(8.71)
ROA_t	-5.37**	-5.62*	-2.30	-5.88***
	(-2.24)	(-1.89)	(-0.61)	(-3.14)
MB_t	-0.10	-0.01	-0.22	-0.09
	(-0.57)	(-0.03)	(-0.84)	(-0.68)
LEV_t	-1.67	-2.96**	-3.38**	1.22
	(-1.54)	(-2.24)	(-2.07)	(1.49)
CF_t	4.57***	6.45***	1.24	2.74**
	(2.91)	(3.37)	(0.50)	(2.11)
$FSHR_t$	-1.24	-1.23	-1.18	0.26
	(-0.91)	(-0.69)	(-0.61)	(0.27)
Constant	-36.37***	-48.81***	-39.53***	15.86***
	(-8.61)	(-9.60)	(-6.23)	(5.08)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Observations	7,644	6,615	7,505	7,644
Adjusted R-squared	0.29	0.22	0.17	0.20

Table 9 Mediation effect of tunnelling and financial constraints

This table presents the results of the mediation tests of tunnelling and financial constraints in the impact of controlling shareholder pledging (CSP) on corporate ESG performance. In Panel A, we estimate the mediation effect using a two-stage mediation effect model. In columns 1 and 2, the mediating variable is tunnelling (*Tunnel*), which is measured as other receivables scaled by total assets (Jiang et al., 2010). In columns 3 and 4, the mediating variable is financial constraints (*FC*), which is measured by the KZ index (Kaplan and Zingales, 1997). The mediation effect (*Mediation Effect*) is statistically examined by the Sobel (1982) test, with the test statistic reported in the accompanying parentheses. For all other coefficients, robust standard errors are clustered at the firm level, and t statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. In Panel B, we use the bootstrap method from MacKinnon et al. (2004) to check the robustness of the mediation effect, in which we repeat the bootstrap sampling process for 5000 times. We report the mediation coefficient, bootstrap standard error (SE), and 95% confidence interval of the mediation coefficient based on the bootstrap.

Panel A	(1)	(2)	(3)	(4)
Variables	$Tunnel_t$	ESG_{t+1}	FC_t	ESG_{t+1}
CSP_t	0.00***	-2.96***	0.14***	-2.99***
	(3.49)	(-15.90)	(3.35)	(-16.02)
$Tunnel_t$		-15.62***		
		(-7.50)		
FC_t				-0.29***
				(-7.67)
Mediation Effect		-0.07***		-0.04***
		(-3.17)		(-3.07)
$Size_t$	-0.00***	1.22***	-0.16***	1.21***
	(-5.63)	(17.14)	(-9.32)	(16.93)
ROA_t	-0.04***	18.73***	-9.00***	16.79***
	(-5.88)	(16.82)	(-28.08)	(14.93)
MB_t	0.00	0.05	-0.06***	0.03
	(0.06)	(0.61)	(-4.13)	(0.37)
LEV_t	0.03***	-3.00***	6.21***	-1.62***
	(8.44)	(-7.28)	(61.69)	(-3.38)
CF_t	-0.02***	-0.68	-13.11***	-4.19***
	(-3.69)	(-1.01)	(-71.35)	(-5.10)
$FSHR_t$	-0.01***	-0.66	-0.45***	-0.57
	(-5.16)	(-1.31)	(-3.90)	(-1.13)
Constant	0.07***	47.65***	2.27***	47.22***
	(7.92)	(32.83)	(6.49)	(32.51)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Observations	21,101	21,101	21,101	21,101
Adjusted R-squared	0.14	0.24	0.72	0.24

Panel B	Coefficient	Bootstrap SE	Bootstrap-based 95% confidence interval	
Indirect (*Tunnel*)	-0.07	0.01	-0.09	-0.04
Indirect (*FC*)	-0.04	0.01	-0.06	-0.02

