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The value of CSR during the COVID-19 crisis: Evidence from Chinese firms

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ABSTRACT

Using a sample of 3013 Chinese listed firms, we study the impact of Chinese firms’ corporate social responsibility (CSR) engagement on their stock returns during the COVID-19 crisis. We find that firms with more pre-crisis CSR engagement have worse crisis-period stock returns. The effect is larger for firms with more agency problems, less access to external financing, or worse pre-crisis financial conditions. Firms with more pre-crisis CSR engagement also show poorer post-crisis operating performance. Our results suggest that agency problems motivate Chinese managers to overinvest in costly CSR practices, which harms firm value during the unexpected crisis and impedes the firm’s recovery from it.

1. Introduction

Though corporate social responsibility (CSR) practices are conducted worldwide, the question of whether they enhance or harm firm value is still intensely debated (Buchanan et al., 2018). The stakeholder theory claims that CSR performance enhances the firm’s reputation and social capital and, in turn, increases firm value. That is, the firm can do well by doing good. In contrast, the agency theory suggests that managers intentionally overinvest in CSR for their own interest at the cost of shareholder wealth, resulting in a decrease in firm value. However, empirical studies reach mixed results on the relationship between CSR and firm value. Recent studies take the global financial crisis of 2008–2009 and the COVID-19 pandemic as exogenous shocks to the demand for CSR and re-examine the relationship (Lins et al., 2017; Buchanan et al., 2018; Bae et al., 2021; Demers et al., 2021; Garel and Petit-Romec, 2021). Those studies focus on developed markets, and, still, they reach inconclusive results.

In this study, we investigate the relationship between CSR and firm value during times of crisis by testing the impact of CSR on Chinese firms’ stock returns during the COVID-19 crisis in China, the world’s largest emerging market. The Chinese stock market is ideal for re-examining the relationship because it differs from developed markets in the institutional environment, culture, and CSR awareness. CSR practices in China are still preliminary (Wang and Li, 2016) and are commonly affected by political factors (Chang et al., 2021; Yu and Chi, 2021). Institutional ownership of Chinese firms is small, and retail investors’ demand for CSR remains weak (Broadstock et al., 2021). Also, Chinese firms face severe agency problems due to their concentrated and state-dominated ownership (Jiang and Kim, 2020) and opaque information environments (Piotroski et al., 2015). These features suggest that the driven source of

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Among others, Cho et al. (2013), Servaes and Tamayo (2013), Harjoto and Laksmana (2018), and Albuquerque et al. (2019) provide empirical evidence on the stakeholder theory. For empirical evidence on the agency theory, see Cespa and Cestone (2007), Barnea and Rubin (2010), and Benabou and Tirole (2010).
CSR and its impact on firm value in China can be different from those in developed countries. Besides, the outbreak of the COVID-19 pandemic was quickly controlled in China due to prompt interventions, offering us a long post-crisis period to observe how the firm’s pre-crisis CSR engagement is related to its post-crisis operating performance. In this way, we may not only document the impact of CSR on crisis-period stock returns but also reveal its causes. In comparison, prior studies focus on the impact of CSR during a certain short crisis period of the pandemic.\(^2\)

Using a sample of 3013 Chinese listed firms, we document a significantly negative relationship between their 2019 CSR scores and stock returns during the COVID-19 crisis in China. A one-standard-deviation increase in CSR scores is associated with a 1.67% (4.22%) decrease in raw returns (market-model adjusted cumulative abnormal returns) during the crisis period from January 23 to March 31, 2020. The negative impact of CSR on stock returns is robust when we employ alternative CSR measures, alternative CSR data sources, or alternative crisis periods and when we exclude industries particularly affected by the pandemic. The finding also holds in the difference-in-differences setting similar to that in Lins et al. (2017), confirming that the negative impact is due to the COVID-19 crisis rather than unobservable risk factors correlated with CSR in normal periods.

The negative impact of CSR on the crisis-period stock returns is consistent with the agency theory, which states that agency problems motivate managers to overinvest in costly CSR practices for their self-interests. When the COVID-19 pandemic unexpectedly broke out, the overinvestments may put firms in unfavorable financial situations, which impedes firms’ operations during the crisis and their recovery from the crisis. Anticipating these effects, investors more negatively react to firms with more pre-crisis CSR engagement. This explanation is supported by our finding on the moderating roles of agency problems and financial conditions in the negative impact of CSR. In particular, we find that the negative impact of CSR is more pronounced for firms with more agency problems, less access to external financing, or worse pre-crisis financial conditions. We also find direct evidence for the detrimental impact of CSR on firms’ operations during the crisis and recovery from the crisis. Chinese firms with more pre-crisis CSR engagement exhibit poorer crisis-period and post-crisis period operating performance measured by firms operating income, gross margins, and return on assets.

Our study contributes to the debate on the impact of CSR on firm value, especially during times of crisis. Studies based on the stakeholder theory suggest that CSR helps build social capital that offers insurance-like pay-offs by protecting stock prices against unexpected crises (Lins et al., 2017). In contrast, studies relying on the agency theory argue that managers overinvest in CSR for their own good due to agency problems, which is especially detrimental to firm value during times of crisis (Buchanan et al., 2018). Recent studies on the current COVID-19 pandemic document either a significantly positive impact or an insignificant impact of CSR on stock returns (Bae et al., 2021; Ding et al., 2021). Unlike these studies, we reveal a significantly negative impact on the Chinese stock market, which is featured by its opaque information environment and severe agency conflict. Therefore, we enrich the literature by showing that the impact of CSR on firm value may largely be subject to the institutional environments.

Our study is closely related to but significantly differs from Zhang et al. (2020) and Broadstock et al. (2021). While Zhang et al. (2020) find that CSR insignificantly impacts stock price declines during the 2015 Chinese stock market crash, we show that CSR causes stock price declines for Chinese firms during the COVID-19 crisis that differs from past financial crises in its cause, scope, and severity (Ding et al., 2021). Broadstock et al. (2021) use a sample of China’s CSI300 constituents and find that their ESG (environmental, social, and governance) scores are positively related to their stock returns over the short window (\([-5,5]\)) around January 23, 2020. On that day, the China authority officially announced the lockdown of Wuhan, where the COVID-19 pandemic first broke out. In comparison to Broadstock et al. (2021), we use the full sample of firms in the Chinese stock market and document a negative impact of CSR on stock returns during the crisis period from January 23 to March 31, 2020. The large sample ensures that our finding is free of selection bias. The extended period mitigates the concern that the impact of CSR on stock returns is due to investors’ temporary and irrational panic. Additionally, we find a significantly negative impact of CSR on operating performance during both the crisis and post-crisis periods, which justifies our finding on the negative impact.

We also contribute to the fast-growing research on the impact of the COVID-19 crisis on stock returns. Existing studies reveal that the impact varies depending on firms’ exposure to China (Ramelli and Wagner, 2020), environmental and social ratings (Albuquerque et al., 2020), corporate governance (Ding et al., 2021), and financial flexibility (Fahlenbrach et al., 2021). We enrich these studies by revealing the negative impact of CSR on stock returns during the COVID-19 crisis in China and the moderating roles of firms’ agency problems and financial conditions. Specifically, we find that CSR causes larger stock price declines for Chinese firms with more agency problems, less access to external financing, or worse pre-crisis financial conditions. These results highlight the value of corporate governance and financial flexibility during times of crisis. In this way, the Chinese evidence in our study complements the studies of Ding et al. (2021) and Fahlenbrach et al. (2021).

We organize the remainder of this study as follows. Section 2 reviews related studies and develops hypotheses. Section 3 describes our sample, variables, and methodology. In Section 4, we study the impact of CSR on crisis-period stock returns. Section 5 investigates the moderating roles of agency problems and financial conditions and studies the impact of CSR on operating performance. Section 6 concludes.

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\(^2\) From March 13, 2020 to December 31, 2021, new COVID-19 cases (deaths) in mainland China on a given day are no more than 231 (14). The numbers are much smaller compared to other countries, given that China has the world’s largest population.

\(^3\) For example, Ding et al. (2021) collect data from January through May 2020; Bae et al. (2021) use a sample period from February 18 to March 20, 2020, and Garel and Petit-Romac (2021) focus on the period from February 20 to March 20, 2020.
2. Literature review and hypothesis development

2.1. CSR and firm value

Two theories, i.e., the stakeholder theory and the agency theory, are widely employed in the literature to explain how CSR is related to firm value, and they offer opposite views. The stakeholder theory states that CSR performance helps maximize long-term shareholder wealth by “doing well by doing good.” Specifically, CSR performance mitigates information asymmetry and, therefore, firm risk (Cho et al., 2013; Harjoto and Laksmana, 2018). Due to their lower risk, high CSR firms exhibit lower capital costs (El Ghoul et al., 2011; Goss and Roberts, 2011) and larger product differentiation, which rewards firms with higher profit margins (Albuquerque et al., 2019). Consumers are also likely to transform a good CSR record into a positive corporate evaluation, product association, and purchase intention (Servaes and Tamayo, 2013). Also, CSR may enhance firm value by offering insurance-like effects on stock prices during negative events (Lins et al., 2017; Shiu and Yang, 2017).

Meanwhile, the agency theory suggests that firms’ CSR engagement is motivated by managers’ self-interested behaviors, which are caused by agency problems and decrease firm value (Tirole, 2001). For example, Benabou and Tirole (2010) document that corporations often donate to charities or institutions that their top management favors. Cespa and Gestone (2007) state that engaging in CSR activities is an ineffective entrenchment strategy for inefficient CEOs to keep them from being replaced. Barnea and Rubin (2010) argue that firm insiders seek to overinvest in CSR to improve their own reputations as good global citizens. In addition, several studies show that firms heavily monitored by internal or external governance mechanisms exhibit low CSR performance (Cheng et al., 2020; Masulis and Reza, 2015; Kruger, 2015; Adhikari, 2016), implying that CSR is at least partly due to agency problems.

2.2. Impact of CSR on firm value during times of crisis

The mixed empirical results highlight the challenge of identifying the causal impact of CSR on firm value. One reason for this challenge is the endogeneity issue between firms’ CSR performance and financial performance. A positive relationship may suggest that firms can do well by doing good. However, the alternative interpretation of the relationship is that they do good when they do well (Lys et al., 2015). For this reason, recent studies employ the global financial crisis of 2008–2009 and the ongoing COVID-19 pandemic as exogenous shocks to CSR demands and re-examine the relation between CSR and firm value. The stakeholder theory claims that CSR helps build firm-specific social capital and trust. If so, it is more likely to pay off during crisis periods when trustworthiness is more valuable (Lins et al., 2017). Meanwhile, the agency theory suggests that managers overinvest in CSR for their own interests (Kruger, 2015), which is exceptionally costly during crisis periods and damages firm value (Buchanan et al., 2018).

Still, existing studies reach inconclusive results on the impact of CSR on firm value during times of crisis. Lins et al. (2017) document that American firms with better CSR performance had higher stock returns during the 2008–2009 financial crisis. In contrast, Buchanan et al. (2018) find that high CSR American firms have higher firm values before the financial crisis but experience more loss in firm value during the crisis. Ding et al. (2021) use data across 61 economies and find that the drop in stock returns during the COVID-19 pandemic is milder for firms with more CSR activities. Bose et al. (2021) reach similar conclusions using data from 47 countries. However, Bae et al. (2021) document an insignificant relationship between American firms’ CSR performance and their stock returns during the COVID-19 stock market crash. Studies on topics related to CSR, such as environmental, social, and governance (ESG), also reach mixed results. Garel and Petit-Romec (2021) claim that U.S.-listed firms with responsible strategies on environmental issues exhibit better stock returns during the COVID-19 market crash. On the contrary, Demers et al. (2021) conclude that ESG does not impact stock returns on U.S. firms during the COVID crisis. Similarly, Takahashi and Yamada (2021) find an insignificant impact of ESG on Japanese firms.

2.3. Hypothesis development

This study intends to offer additional evidence on the inconclusive impact of CSR on firm value during times of crisis. Specifically, we focus on the question of how CSR is related to stock returns on Chinese firms during the COVID-19 pandemic. Existing studies on the relationship between CSR performance and firm value in China reach mixed results as they do in other markets. Accordingly, they offer unclear implications on the answer to the question and motivate our study.

On the one hand, the CSR awareness of the Chinese public is still weak, and CSR practices are not common for Chinese firms compared to their peers in developed countries (Yin and Zhang, 2012). According to a survey reported in the China Sustainable Investment Review 2020, 42% of respondents claim that they have never heard about “green investment,” “social responsibility investment,” or “ESG.” Also, there is rich literature showing that the CSR engagement for both state-owned and non-state-owned Chinese firms is largely driven by managers’ political motivations rather than stakeholder welfare or shareholder wealth (Guo et al., 2018; Chang et al., 2021; Yu and Chi, 2021; Zhang et al., 2021; Zhou et al., 2021). That is, it is likely to be caused by agency problems and be detrimental to firm value.

On the other hand, there is empirical evidence supporting a positive relationship between CSR and firm value for Chinese firms. For example, Tian et al. (2011) find that Chinese consumers value CSR performance and show greater purchase intention on the products...
of firms with better CSR records. Wang and Li (2016) document significantly positive market reactions to the CSR reports disclosed by Chinese firms, implying that investors offer valuation premiums for CSR initiators. Additionally, Gong et al. (2018) find that Chinese firms associated with higher CSR disclosure quality exhibit lower debt costs.

Two studies explore the role of CSR or ESG in determining stock returns on Chinese firms during times of crisis. Again, they reach inconsistent conclusions. Zhang et al. (2020) find that Chinese firms’ CSR performance does not enhance their stock returns during the 2015 Chinese stock market crash. Broadstock et al. (2021) conduct event studies and find that Chinese firms with higher ESG ratings experience better stock returns during the [-5,5] window around the Wuhan lockdown. In summary, existing studies offer inconclusive implications on the relationship between Chinese firms’ CSR performance and their stock returns during the COVID-19 crisis. Accordingly, we propose a pair of competing hypotheses as follows:

**Hypothesis H1a.** Chinese firms with higher CSR engagement are associated with higher stock returns during the COVID-19 crisis.

**Hypothesis H1b.** Chinese firms with higher CSR engagement are associated with lower stock returns during the COVID-19 crisis.

3. Data and methodology

3.1. Sample

To construct our sample, we begin with all firms listed on the Shanghai Stock Exchange (SSE) or the Shenzhen Stock Exchange (SZSE) in China. We then exclude financial firms and firms specially treated due to their delisting risk. In Section 4.2.4, we define 2019 as the pre-crisis period and compare the impact of CSR performance on stock returns during the pre-crisis and crisis period. For the consideration of this, we exclude firms that are listed later than January 1, 2018. After excluding firms with missing data on CSR engagement and control variables, our final sample for the crisis period consists of 3013 firms. We obtain stock return data and accounting data from the China Stock Market & Accounting Research Database (CSMAR). To reduce the effect of outliers, we winsorize all continuous variables at the 1st and 99th percentiles.

3.2. Baseline model

Following Lins et al. (2017) and Bae et al. (2021), we estimate the following model to investigate the impact of CSR performance on stock returns during the COVID-19 crisis in China:

\[
R_{i,\text{crisis}} = \alpha + \beta_1 \text{HX}_i \cdot \text{CSR}_{i,2019} + \sum \beta_k \text{Firm Characteristics} + \sum \beta_m \text{Factor Loadings} + \text{Industry FE} + \epsilon_i
\]

where \(R_{i,\text{crisis}}\) is the stock return on firm \(i\) during the crisis period defined as January 23 to March 31, 2020. On January 23, 2020, the Chinese authority officially announced the lockdown of Wuhan, where the COVID-19 was first identified. Shortly after that, most provinces of China entered into “lockdown” due to the widely spread of the COVID-19 cases. COVID-19 vastly spread to the whole world as well. On March 11, 2020, the World Health Organization (WHO) classified COVID-19 as a global pandemic. Since then, lockdown policies have been globally adopted and triggered enormous price movements in major stock markets (Ding et al., 2021). Influenced by these factors, the Chinese stock markets started to show a sign of crashing in mid-March 2020. As discussed later in Section 3.3, the stock prices of more than 75% of our sample firms declined from January 23 to March 31, 2020. More specifically, the stock prices of one-half of these firms declined by more than 11% during the period. These figures confirm that it is reasonable to define the period as the crisis period for the Chinese stock market.

Similar to the studies of Lins et al. (2017) and Bae et al. (2021), we measure the firm’s crisis-period stock return as both its raw return (\(\text{RawRet}_{i,\text{crisis}}\)) and market model-adjusted cumulative abnormal return (\(\text{CAR}_{i,\text{crisis}}\)). To calculate \(\text{CAR}_{i,\text{crisis}}\), we estimate the market model using daily firm and market returns over the previous 240 trading days ending in 10 trading days before the lockdown of Wuhan. That is, we use the estimation window of \([-240, -11]\). The primary independent variable of interest is the firm’s CSR performance in 2019 (\(\text{HX}_i \cdot \text{CSR}_{i,2019}\)). Following Xiang et al. (2021), we obtain CSR data from Hxun.com (HX hereafter), a leading internet financial media firm in China that has issued annual CSR scores for Chinese firms since 2010. HX constructs CSR scores with a framework of three layers. The first layer covers five dimensions, including shareholder responsibility, employee responsibility, customer responsibility, environmental responsibility, and social responsibility. The second layer comprises 13 criteria supporting the five dimensions, and the third layer comprises 37 criteria supporting the second one.

In Eq. (1), we control for a set of firm characteristics and factor loadings similar to that in Lins et al. (2017). Specifically, we control for the firm’s 2019 year-end market capitalization (\(\text{Ln}(\text{MV})_{i,2019}\)), short-term debt (\(\text{SDebt}_{i,2019}\)), long-term debt (\(\text{LDebt}_{i,2019}\)), cash holdings (\(\text{Cash}_{i,2019}\)), profit (\(\text{Profit}_{i,2019}\)), book-to-market ratio (\(\text{BM}_{i,2019}\)), past stock returns (\(H\text{Ret}_{i,2019}\)), and idiosyncratic risk (\(\text{IV}_{i,2019}\)). Also, we control for the firm’s factor loadings on the Fama-French three-factor model plus the momentum factor. We use monthly returns over 60 months ending in December 2019 to estimate these loadings and denote them as \(\text{Beta}_M_{i,2019}\), \(\text{Beta}_{\text{SIZE}}_{i,2019}\), \(\text{Beta}_{\text{BM}}_{i,2019}\), and \(\text{Beta}_{\text{MOM}}_{i,2019}\), respectively. Finally, we include industry fixed effects in Eq. (1). Firms are classified into 18 industries.
industries based on the industry classification guidance issued by the China Securities Regulatory Commission (CSRC) in 2012.