Table 10 The role of corporate monitors

This table presents the results of regression analyses of the impact of CSP on corporate ESG performance conditional on corporate monitoring characteristics. Column 1 reports the regression analysis of the impact of CSP on corporate ESG performance of firms with great internal control. *High_IC* is an indicator which takes the value of 1 if the firm's internal control (measured by DIB internal control index) is in the highest quartile, and 0 otherwise. Column 2 reports the regression analysis of the impact of CSP on corporate ESG performance of firms with high management shareholdings. *High_Mshare* is an indicator which takes the value of 1 if the firm's management shareholding is in the highest quartile, and 0 otherwise. Column 3 reports the regression analysis of the impact of CSP on corporate ESG performance of firms with high media coverage. *High_Media* is an indicator which takes the value of 1 if the number of times the firm appearing in financial news is in the highest quartile, and 0 otherwise. Column 4 reports the regression analysis of the impact of CSP on corporate ESG performance of firms with high fraction of independent directors on the board. *High_Indep* is an indicator which takes the value of 1 if the firm's fraction of independent directors on the board is in the highest quartile, and 0 otherwise. Column 5 reports the regression analysis of the impact of CSP on corporate ESG performance of firms with high institutional shareholdings. *High_Inst* is an indicator that takes the value of 1 if the fraction of shares held by institutional investors of the firm is in the highest quartile, and 0 otherwise. Robust standard errors are clustered at the firm level, and t statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) ESG_{t+1}	(2) ESG_{t+1}	(3) ESG_{t+1}	(4) ESG_{t+1}	(5) ESG_{t+1}
CSP_t	-3.15***	-3.31***	-2.91***	-2.99***	-2.85***
	(-16.03)	(-15.75)	(-14.54)	(-15.19)	(-14.26)
$High\_IC$	0.67***				
	(6.23)				
$High\_IC \times CSP_t$	0.86***				
	(3.22)				
$High\_Mshare_t$		0.49***			
		(2.84)			
$High\_Mshare \times CSP_t$		1.05***			
		(2.90)			
$High\_Media_t$			-0.13		
			(-0.90)		
$High\_Media \times CSP_t$			-0.46		
			(-1.45)		
$High\_Indep_t$				1.05***	
				(6.11)	
$High\_Indep \times CSP_t$				-0.51	
				(-1.28)	
$High\_Inst_t$					-0.01
					(-0.04)
$High\_Inst \times CSP_t$					-1.04***
					(-2.62)
$Size_t$	1.17***	1.30***	1.29***	1.23***	1.27***
	(16.40)	(18.04)	(17.22)	(17.43)	(17.38)

40

ROA_t	17.44***	18.57***	19.47***	19.43***	19.57***
	(15.42)	(16.45)	(17.38)	(17.44)	(17.53)
MB_t	0.06	0.04	0.03	0.04	0.04
	(0.85)	(0.47)	(0.42)	(0.58)	(0.54)
LEV_t	-3.52***	-3.25***	-3.37***	-3.33***	-3.40***
	(-8.55)	(-7.90)	(-8.17)	(-8.10)	(-8.25)
CF_t	-0.29	-0.16	-0.47	-0.43	-0.45
	(-0.42)	(-0.24)	(-0.69)	(-0.65)	(-0.66)
$FSHR_t$	-0.50	-0.28	-0.46	-0.53	-0.22
	(-1.00)	(-0.56)	(-0.92)	(-1.06)	(-0.41)
Constant	48.44***	45.26***	45.93***	46.79***	46.13***
	(33.34)	(30.30)	(30.19)	(32.45)	(30.72)
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Observations	21,101	21,101	21,101	21,100	21,101
Adjusted R-squared	0.24	0.24	0.23	0.24	0.23

Appendix

Table A1. Huazheng ESG rating framework

This table presents the Huazheng ESG rating framework. The framework assesses corporate ESG performance based on 44 key indicators across 16 sub-categories of environmental, social, and governance performance.

Category	Sub-category	Key indicators
Environmental	Climate change	Carbon emission, carbon planning, responses to climate change, green finance, sponge city
	Resource usage	Land usage and biodiversity, water consumption, material consumption
	Pollution	Industrial waste, hazardous waste, electronic waste
	Environmental friend	Renewable energy, green building, green factory
	Environmental management	Sustainable certification, supply chain management, environmental penalty
Social	Human resources	Staff health and safety, employee incentives and developments, employee relation
	Product responsibilities	Quality certification, product recall, complaints
	Supply chain	Supply chain risk and management, supply chain relation
	Social contribution	Social inclusive, community investment, employment, technological innovation
	Data security and privacy	Data security and privacy
Governance	Shareholder rights	Shareholder protection
	Governance structure	ESG governance, risk management, board structure, management stability
	Disclosure quality	ESG verification, disclosure reliability
	Governance risks	Behaviour of the largest shareholder, solvency, legal proceedings, taxation transparency
	External penalties	External penalties
	Business ethics	Business ethics, corruption and bribe

Table A2. Variable definitions

This table presents the definitions and sources of main variables used in this study.