3.3. Summary statistics

We report descriptive statistics for our main variables in Panel A of Table 1. The first row shows that the median and the 75th percentile of firms’ raw stock returns (RawRet_{crisis}) from January 23 to March 31, 2020 are −0.1120 and −0.0059, respectively. These figures suggest that more than 75% of sample stocks’ prices declined during the period, and one-half of the stocks’ prices declined by more than 11%. Similarly, the median of the cumulative abnormal returns during the period (CAR_{crisis}) is −0.0835. In summary, the distribution of RawRet_{crisis} and CAR_{crisis} confirm that the Chinese stock market was in crisis during the period. Accordingly, our definition of the crisis period and empirical setting based on the definition is appropriate.

The mean value of firms’ 2019 HX CSR scores (HX CSR_{2019}) is small (19.4686) relative to the full score of 100, consistent with the notion that CSR in China is still at its beginning stage (Wang and Li, 2016). In Panel B, we sort sample firms into quartiles based on their 2019 HX CSR scores. We then compare the mean values of crisis-period returns and control variables across quartiles. Both raw returns

### Table 1
Summary statistics.

| Panel A Full sample | Variable | N | mean | sd  | p25 | median | p75 |
|---------------------|----------|---|-----|-----|-----|--------|-----|
| RawRet_{crisis}     | 3013     | −0.0739 | 0.1593 | −0.1760 | −0.1120 | −0.0059 |
| CAR_{crisis}        | 3013     | −0.0244 | 0.3335 | −0.2348 | −0.0835 | 0.1195 |
| HX CSR_{2019}       | 3013     | 19.4686 | 7.9594 | 15.8040 | 20.6370 | 24.9570 |
| HRet_{2019}         | 3013     | 0.2899 | 0.4128 | 0.0306 | 0.1741 | 0.4445 |
| Ln(MV)_{2019}       | 3013     | 15.3832 | 1.0629 | 14.6533 | 15.2139 | 15.9758 |
| Profit_{2019}       | 3013     | 0.6140 | 0.3863 | 0.3685 | 0.5309 | 0.7552 |
| BM_{2019}           | 3013     | 0.5630 | 0.3823 | 0.2912 | 0.4608 | 0.7364 |
| SDebt_{2019}        | 3013     | 0.3381 | 0.1625 | 0.2095 | 0.3258 | 0.4486 |
| LDebt_{2019}        | 3013     | 0.0630 | 0.0864 | 0.0000 | 0.0237 | 0.0976 |
| Cash_{2019}         | 3013     | 0.1991 | 0.1337 | 0.1018 | 0.1657 | 0.2616 |
| IV_{2019}           | 3013     | 0.0959 | 0.0394 | 0.0712 | 0.0887 | 0.1107 |
| Beta,MKT_{2019}     | 3013     | 1.0075 | 0.4826 | 0.7873 | 1.0047 | 1.2228 |
| Beta,SIZE_{2019}    | 3013     | 0.6317 | 1.3117 | 0.0601 | 0.5254 | 1.0342 |
| Beta,BM_{2019}      | 3013     | −0.3201 | 1.4077 | −1.0017 | −0.3175 | 0.3974 |
| Beta,MOM_{2019}     | 3013     | −0.0708 | 1.0634 | −0.4358 | −0.0404 | 0.3033 |

| Panel B Subsamples based on CSR quartiles | Variable | Quartiles based on HX CSR_{2019} | Bottom - Top | Diff | T-statistics |
|----------------------------------------|----------|----------------------------------|---------------|------|--------------|
| RawRet_{crisis}                        | −0.0574  | −0.0580  | −0.0766 | −0.1036 | 0.0462***  | (5.87)   |
| CAR_{crisis}                          | 0.0167   | 0.0094  | −0.0339 | −0.0899 | 0.1066***  | (6.43)   |
| HX CSR_{2019}                         | 8.5622   | 18.3683 | 22.9215 | 28.0289 | −19.466*** | (−8.00)  |
| HRet_{2019}                          | 0.2671   | 0.2781  | 0.2934  | 0.3173  | 0.0503**   | (−2.39)  |
| Ln(MV)_{2019}                        | 15.0671  | 15.2567 | 15.4022 | 15.7984 | −0.7313*** | (−13.93) |
| Profit_{2019}                         | 0.5921   | 0.5974  | 0.6420  | 0.6246  | −0.0325    | (−1.58)  |
| BM_{2019}                            | 0.5335   | 0.5805  | 0.5629  | 0.5751  | −0.0416**  | (−2.09)  |
| SDebt_{2019}                         | 0.3802   | 0.3446  | 0.3179  | 0.3096  | 0.0705***  | (8.18)   |
| LDebt_{2019}                         | 0.0607   | 0.0626  | 0.0637  | 0.0651  | −0.0044    | (−0.97)  |
| Cash_{2019}                          | 0.1647   | 0.1737  | 0.2102  | 0.2479  | −0.0832**  | (−12.08) |
| IV_{2019}                            | 0.1053   | 0.0977  | 0.0930  | 0.0877  | 0.0176***  | (8.88)   |
| Beta,MKT_{2019}                      | 1.0592   | 1.0143  | 1.0046  | 0.9518  | 0.1074***  | (4.11)   |
| Beta,SIZE_{2019}                     | 0.8675   | 0.6660  | 0.6143  | 0.3787  | 0.4888***  | (7.68)   |
| Beta,BM_{2019}                       | −0.2759  | −0.3128 | −0.3369 | −0.3549 | 0.0791     | (1.03)   |
| Beta,MOM_{2019}                      | −0.1415  | −0.0665 | −0.0370 | −0.0382 | −0.1032*   | (−1.78)  |

In Panel A of this table, we report the number of observations, mean values, standard deviations, 25 percentiles, medians, and 75 percentiles of main variables used in this study. RawRet_{crisis} and CAR_{crisis} are the raw stock return and the market model-adjusted cumulative abnormal return on stock i over the COVID-19 crisis period from January 23 to March 31, 2020, respectively. HX CSR_{2019} is firm i’s 2019 CSR score issued by Hexun.com. HRet_{2019} is the raw stock return on firm i over the previous 12 months ending in December 2019. Ln(MV)_{2019} is the natural logarithm of firm i’s market capitalization (in Chinese Yuan) at the end of 2019. Profit_{2019} is firm i’s operating income divided by assets at the end of 2019. BM_{2019} is firm i’s book value divided by its market value at the end of 2019. SDebt_{2019} is firm i’s debt in current liabilities divided by assets at the end of 2019. LDebt_{2019} is firm i’s long-term debt divided by assets at the end of 2019. Cash_{2019} is firm i’s cash and marketable securities divided by assets at the end of 2019. Beta,MKT_{2019}, Beta,SIZE_{2019}, Beta,BM_{2019}, and Beta,MOM_{2019} are the loading on the market premium, the size premium, the book-to-market premium, and the momentum premium, respectively. The loadings are based on the Fama-French three-factor model plus the momentum factor and are estimated over the previous 60 months ending in December 2019. In Panel B, we sort sample firms into quartiles based on HX CSR_{2019} and compare the mean values of main variables across quartiles. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.
(\text{RawRet}_{\text{crisis}}) and cumulative abnormal returns (\text{CAR}_{\text{crisis}}) decrease monotonically with the CSR quartiles. For example, the mean value of \text{CAR}_{\text{crisis}} for the bottom CSR quartile is 0.0167, and that for the top CSR quartile is 0.0899. The difference (bottom minus top) is 0.1066 with a t-statistic of 6.43. These results are consistent with Hypothesis H1b, stating that Chinese firms with more CSR engagement are associated with lower stock returns during the COVID-19 crisis. However, the firm characteristics and factor loadings also significantly differ across quartiles. Hence, we rely on the multivariate regressions in the following sections to formally test our hypotheses.

4. Impact of CSR on stock returns during the COVID-19 crisis

4.1. Baseline model regressions

In Table 2, we report our regression results on the baseline model shown in Eq. (1). We use the firm’s raw crisis-period return (\text{RawRet}_{\text{crisis}}) as the dependent variable in Columns (1) and (3) and use the firm’s cumulative abnormal returns (\text{CAR}_{\text{crisis}}) in Columns (2) and (4). We control for the set of firm characteristics in Columns (3) and (4) and include factor loadings and industry fixed effects in all columns. Robust standard errors are used to infer the significance levels of estimated coefficients.

The coefficients of the firm’s 2019 HX CSR score (HX\text{CSR}_{i,2019}) are negative with a 1% significance level in all columns of Table 2, implying that Chinese firms’ pre-crisis CSR engagement significantly and negatively impacts their crisis-period stock returns. The impact is also of economic significance. The coefficient of HX\text{CSR}_{i,2019} is \(-0.0021\) in Column (3) and \(-0.0053\) in Column (4). These results suggest that a one-standard-deviation increase in HX\text{CSR}_{2019} (7.9594) is associated with a (0.0021 \times 7.9594 =) 1.67% decrease in crisis-period raw returns and a (0.0053 \times 7.9594 =) 4.22% decrease in cumulative abnormal returns. The decreases are relatively large given that the mean value of \text{RawRet}_{\text{crisis}} is \(-7.39\%\), and that of \text{CAR}_{\text{crisis}} is \(-2.44\%\).

In summary, Table 2 suggests a significantly negative relationship between Chinese firms’ pre-crisis CSR performance and their crisis-period stock returns, consistent with Hypothesis H1b. As discussed in Section 2.3, the agency theory offers possible explanations for the negative relationship. The CSR awareness of the Chinese public is weak (Yin and Zhang, 2012), and Chinese firms face severe agency problems (Jiang and Kim, 2020). Investors may view CSR as a costly investment initiated by managers’ self-interest behaviors and generate overinvestment concerns on firms’ CSR engagement. The overinvestment is destructive to firm value during the unexpected COVID-19 crisis when financial flexibility is of great value (Fahlenbrach et al., 2021). Considering this, investors react more negatively to Chinese firms with more pre-crisis CSR engagement after the pandemic broke out. The results in Table 2 also coincide with Zhang et al. (2020), which suggests that CSR does not offer insurance-like effects for Chinese firms during the crisis period as it may do for American firms.

4.2. Robustness tests

4.2.1. Alternative CSR engagement measures

We check the robustness of the negative relationship between Chinese firms’ CSR engagement and their crisis-period returns in several ways. First, we check the robustness of the negative relationship by alternatively measuring firms’ CSR engagement. In Table 3, we measure firms’ CSR engagement as their 2019 CSR scores that range from 0 to 100. In Columns (1) and (2) of Table 3, we divide firms into quartiles based on their 2019 CSR scores and set dummies for the quartiles. Specifically, CSR\text{Q2}_{i,2019}, CSR\text{Q3}_{i,2019}, and CSR\text{Q4}_{i,2019} equals 1 if firm i is in the second quartile, the third quartile, or the fourth quartile, respectively. Otherwise, these dummies equal 0. We then use these dummies as CSR measures and re-estimate the baseline model. Using CSR quartile dummies as explanatory variables also helps to investigate whether the negative impact of CSR on crisis-period returns is only due to firms with very high CSR engagement.

Columns (1) and (2) of Table 3 show that firms in higher CSR quartiles are associated with worse crisis-period returns. The coefficient of CSR\text{Q4}_{i,2019} is \(-0.0370\) in Column (1) and \(-0.0969\) in Column (2). The results show that the difference in raw crisis-period returns between firms in the bottom and top CSR quartiles is \(-3.70\%) and the difference in cumulative abnormal returns is \(-0.0969\). Additionally, Column (2) suggests that the impact of CSR on cumulative abnormal returns is monotonic. The cumulative abnormal returns decrease by 1.01% when moving from the bottom CSR quartile to the second quartile. A move from the second quartile to the third quartile yields a 3.87% decrease in abnormal returns, and that from the third quartile to the top quartile yields a 4.81% decrease in abnormal returns. These results indicate that investors are most concerned about firms with the highest CSR engagement. Intuitively, those firms are the most likely to overinvest in costly CSR practices and subsequently suffer from poor financial conditions during the unexpected COVID-19 pandemic.

Table 2 measures Chinese firms’ pre-crisis CSR performance as their 2019 HX CSR scores. HX at least partially relies on firms’ disclosed CSR reports to evaluate their CSR performance. Meanwhile, Chinese firms usually disclose these reports along with their annual financial reports from January to April. The COVID-19 pandemic broke out in China in the first quarter of 2020 when firms were about to disclose their 2019 CSR reports. Accordingly, firms anticipating the impact of CSR on firm value during the COVID-19 crisis may selectively report their CSR practices to cater to investors’ demand for CSR during the crisis.

Following the ideal of Lins et al. (2017), we measure Chinese firms’ pre-crisis CSR performance as their lagged CSR scores (i.e., 2018 CSR scores) to mitigate this concern. Columns (3) to (4) of Table 3 report the baseline model regression results using firms’ 2018 HX CSR scores (HX\text{CSR}_{i,2018}) as the independent variable. The results are qualitatively similar to those in Table 2 and still suggest that firms with higher pre-crisis CSR performance are associated with significantly lower crisis-period returns. Thus, the findings in Table 2 are robust.
Loving Consulting for Common Welfare Co.Ltd. (RKS). Following the framework of the U.S. social investment rating agency Kinder, Lydenberg, Domini & Co., Inc. (KLD), RKS annually evaluates Chinese firms’ CSR practices with more than 70 indicators based on four CSR dimensions: philanthropy, governance, diversity, employee relations, environment, and products. For each dimension, CNRDS uses a set of dummies to indicate firms’ CSR strengths.

Second, we gather information on firms’ CSR ratings from the CESG Database constructed by the Chinese Research Data Service Platform (CNRDS). The CESG Database is similar to the MSCI ESG Stats Database used in Lins et al. (2017) and covers six dimensions: philanthropy, governance, diversity, employee relations, environment, and products. For each dimension, CNRDS uses a set of dummies to indicate firms’ CSR strengths. Following Lins et al. (2017), we scale firms’ strengths for each dimension by dividing the number of their strengths by the maximum number of strengths possible for that dimension. To construct the final CSR measure, we exclude the governance dimension and the product dimension as Lins et al. (2017) do. In Columns (5) to (8) of Table 4, we construct the CNRDS CSR measure based on firms’ 2019 CNRDS CSR ratings and denote it as \( CNRDS_{CSR,2019} \).

### Table 2
Baseline regression results.

| Dep Var \( \Delta H_{CSR,2019} \) | (1) RawRet\( i,\text{crisis} \) | (2) CAR\( i,\text{crisis} \) | (3) RawRet\( i,\text{crisis} \) | (4) CAR\( i,\text{crisis} \) |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| \( HX_{CSR,2019} \) | -0.0023*** | -0.0060*** | -0.0021*** | -0.0053*** |
| \( \text{Ln(MV)}_{2019} \) | \((-5.79)\) | \((-6.98)\) | \((-4.74)\) | \((-5.92)\) |
| \( SDebt_{2019} \) | 0.0050 | 0.0190 | -0.0078*** | -0.0305*** |
| \( LDebt_{2019} \) | (0.24) | (0.45) | (-2.68) | (-5.04) |
| \( Cash_{2019} \) | -0.0347 | -0.0572 | (-0.88) | (-0.71) |
| \( Profit_{2019} \) | -0.0551** | -0.0818 | (-2.20) | (-1.59) |
| \( BM_{2019} \) | 0.0103 | 0.0622*** | (1.19) | (3.46) |
| \( HRet_{2019} \) | -0.0133 | -0.0257 | (-1.53) | (-1.46) |
| \( IV_{2019} \) | 0.0177* | 0.0424*** | (-6.87) | (-11.90) |
| \( \text{Beta}_{MKT,2019} \) | 0.0036 | 0.0109 | 0.0029 | 0.0018 |
| \( \text{Beta}_{SIZE,2019} \) | (-0.53) | (1.85) | (0.027) | (3.01) |
| \( \text{Beta}_{BM,2019} \) | -0.0036 | -0.0218*** | 0.0029 | 0.0018 |
| \( \text{Beta}_{MOM,2019} \) | (-1.41) | (-3.48) | (0.101) | (0.27) |
| Constant | -0.0026 | -0.0108** | -0.0100*** | -0.0251*** |
| \( \text{Industry FE} \) | No | No | No | No |
| \( \text{N} \) | 3013 | 3013 | 3013 | 3013 |
| Adj R\(^2\) | 0.0412 | 0.0359 | 0.0050 | 0.0019 |

This table presents the regression results on the baseline model in Eq. (1) to show the impact of firms’ CSR engagement on their COVID-19 crisis-period returns. Crisis-period returns are measured as raw returns (RawRet\( i,\text{crisis} \)) or market model-adjusted cumulative abnormal returns (CAR\( i,\text{crisis} \)) over the period from January 23 to March 31, 2020. The independent variable of main interest is \( HX_{CSR,2019} \), firm \( i \)'s 2019 CSR score issued by Hexun.com. We include the firm’s factor loadings in all regressions, which are based on the Fama-French three-factor model plus the momentum factor, and denoted as \( \text{Beta}_{MKT,2019} \), \( \text{Beta}_{SIZE,2019} \), \( \text{Beta}_{BM,2019} \), and \( \text{Beta}_{MOM,2019} \), respectively. We also add a set of firm characteristics in Columns (3) and (4). Specifically, we control for firm \( i \)'s 2019 year-end market capitalization (\( \text{Ln(MV)}_{2019} \)), short-term debt (SDebt\( _{2019} \)), long-term debt (LDebt\( _{2019} \)), cash holdings (Cash\( _{2019} \)), profit (Profit\( _{2019} \)), book-to-market ratio (BM\( _{2019} \)), and idiosyncratic risk (IV\( _{2019} \)). IV\( _{2019} \) is the residual variance obtained from the regression of firm \( i \)'s monthly returns on market returns. IV\( _{2019} \) and factor loadings are estimated over the previous 60 months ending in December 2019. All variables are defined in detail in the Appendix. Industry fixed effects are included in all regressions. T-statistics reported in parentheses are based on robust standard errors. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.

#### 4.2.2. Alternative CSR data source
In Table 2, CSR scores issued by Hexun.com are used to measure the firm’s CSR performance. Alternatively, we obtain firms’ CSR data from two alternative sources and re-estimate the baseline model in Table 4. First, we use CSR scores issued by the Running and Loving Consulting for Common Welfare Co.Ltd. (RKS). Following the framework of the U.S. social investment rating agency Kinder, Lydenberg, Domini & Co., Inc. (KLD), RKS annually evaluates Chinese firms’ CSR practices with more than 70 indicators based on four dimensions. Using these indicators, RKS assigns annual CSR scores to Chinese firms, which are widely employed in existing studies on CSR-related topics in China (Gong et al., 2018; Zhang et al., 2018; Xiang et al., 2021). In Columns (1) to (4) Table 4, we use firms’ 2019 RKS CSR scores as the independent variable and denote them as \( RKS_{CSR,2019} \).