Variable	Descriptions	Source
Dependent variables		
ESG	ESG performance scores by Huazheng	iFind
ESG2	Linear transformation of ESG performance grade by Huazheng	iFind
ESG3	ESG performance scores by QuantData	iFind
ESG_DQ	Bloomberg ESG disclosure quality	Bloomberg
Independent variables		
CSP	Ratio of the controlling shareholder's shares pledged	CSMAR
CSP_DUM	A dummy that takes 1 if the controlling shareholder pledges, and 0 otherwise	CSMAR
CSP_DUM2	A dummy that takes 1 if the controlling shareholder's pledging ratio is above the 75th percentile within the industry, and 0 otherwise	CSMAR
CSP_DUM3	A dummy that takes 1 if the controlling shareholder's pledging ratio is above median of the industry, and 0 otherwise	CSMAR
CSP2	Number of shares pledged by the controlling shareholder scaled by the firm's total number of shares outstanding	CSMAR
CSP_IND	Average pledging ratio of the industry	CSMAR
CSP_PRO	Average pledging ratio of the province	CSMAR
Tunnel	Other receivables scaled by total (Jiang et al., 2010)	CSMAR
FC	KZ index	CSMAR
Size	Natural logarithrm of total assets	CSMAR
ROA	Net income/total assets	CSMAR
MB	Market value of equity/book value of equity	CSMAR
LEV	Total debt/total assets	CSMAR
CF	Operating cash flows scaled by total assets	CSMAR
FSHR	Percentage of shares held by the largest shareholder	CSMAR

Table A3 Correlation matrix

This table presents the correlation matrix of main variables used in this study.

	ESG	ESG2	ESG3	ESG_DQ	CSP	CSP_DUM	CSP	Size	ROA	MB	LEV	CF	FSHR
ESG	1.00												
ESG2	0.98	1.00											
ESG3	0.40	0.40	1.00										
ESG_DQ	0.31	0.31	0.61	1.00									
CSP	-0.24	-0.24	-0.19	-0.20	1.00								
CSP_DUM	-0.17	-0.17	-0.17	-0.19	0.81	1.00							
CSP	-0.22	-0.22	-0.17	-0.19	0.94	0.78	1.00						
Size	0.20	0.20	0.43	0.45	-0.12	-0.14	-0.07	1.00					
ROA	0.13	0.13	0.02	-0.04	-0.04	0.04	-0.03	-0.13	1.00				
MB	0.10	0.09	0.24	0.26	-0.04	-0.09	-0.01	0.67	-0.35	1.00			
LEV	0.00	0.00	0.11	0.17	0.05	-0.01	0.08	0.55	-0.46	0.62	1.00		
CF	0.01	0.02	0.09	0.06	-0.07	-0.02	-0.06	-0.05	0.48	-0.16	-0.25	1.00	
FSHR	0.05	0.04	0.07	0.11	-0.20	-0.20	-0.02	0.25	0.03	0.12	0.10	0.06	1.00

Table A4 Comparison of propensity score matched sample

This table presents the differences in firm characteristics between treatment group and control group before and after the PSM in Section 3.2.

Variable	Unmatched Matched	Mean Treated	Control	Bias (%)	Reduction in bias (%)
Size	U	22.10	22.38	-21.50	
	M	22.17	22.14	2.00	90.70
ROA	U	0.0425	0.0477	-9.80	
	M	0.0454	0.0448	1.00	89.60
MB	U	0.971	1.172	-17.30	
	M	1.018	1.025	-0.60	96.40
LEV	U	0.4381	0.4259	6.00	
	M	0.4263	0.4280	-0.80	86.20
CF	U	0.0430	0.0522	-13.20	
	M	0.0473	0.0464	1.30	90.20
FSHR	U	0.3654	0.4038	-29.90	
	M	0.3769	0.3721	3.70	87.60