For example, CNRDS uses a dummy that equals 1 for firms making charitable donations in a given year and 0 otherwise. Hence, the dummy indicates whether there is a CSR strength in the philanthropy dimension for a given firm.
Table 3
Robustness tests: alternative CSR measures.

| Dep Var= | (1)          | (2)          | (3)          | (4)          |
|----------|--------------|--------------|--------------|--------------|
| CSR_Q2,2019 | 0.0012      | –0.0101      | –0.0151      | –0.0019      |
|           | (0.13)       | (–0.57)      | (–0.90)      | (–0.57)      |
| CSR_Q3,2019 | –0.0140     | –0.0488***   | –0.0469***   | –0.0047***   |
|           | (–1.60)      | (–2.37)      | (–2.52)      | (–2.67)      |
| CSR_Q4,2019 | –0.0370***  | –0.0969***   | –0.1264***   | –0.1264***   |
|           | (–4.21)      | (–5.37)      | (–5.87)      | (–6.46)      |
| HX_CSR,2018  |             | –0.0019***   | –0.0047***   | –0.0047***   |
| Controls  | Yes          | Yes          | Yes          | Yes          |
| Industry FE | Yes          | Yes          | Yes          | Yes          |
| N         | 3013         | 3013         | 3013         | 3013         |
| Adj R²    | 0.0618       | 0.1115       | 0.0727       | 0.1231       |

In Columns (1) and (2) of this table, we use dummy variables for CSR quartiles to alternatively measure CSR engagement and re-estimate the baseline model in Eq. (1). Specifically, we divided sample firms into quartiles based on firms’ 2019 Hexun CSR scores (HX_CSR,2019). CSR_Q2,2019 equals 1 if firm i is in the second quartile and 0 otherwise. CSR_Q3,2019 equals 1 if firm i is in the third quartile and 0 otherwise. CSR_Q4,2019 equals 1 if firm i is in the fourth quartile and 0 otherwise. Columns (3) to (4) use firms’ 2018 Hexun CSR scores as the main dependent variable. Control variables in this table are identical to those in Table 2. All variables are defined in detail in the Appendix. Industry fixed effects are included in all regressions. T-statistics reported in parentheses are based on robust standard errors. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.

Table 4
Robustness tests: alternative CSR data sources.

| Dep Var= | (1)          | (2)          | (3)          | (4)          | (5)          | (6)          | (7)          | (8)          |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| RKS_CSR,2019 | –0.0014***  | –0.0008**   | –0.0031***   | –0.0016*   | –0.0202***  | –0.0111     | –0.0520***   | –0.0264*   |
|          | (–3.62)      | (–2.01)     | (–3.76)      | (–1.88)     | (–2.97)      | (–1.57)     | (–3.73)      | (–1.84)     |
| CNRDS_CSR,2019 |           |             | –0.0031***   | –0.0016*   | –0.0202***  | –0.0111     | –0.0520***   | –0.0264*   |
| Firm characteristics | No         | Yes         | Yes         | No          | No           | Yes         | Yes          | Yes         |
| Factor loadings    | Yes         | Yes         | Yes         | Yes         | Yes         | Yes         | Yes          | Yes         |
| Industry FE        | Yes         | Yes         | Yes         | Yes         | Yes         | Yes         | Yes          | Yes         |
| N                | 718          | 718          | 718          | 718          | 718          | 718          | 782          | 782          |
| Adj R²            | 0.0702       | 0.1009       | 0.0601       | 0.1419      | 0.0648       | 0.1054      | 0.0571       | 0.1442      |

This table presents the regression results on the baseline model while calculating using two alternative CSR data sources to measure firms’ CSR engagement. RKS_CSR,2019 is firm i’s 2019 CSR score issued by the Running and Loving Consulting for Common Welfare Co.Ltd. (RKS). CNRDS_CSR,2019 is firm i’s 2019 CSR score based on the CSR ratings issued by the Chinese Research Data Services (CNRDS). The full set of control variables and industry fixed effects are included in all columns. T-statistics reported in parentheses are based on robust standard errors. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.

Both RKS and CNRDS rely on firms’ self-disclosed annual CSR reports to evaluate their CSR practices. Less than 800 Chinese firms disclosed their 2019 CSR reports as the disclosure of such reports is voluntary rather than mandatory for the majority of Chinese firms. Accordingly, less than 800 observations are used in Table 4. Both alternative CSR measures are negatively related to the crisis-period stock returns in all columns of Table 4, and the relationship is statistically significant in most columns. These results provide evidence of the robustness of our finding in Table 2. That is, Chinese firms with more pre-crisis CSR engagement suffer from larger stock price declines during the crisis.

4.2.3. Alternative crisis period

In Table 2, we set January 23 to March 31, 2020 as the COVID-19 crisis period in the Chinese stock market. To further check the robustness of the findings in Table 2, we employ an alternative crisis period in this Section and re-estimate the baseline model. Most provinces of China entered into “lockdown” after January 23, 2020 due to the widely spread of the COVID-19 cases. Thanks to the prompt interventions, new cases decreased rapidly in late February. On March 12, the Joint Prevention and Control Mechanism of the State Council in China stated in a press release that the peak of the pandemic had passed. Based on this statement, we alternatively set January 23 to March 12, 2020 as the crisis period in this Section.

Table 5 reports the baseline model regression results while calculating RawRet_crisis and CAR_crisis with the alternative crisis period.
Table 5  
Alternative crisis period.

| Dep Var | RawRet\_\text{crisis} | CAR\_\text{crisis} | RawRet\_\text{crisis} | CAR\_\text{crisis} |
|---------|----------------------|------------------|----------------------|------------------|
| HX\_CSR\_2019 | 0.0017*** | 0.0036*** | 0.0053 | 0.0155 |
| CSR\_Q2\_2019 | -0.0071 | -0.0417*** | (-3.87) | (-7.36) |
| CSR\_Q3\_2019 | 0.0036*** | 0.0675*** | (-3.33) | (-6.69) |
| CSR\_Q4\_2019 | -0.0294*** | -0.0675*** | (-3.33) | (-6.69) |
| Controls | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes |
| N | 3013 | 3013 | 3013 | 3013 |
| Adj R² | 0.0527 | 0.2293 | 0.0519 | 0.2255 |

This table presents the regression results on the baseline model while alternatively setting January 23 to March 12, 2020 as the crisis period. The full set of control variables and industry fixed effects are included in all columns. T-statistics reported in parentheses are based on robust standard errors. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.

Similar to the results in Table 2, the results in Table 5 suggest a significantly negative impact of Chinese firms’ pre-crisis CSR performance on their stock returns during the alternative crisis period. Again, these results support that the negative impact found in Table 2 is robust.9

4.2.4. Excluding industries particularly affected by the COVID-19 pandemic

Following Garel and Petit-Romec (2021), we further check the robustness of our finding in Table 2 by verifying that it is not driven by specific industries particularly affected by the COVID-19 pandemic. Specifically, we re-estimate the baseline model while excluding firms in the transportation, information technology, pharmaceutical, or service industry. Chinese firms in the transportation and service industries severely suffer from the national lockdown during the COVID-19 crisis. In contrast, the information technology industry may benefit from the “working from home” orders, and the pharmaceutical industry may benefit from urgent demands for medical supplies.

Table 6 presents the results of our baseline regressions while excluding specific industries. The coefficients of HX\_CSR\_2019 are negative with a 1% significance level in all columns. These results show that our finding in Table 2 is not driven by specific industries particularly affected by the COVID-19 crisis. That is, the negative relationship between Chinese firms’ pre-crisis CSR engagement and their crisis-period stock returns is robust to the influence of specific industries.

4.2.5. The difference-in-differences approach

Previous sections show that CSR negatively impacts stock returns during the COVID-19 crisis for Chinese firms. We interpret the finding as evidence that Chinese investors view CSR as a costly overinvestment that significantly harms firm value during the crisis period. However, it is possible that the negative impact is not unique to the crisis period and is caused by unobservable risk factors constantly related to CSR. If so, we should observe a negative relationship between Chinese firms’ pre-crisis CSR engagement and stock returns in normal periods as well.

Following Lins et al. (2017), we employ a difference-in-differences model to test this possibility. Specifically, we construct a panel of observations for our sample firms starting in 2019 and ending in 2020. We then estimate the following model:

\[
R_{w} = \alpha + \beta_{1} \text{HX}_{CSR,2019} \times DCrisis_{w} + \beta_{2} \text{HX}_{CSR,2019} \times DPostCrisis_{w} + \sum Controls + FirmFE + WeekFE + IndustryFE + \epsilon _{w} 
\]

where \(R_{w}\) are the weekly raw or market-model adjusted returns, and the primary variable of interest is the firm’s 2019 HX CSR score (\(\text{HX}_{CSR,2019}\)). Weekly firm and market returns over the previous 12 months are used to estimate the market model. \(DCrisis_{w}\) indicates the crisis period and is a dummy set to 1 for weeks from January 23 to March 31, 2020. \(DPostCrisis_{w}\) indicates the post-crisis period and is a dummy set to 1 from April 1 to December 31, 2020. The two dummies split the panel into three subperiods. The pre-crisis period stands for normal periods and is set to be the base period in Eq. (2). The coefficient of \(\text{HX}_{CSR,2019} \times DCrisis_{w}\) implies the marginal impact of CSR during the crisis relative to that during normal periods, while the coefficient of \(\text{HX}_{CSR,2019} \times DPostCrisis_{w}\) indicates whether the impact persists or reverses during the post-crisis period.

The control variables in Eq. (2) are the firm characteristics and factor loadings used in Table 2. The firm characteristics based on accounting data are updated quarterly. Firms’ past returns (\(HRet\)), idiosyncratic risk (\(IV\)), and factor loadings are calculated with monthly stock returns over the previous 60 months and are updated monthly. Finally, we include firm, week, and industry fixed effects.

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9 In addition, untabulated tests suggest that our main findings are robust while measuring firms’ CSR performance with their 2018 CSR scores and contemporaneously setting January 23 to March 12, 2020 as the crisis period.
Table 6
Robustness tests: controlling for the influence of specific industries.

| Industries excluded | Panel A DepVar = RawRet\textsubscript{crisis} | Panel B DepVar = CAR\textsubscript{crisis} |
|---------------------|---------------------------------------------|---------------------------------------------|
|                     | (1)  | (2)  | (3)  | (4)  | (5)  | (6)  | (7)  | (8)  |
| Transportation      |      |      |      |      |      |      |      |      |
| Information Technology |      |      |      |      |      |      |      |      |
| Pharmaceutical      |      |      |      |      |      |      |      |      |
| Service             |      |      |      |      |      |      |      |      |
| HX\textsubscript{CSR,2019} | -0.0020\textsuperscript{***} | -0.0022\textsuperscript{***} | -0.0020\textsuperscript{***} | -0.0021\textsuperscript{***} | -0.0052\textsuperscript{***} | -0.0056\textsuperscript{***} | -0.0051\textsuperscript{***} | -0.0054\textsuperscript{***} |
|                     | (-4.65) | (-4.62) | (-4.62) | (-4.73) | (-5.82) | (-5.71) | (-5.53) | (-5.84) |
| Controls            | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  |
| Industry FE         | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  |
| N                   | 2927 | 2487 | 2798 | 2851 | 2927 | 2487 | 2798 | 2851 |
| Adj R\textsuperscript{2} | 0.0609 | 0.0722 | 0.0613 | 0.0670 | 0.1135 | 0.1398 | 0.1099 | 0.1163 |

This table presents the baseline model regression results for subsamples excluding firms in the transportation industry, the information technology industry, the pharmaceutical industry, or the service industry. RawRet\textsubscript{crisis} and CAR\textsubscript{crisis} are used as the dependent variable in Panels A and B, respectively. The independent variable of main interest is firm \(i\)'s 2019 Hexun CSR score (HX\textsubscript{CSR,2019}). The full set of control variables and industry fixed effects are included in all columns. All variables are defined in detail in the Appendix. T-statistics reported in parentheses are based on robust standard errors. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.
in Eq. (2) to control for time-invariant omitted risk factors. $HX_{CSR,2019}$ does not appear in Eq. (2) since it is absorbed by the firm fixed effects, and the two dummies are absorbed by the week fixed effects.

Table 7 presents the results of estimating the panel regression model in Eq. (2). The coefficient of $HX_{CSR,2019} \times DCrisis_{w}$ is negative with a 1% significance level in all settings. These results indicate that CSR significantly and negatively impacts crisis-period stock returns after considering its possible impact during normal periods. The sign and significance level of the coefficients of $HX_{CSR,2019} \times DPostCrisis_{w}$ are inconsistent across the columns in Table 7. Besides, those coefficients are small in magnitude relative to those of $HX_{CSR,2019} \times DCrisis_{w}$. In summary, Table 7 shows that the negative impact of CSR is unique to the crisis period and does not reverse during the post-crisis period, supporting the robustness of our findings in Table 2. Also, the results imply that the impact is related to firms’ intrinsic value rather than caused by investors’ temporary panic, suggesting that firms’ CSR engagement can be predictive of their resilience in the crisis, which we will discuss in Section 5.3.

5. Further analyses

5.1. The role of agency problems

We find a robust and negative relationship between Chinese firms’ pre-crisis CSR engagement and their stock returns during the COVID-19 crisis, consistent with the agency theory. Specifically, the theory states that agency problems motivate managers to overinvest in CSR for their own interests. If so, the overinvestment may deteriorate firms’ financial conditions after the COVID-19 pandemic unexpectedly broke out. Since financial flexibility is vital for firms to survive and recover from the pandemic (Fahlenbrach et al., 2021), the pandemic shows larger negative effects on firms with higher pre-crisis CSR engagement. If this argument holds, it should be observed that the negative impact of CSR on crisis-period returns is more pronounced for firms with more agency problems.

We use a subsample approach to test this prediction. Specifically, we split our sample into subsamples based on measures of agency problems. We then estimate our baseline model separately in each subsample and compare the regression coefficients across the subsamples. We measure agency problems from three perspectives: ownership concentration, institutional ownership, and CEO duality. First, typical principal-agency problems between shareholders and managers arise due to the separation of control and ownership. The separation is larger for firms with less concentrated ownership, suggesting that such firms are associated with more agency problems (Firmuc et al., 2006). Second, institutional investors are globally important external monitors of public firms. Firms with less institutional ownership are likely to suffer from more agency problems (Aggarwal et al., 2011). Finally, CEOs who also chair the board face less internal monitoring of their rent-seeking or opportunistic behaviors, implying more severe agency conflicts.

Table 8 presents the results of testing the role of agency problems. In Panel A, we divide our sample firms into terciles based on their ownership concentration measured at year-end 2019. We measure the ownership concentration as the Herfindahl-Hirschman Index of the share percentages of the firm’s top ten shareholders. As shown in Panel A, the negative relationship is more pronounced in the subsample of firms with less ownership concentration. We also formally test the differences in regression coefficients on $HX_{CSR,2019}$ between the top and bottom terciles and report the $p$-values in brackets. The tests show that the negative impact of CSR on both raw and cumulative abnormal returns is significantly larger for firms in the bottom decile.

In Panel B, we divide our sample firms into terciles based on their institutional ownership measured at year-end 2019. As shown in Columns (1) to (3), the negative impact of CSR on raw stock returns is only statistically significant for firms in the bottom tercile. In Columns (4) to (6) where CAR$_{crisis}$ is used as the dependent variable, the coefficient of $HX_{CSR,2019}$ is always significantly negative.

Table 7
Robustness tests: the difference-in-differences approach.

|                      | (1)          | (2)          | (3)          | (4)          |
|----------------------|--------------|--------------|--------------|--------------|
|                      | RawRet$_{w}$| CAR$_{w}$    | RawRet$_{w}$| CAR$_{w}$    |
| $HX_{CSR,2019} \times DCrisis_{w}$ | -0.0147***   | -0.0331***   | -0.0136***   | -0.0324***   |
|                      | (-3.04)      | (-6.10)      | (-2.70)      | (-5.91)      |
| $HX_{CSR,2019} \times DPostCrisis_{w}$ | 0.0056**    | -0.0114***   | 0.0075*      | -0.0049      |
|                      | (2.25)       | (-2.99)      | (1.95)       | (-1.11)      |
| Controls             | No           | No           | Yes          | Yes          |
| Firm FE              | Yes          | Yes          | Yes          | Yes          |
| Week FE              | Yes          | Yes          | Yes          | Yes          |
| Industry FE          | No           | No           | Yes          | Yes          |
| N                    | 305,511      | 305,395      | 303,655      | 303,655      |
| Adj R$^2$            | 0.2432       | 0.0170       | 0.1469       | 0.0630       |

This table presents the results of estimating the panel regression model in Eq. (2). Firm $i$’s raw returns (RawRet$_{w}$) or market-model adjusted returns (CAR$_{w}$) over week $w$ are used as the dependent variable. Weekly firm and market returns over the previous 12 months are used to estimate the market model. DCrisis$_{w}$ equals 1 for the COVID-19 crisis period from January 23 to March 31, 2020 and 0 otherwise. DPostCrisis$_{w}$ equals 1 for the post-crisis period from April 1 to December 31, 2020, and 0 otherwise. Firm characteristics and factor loadings are identical to those employed in Table 2. Firm characteristics based on accounting data are updated at each quarter-end. $HRet$, $IV$, and factor loadings are updated monthly. Firm and week fixed-effects are included in all regressions. Industry fixed effects are included in columns (3) and (4). All variables are defined in detail in the Appendix. T-statistics reported in parentheses are based on robust standard errors. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.
Nevertheless, the coefficient in the bottom tercile is the largest in magnitude. Also, the tests on the differences in coefficients suggest that CSR exhibits significantly larger negative impacts on both raw and abnormal returns for firms with less institutional ownership.

In Panel C, we split our sample firms into two subsamples depending on whether their CEOs also chair the board. Although the coefficient of $H_{X,CSR}^{2019}$ is significantly negative in all columns, it is always larger in magnitude for firms of which CEOs also chair the board. For example, the coefficient in Column (3) is $0.0030$, which is about two times that ($0.0017$) in Column (4). Meanwhile, the P-value below (0.093) suggests that the difference is statistically significant.

In summary, Table 8 shows that the negative impact of CSR on crisis-period stock returns is more pronounced for firms with less concentrated ownership or institutional ownership and firms with CEO duality, i.e., firms with more agency problems. Managers of such firms are more likely to overinvest in CSR for their own good and subsequently face unfavorable financial conditions during the unexpected COVID-19 crisis. Anticipating this, the market more negatively reacted to those firms. That is, the negative impact of firms’ CSR engagement on their crisis-period returns is larger for those firms.

Table 8
Subsample analyses: the role of agency problems.

| Panel A Subsamples based on ownership concentration |
|---------------------------------------------------|
| Tercile= | $DepVar = \text{RawRet}_{crisis}$ | $DepVar = \text{CAR}_{crisis}$ |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Top | Medium | Bottom | Top | Medium | Bottom | Top | Medium | Bottom |
| $H_{X,CSR}^{2019}$ | $-0.0006$ | $-0.0018^{**}$ | $-0.0028^{***}$ | $-0.0023$ | $-0.0049^{***}$ | $-0.0068^{***}$ |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| (Top-Bottom) coefficient | 0.0022$^{**}$ | 0.0045$^{**}$ | | | | |
| P-value | [0.018] | [0.014] | | | | |
| N | 1005 | 1005 | 1003 | 1005 | 1005 | 1003 |
| Adj $R^2$ | 0.0656 | 0.0448 | 0.0377 | 0.1189 | 0.1019 | 0.0940 |

| Panel B Subsamples based on institutional ownership |
|---------------------------------------------------|
| Tercile= | $DepVar = \text{RawRet}_{crisis}$ | $DepVar = \text{CAR}_{crisis}$ |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Top | Medium | Bottom | Top | Medium | Bottom | Top | Medium | Bottom |
| $H_{X,CSR}^{2019}$ | $-0.0007$ | $-0.0011$ | $-0.0038^{***}$ | $-0.0025^{*}$ | $-0.0035^{**}$ | $-0.0083^{***}$ |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| (Top-Bottom) coefficient | 0.0031$^{***}$ | 0.0058$^{***}$ | | | | |
| P-value | [0.000] | [0.006] | | | | |
| N | 1006 | 1003 | 1004 | 1006 | 1003 | 1004 |
| Adj $R^2$ | 0.0697 | 0.0370 | 0.0461 | 0.1171 | 0.0846 | 0.1095 |

| Panel C Subsamples based on CEO duality |
|----------------------------------------|
| $DepVar = \text{RawRet}_{crisis}$ | $DepVar = \text{CAR}_{crisis}$ |
| CEO duality | (1) Yes | (2) No | (3) Yes | (4) No |
| $H_{X,CSR}^{2019}$ | $-0.0069^{***}$ | $-0.0046^{***}$ | $-0.0030^{***}$ | $-0.0017^{***}$ |
| (Yes- No) coefficient | $-0.0017$ | $-0.0013^{*}$ | $-0.0013^{*}$ | $-0.0013^{*}$ |
| P-value | [0.107] | [0.093] | [0.093] | [0.093] |
| Controls | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes |
| N | 869 | 2104 | 869 | 2104 |
| Adj $R^2$ | 0.0497 | 0.0698 | 0.1269 | 0.1136 |

In this table, we divide our sample into subsamples based on firms’ ownership concentration, institutional ownership, and CEO duality in Panels A, B, and C, respectively. We then re-estimate the baseline model in Eq. (1) for those subsamples and compare the regression coefficients on $H_{X,CSR}^{2019}$. CEO duality indicates that the firm’s CEO also chairs the board. Institutional ownership is the percentage of shares owned by institutional investors at the end of 2019. Ownership concentration is measured as the Herfindahl-Hirschman Index of the share percentages of the firm’s top ten shareholders. The set of control variables is identical to that in Table 2. All variables are defined in detail in the Appendix. Industry fixed effects are included in all regressions. T-statistics reported in parentheses are based on robust standard errors. P-values of the tests on the difference in the regression coefficients on $H_{X,CSR}^{2019}$ are reported in brackets. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.

Nevertheless, the coefficient in the bottom tercile is the largest in magnitude. Also, the tests on the differences in coefficients suggest that CSR exhibits significantly larger negative impacts on both raw and abnormal returns for firms with less institutional ownership.

In Panel C, we split our sample firms into two subsamples depending on whether their CEOs also chair the board. Although the coefficient of $H_{X,CSR}^{2019}$ is significantly negative in all columns, it is always larger in magnitude for firms of which CEOs also chair the board. For example, the coefficient in Column (3) is $-0.0030$, which is about two times that ($-0.0017$) in Column (4). Meanwhile, the P-value below (0.093) suggests that the difference is statistically significant.

In summary, Table 8 shows that the negative impact of CSR on crisis-period stock returns is more pronounced for firms with less concentrated ownership or institutional ownership and firms with CEO duality, i.e., firms with more agency problems. Managers of such firms are more likely to overinvest in CSR for their own good and subsequently face unfavorable financial conditions during the unexpected COVID-19 crisis. Anticipating this, the market more negatively reacted to those firms. That is, the negative impact of firms’ CSR engagement on their crisis-period returns is larger for those firms.
5.2. The role of financial conditions

We further test the role of firms’ financial conditions on the impact of CSR. If CSR causes stock price declines during the crisis by deteriorating firms’ financial conditions, the effect should be more pronounced for firms with less access to external financing during the crisis or worse pre-crisis financial conditions.

We consider firms’ financing access and financial conditions from three perspectives: state ownership, the sign of net cash flow, and the ratio of net cash flow to capital expenditure. First, the financial system in China is largely state-dominated and favors state-owned enterprises (SOEs). Formal financing, such as bank lending, is significantly less available for non-SOEs than for SOEs (Allen et al., 2005; Wu et al., 2014). Due to less access to external financing, Chinese non-SOEs may face worse financial conditions during the crisis if they overinvest in CSR before the crisis. Second, the firm’s cash flow is vital for its survival during an unexpected crisis if it does not access external financing (Huang and Ritter, 2021). Intuitively, firms with negative pre-crisis net cash flow are more likely to suffer from the crisis than those with positive net cash flow. Thus, the CSR engagement may cause larger stock price declines during the crisis for such firms. Finally, capital expenditures are costly and sticky. Firms with more capital expenditures are more challenging to cut spending (Fahlenbrach et al., 2021). Accordingly, firms face worse financial conditions during the crisis if their net cash flow does not cover their capital expenditures, i.e., the ratio of net cash flow to capital expenditure is less than 1. We expect that the CSR engagement of such firms shows a larger impact on their crisis-period stock returns.

Table 9 presents the regression results on subsamples divided by the abovementioned proxies. In Panel A, we split firms into SOEs

|                  | DepVar = RawRet_{crisis} |                 | DepVar = CAR_{crisis} |                 |
|------------------|--------------------------|------------------|-----------------------|------------------|
|                  | (1) Yes                  | (2) No           | (3) Yes               | (4) No           |
| **HX_CSR_{2019}**| -0.0002                  | -0.0028***      | -0.0015               | -0.0065***      |
| (Yes- No)        | (-0.24)                  | (-5.28)         | (-0.94)               | (-6.03)         |
| coefficient      | 0.0026***                | 0.0050***       |                       |                  |
| P-value          | [0.004]                  |                  | [0.007]               |                  |
| Controls         | Yes                      | Yes             | Yes                   | Yes             |
| Industry FE      | Yes                      | Yes             | Yes                   | Yes             |
| N                | 954                      | 2059            | 954                   | 2059            |
| Adj R^2          | 0.1068                   | 0.0482          | 0.1492                | 0.1073          |

In this table, we divide our sample into subsamples based on variables related to firms’ financial conditions. In Panel A, we divide our sample into SOEs and non-SOEs. In Panel B, we divide our sample depending on whether the firm received positive net cash flow in 2019. In Panel C, we divide our sample depending on whether the firm’s ratio of net cash flow to capital expenditure is no less than 1 in 2019. We then re-estimate the baseline model in Eq. (1) for those subsamples and compare the regression coefficients on HX_CSR_{2019}. Industry fixed effects are included in all regressions. Control variables are identical to those employed in Table 2. All variables are defined in detail in the Appendix. T-statistics reported in parentheses are based on robust standard errors. P-values of the tests on the difference in the regression coefficients on HX_CSR_{2019} are reported in brackets. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.
and non-SOEs. The results suggest that the impact of CSR on raw stock returns or cumulative abnormal stock returns is only significantly negative for non-SOEs. The P-values below provide further evidence that the negative impact of CSR on the crisis-period stock returns is larger for the subsample consisting of non-SOEs.

In Panel B, we partition the sample into two subsamples depending on whether the firm received positive net cash flow observed at year-end 2019. While the coefficient of $HX_{CSR, 2019}$ is significantly negative in all columns, the tests on the differences in regression coefficients on $HX_{CSR, 2019}$ suggest that the negative impact is always significantly larger for firms with negative net cash flow. For example, the coefficient is $-0.0045$ for firms with positive net cash flow in Column (3) and is $-0.0084$ for firms with negative net cash flow in Column (4). According to the P-value, the difference is statistically significant at the 10% level.

In Panel C, we divide the sample into two parts depending on whether the firm’s ratio of net cash flow to capital expenditure is no less than 1. Again, the coefficients of $HX_{CSR, 2019}$ are significantly negative in all columns, implying the market-wide negative impact of CSR on crisis-period stock returns. Still, the magnitude of the coefficients is always larger in magnitude for the subsample of firms in which the ratio of net cash flow to capital expenditure is less than 1. The differences in regression coefficients on $HX_{CSR, 2019}$ between the two subsamples are also statistically significant. Specifically, the difference is 0.0018 (0.0030) with a significance level of 5% (10%) when using raw (cumulative abnormal) returns as the dependent variable.

To summarize, the CSR engagement causes larger declines in crisis-period stock prices for Chinese firms that are non-SOEs, receive negative net cash flow or have net cash flow smaller than their capital expenditures. Since those firms have less access to external financing or worse pre-crisis financial conditions, the results further support that the costly CSR engagement may decrease crisis-period stock returns by deteriorating the firm’s financial conditions.

5.3. Impact of CSR engagement on operating performance

The results of the DID model in Table 7 show that the negative impact of CSR does not reverse during the post-crisis period, implying that the impact is permanent and may be predictive of firms’ future performance. This is consistent with our argument that the costly CSR investment harms the firm’s financial conditions and then deteriorates firm performance. To formally test this argument, we estimate the following model over the period 2019–2020 and study the impact of the CSR engagement on operating performance:

$$ Per_{i,q} = \alpha + \beta_1 HX_{CSR, 2019} \times Crisis_{i,q} + \beta_2 HX_{CSR, 2019} \times PostCrisis_{i,q} + \Sigma Controls + FirmFE + \text{Quarter}FE + \epsilon_{i,q} $$

where $Per_{i,q}$ denotes the measures for operating performance. Following the study of Lins et al. (2017), we measure the firm’s performance as its profitability ($Profit_{i,q}$), gross margin ($GMargin_{i,q}$), and return on assets ($ROA_{i,q}$). $Profit_{i,q}$ is calculated as operating income divided by assets; $GMargin_{i,q}$ is measured as the difference between sales and cost of goods sold divided by sales, while $ROA_{i,q}$ is net income divided by assets. $Crisis_{i,q}$ equals 1 for the crisis period, i.e., the first quarter of 2020, and 0 otherwise. Accordingly, $PostCrisis_{i,q}$ equals 1 for the post-crisis period from the second to the fourth quarter of 2020 and 0 otherwise. Similar to Lins et al. (2017), we control for the firm’s log of total assets ($Log(assets)_{i,q}$) in Eq. (3). Additionally, firm and quarter fixed effects are included in Eq. (3) to control for unobservable firm characteristics and the variation in firm performance over time.

As shown in Table 10, the interaction term between $HX_{CSR, 2019}$ and the crisis-period dummy is negatively related to $Profit_{i,q}$.

Table 10

| Impact of CSR on operating performance. | (1) | (2) | (3) |
|----------------------------------------|-----|-----|-----|
| $HX_{CSR, 2019} \times Crisis_{i,q}$ | $-0.0011^{**}$ | $-0.0016^{***}$ | $-0.0015^{***}$ |
|                                           | ($-2.52$) | ($-3.99$) | ($-15.87$) |
| $HX_{CSR, 2019} \times PostCrisis_{i,q}$ | $-0.0017^{***}$ | $-0.0010^{***}$ | $-0.0002$ |
|                                           | ($-4.64$) | ($-2.90$) | ($-1.08$) |
| $Log(assets)_{i,q}$ | $-0.0248$ | $0.0425^{***}$ | $0.0616^{***}$ |
|                                           | ($-1.43$) | ($3.64$) | ($7.18$) |
| Constant | $0.6994^{*}$ | $-0.6476^{**}$ | $-1.3655^{***}$ |
|                                           | (1.81) | ($-2.49$) | ($-7.13$) |
| Firm FE | Yes | Yes | Yes |
| Quarter FE | Yes | Yes | Yes |
| N | 24,103 | 24,103 | 24,104 |
| Adj R$^2$ | 0.5332 | 0.0202 | 0.1194 |

In this table, we regress the model shown in Eq. (3) to investigate the impact of firms’ 2019 CSR scores on their crisis and post-crisis period operating performance. The sample period in this table is from 2019 to 2020. $HX_{CSR, 2019}$ is firm i’s 2019 CSR score issued by Hexun.com. $Crisis_{i,q}$ equals 1 for the first quarter of 2020 and 0 otherwise. $PostCrisis_{i,q}$ equals 1 for the second to the fourth quarter of 2020 and 0 otherwise. $Log(assets)_{i,q}$ is the log of total assets. $Profit_{i,q}$ is the ratio of operating income to assets. $GMargin_{i,q}$ is firm i’s gross margin calculated as (sales-cost of goods sold)/sales over quarter q. $ROA_{i,q}$ is firm i’s net earnings divided by assets over quarter q. Firm and quarter fixed effects are included in all regressions. T-statistics reported in parentheses are based on standard errors clustered at the firm level. *, **, and *** denote the significance level of 10%, 5%, and 1%, respectively.
economic significance. A one-standard-deviation increase in engagement exhibits significantly less operating income, lower gross margins, and lower return on assets. The impact of CSR is also of

Appendix A. Appendix variable definitions

| Variable                | Definition                                                                 |
|-------------------------|----------------------------------------------------------------------------|
| RawRet$_{\text{crisis}}$ | The raw stock return on stock $i$ over the COVID-19 crisis period from January 23 to March 31, 2020. |
| RawRet$_{\text{w}}$       | The raw stock return on stock $i$ over week $w$.                             |
| CAR$_{\text{crisis}}$     | The market model-adjusted cumulative abnormal return on stock $i$ over the COVID-19 crisis period from January 23 to March 31, 2020. |
| CAR$_{\text{w}}$          | The market model-adjusted cumulative abnormal return on stock $i$ over week $w$. |
| $\text{HXR}_{\text{CSR},2019}$ | Firm $i$’s 2019 CSR score issued by Hexun.com.                             |
| $\text{RKS}_{\text{CSR},2019}$ | Firm $i$’s 2019 CSR score issued by Running and Loving Consulting for Common Welfare Co.Ltd. |
| CNRDS$_{\text{CSR},2019}$ | Firm $i$’s 2019 CSR score based on the CSR ratings issued by the Chinese Research Data Services (CNRDS). |
| IV$_{\text{w}}$            | The residual variance obtained from the regression of firm $i$’s monthly returns on market returns over 60 months ending in December 2019. |
| HRet$_{\text{w}}$          | The raw stock return on firm $i$ over the previous 12 months ending in December 2019. |
| Ln(MV)$_{\text{w}}$        | The natural logarithm of firm $i$’s market capitalization (in Chinese Yuan) at the end of 2019. |
| Profit$_{\text{w}}$       | Firm $i$’s operating income divided by assets at the end of 2019.            |
| BM$_{\text{w}}$            | Firm $i$’s book value divided by its market value at the end of 2019.        |
| SDebt$_{\text{w}}$        | Firm $i$’s debt in current liabilities divided by assets at the end of 2019. |
| LDebt$_{\text{w}}$        | Firm $i$’s long-term debt divided by assets at the end of 2019.              |
| Cash$_{\text{w}}$         | Firm $i$’s cash and marketable securities divided by assets at the end of 2019. |
| Beta$_{\text{MKT},2019}$  | The loading on the market premium based on the Fama-French three-factor model plus the momentum factor estimated over 60 months ending in December 2019. |
| Beta$_{\text{SIZE},2019}$ | The loading on the size premium based on the Fama-French three-factor model plus the momentum factor estimated over 60 months ending in December 2019. |
| Beta$_{\text{BM},2019}$   | The loading on the book-to-market premium based on the Fama-French three-factor model plus the momentum factor estimated over 60 months ending in December 2019. |

6. Conclusion

Using the COVID-19 pandemic as an exogenous shock to investors’ demand for CSR, we study whether CSR enhances or harms the value of Chinese firms during the crisis. We find that Chinese firms with more pre-crisis CSR engagement are associated with lower crisis-period stock returns. Further tests show that the negative impact of CSR on stock returns is more pronounced for firms with more agency problems, less access to external financing, or worse pre-crisis financial conditions. Besides, firms with more pre-crisis CSR engagement exhibit poorer operating performance during both the crisis and the post-crisis period. The agency theory, which states that managers are motivated to overinvest in CSR for their self-interests, offers possible explanations. The overinvestment in CSR may deteriorate firms’ financial conditions after the COVID-19 crisis unexpectedly broke out and impede firms’ recovery from the crisis. Accordingly, the crisis caused larger stock price declines for firms with more pre-crisis CSR engagement.

Our findings are inconsistent with related studies on developed countries such as America, implying that the driving forces and economic outcomes of CSR practices in emerging markets such as China may significantly differ from those in developed countries. Therefore, we contribute to the intense debate on the relationship between CSR and firm value. Our study also adds to the fast-growing research on the determinants of stock returns during the global COVID-19 pandemic. Specifically, the results in our study suggest that the deterioration of firms’ financial conditions caused by their overinvestment in CSR may harm firm value during the pandemic.

CRediT authorship contribution statement

Yuyang Yi: Software, Data curation, Formal analysis, Writing – original draft. Zongyi Zhang: Resources, Conceptualization. Cheng Xiang: Methodology, Writing – review & editing, Investigation, Validation.

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Appendix A. Appendix variable definitions

(continued on next page)
| Variable                      | Definition                                                                 |
|-------------------------------|-----------------------------------------------------------------------------|
| Beta MOM2019                  | The loading on the book-to-market premium based on the Fama-French three-factor model plus the momentum factor estimated over 60 months ending in December 2019. |
| CSR Q2,2019                   | Dummy that equals 1 if firm i is in the second HX CSR,2019 quartile and 0 otherwise. |
| CSR Q3,2019                   | Dummy that equals 1 if firm i is in the third HX CSR,2019 quartile and 0 otherwise. |
| CSR Q4,2019                   | Dummy that equals 1 if firm i is in the fourth HX CSR,2019 quartile and 0 otherwise. |
| Delta Crisis_q                | Dummy that equals 1 for weeks over the COVID-19 crisis period from January 23 to March 31, 2020 and 0 otherwise. |
| Delta Post Crisis_q           | Dummy that equals 1 for weeks over the COVID-19 post-crisis period from April 1 to December 31, 2020 and 0 otherwise. |
| Profit_q                      | Firm i’s operating income divided by assets at the end of quarter q.         |
| GMargin_q                     | Firm i’s gross margin calculated as (sales-cost of goods sold)/sales over quarter q. |
| ROA_q                         | Firm i’s net earnings divided by assets over quarter q.                      |
| Crisis_q                      | Dummy that equals 1 for the first quarter of 2020 and 0 otherwise.          |
| Post Crisis_q                 | Dummy that equals 1 for the second to the fourth quarter of 2020 and 0 otherwise. |
| Log(assets)_t,q               | The natural logarithm of firm i’s total assets at the end of quarter q.     |

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