Restart economy in a resilient way: The value of corporate social responsibility to firms in COVID-19

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ABSTRACT

This paper investigates the importance of corporate social responsibility (CSR) to firms in COVID-19. Using data from listed companies in China, we find that a high-level of CSR is conducive to improving stock returns. Importantly, the mechanism analysis shows that corporate social responsibility can bring social trust capital to enterprises, and it can improve the corporate performance during the epidemic. Additional tests show that the impacts of employee protection and environmental protection responsibilities on stock returns are even more significant. Our findings reveal the importance of the socially responsible investing and have important policy implications.

1. Introduction

The stock market is an indispensable part of the capital market. It has been playing a crucial role in optimizing resource allocation, broadening financing channels, and diversifying market risks. The spread of the COVID-19 pandemic has caused a significant impact on the financial markets in a short time (Wang et al., 2020), resulting in severe fluctuations in the stock market. Excessive volatility is not conducive to the stock market's functioning and harms investors, listed companies, and the national interest. However, we observed that the stock prices of some companies, such as China State Construction Engineering Corporation, Ping An Insurance (Group) Company of China, Ltd and China Vanke Co., Ltd., dropped by −3.78%, −3.02%, and −5.29%, respectively within a week after the outbreak. These were far less than the declines of −6.55%, −4.86%, and −7.46% in the industry. There is an obvious similarity among these companies that each of them has a high level of corporate social responsibility (CSR). Is it just a coincidence, or is there a logical necessity? This phenomenon aroused our curiosity. To be concrete, whether the more a company undertakes CSR, the more stable its stock price will be in the face of significant public emergencies, and the more it will be able to withstand external shocks?

It is meaningful to explore this question. With the impact of the epidemic on social and economic development, large-scale economic stimulus plans have been implemented worldwide, and a large amount of funding has been injected into firms to help them fight against the COVID-19. According to statistics from the International Monetary Organization in January 2021, the global financial support has reached nearly $14 trillion to help businesses and families cope with the COVID-19. In this event, the problem worth considering for the time being is to explore a better mode of development for firms, support firms in improving their business

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strategies, and maintain the stability of the financial market (Brammer et al., 2020). The research on CSR and stock market stability in this paper could be helpful to shed light on firm's recovery path after the epidemic. And also, this may help increase the resilience of financial markets to deal with similar major emergencies in the future.

Besides that, the research of this paper also has specific academic significance. At present, the existing relevant studies are mainly aimed at enterprises in specific industries, and there are relatively few discussions on their mechanisms and different types of social responsibility (Qiu et al., 2021; Zhai et al., 2021). Based on the summary of relevant research, as an indirect profit-making behavior, corporate social responsibility can produce two opposite effects on the level of stock returns during the COVID-19. One argument is that according to the stakeholder theory, the development of an enterprise cannot be separated from the participation of all stake-holders, and the enterprise pursues the interests of stakeholders rather than just those of shareholders (Dyck et al., 2019; Bardos et al., 2020; Broadstock et al., 2021; Gloßner, 2019; Qiu et al., 2021; Gregory et al., 2014; Jahmane and Gaies, 2020; Servaes and Tamayo, 2013; Ding et al., 2021). Thus, a high level of social responsibility is conducive to improving stock returns, and both shareholders and society should pay attention to social responsibility in the recovery process. Another argument is that corporate social responsibility is only a manifestation of the principal-agent conflict arising between shareholders and managers. The fulfillment of social responsibility by managers will be beneficial to themselves but detrimental to shareholders' interests (Carroll, 1979; Masulis and Reza, 2015; Jensen, 2001). In this case, undertaking corporate social responsibility is ineffective in enhancing corporate performance in the financial market. Given this, can corporate social responsibility support firms in maintaining their stability in the financial market? Can we take advantage of the COVID-19 pandemic to carry out social responsibility transformation, and "responsibility recovery" for a more sustainable economy? The search for the solution to these issues is crucial to the sustainable development of the economy.

Actually, it is believed that the COVID-19 pandemic presents an opportunity to validate the value of corporate social responsibility in an unusual way. First, the COVID-19 pandemic is an exogenous shock stemming from public health concerns rather than from economic conditions such as the financial crisis. Second, the unexpected impact demonstrates that firms' ability to make a prompt response to the COVID-19 pandemic is limited, the stock market's reaction is premised mainly on the pre-existing level of corporate social responsibility, which can reduce the endogenous problems to some degree. Herein, the social responsibility of firms and the stock returns generated amid the COVID-19 pandemic were explored, based on which the mechanism behind it was analyzed. It is found that corporate social responsibility undertakings are significantly positively correlated with the raw returns and abnormal returns, and this positive correlation is mainly driven by the responsibility for employee protection and environmental protection. The responsibility for public relations has not a significant impact on the stock returns during the epidemic. Mechanism analysis shows that corporate social responsibility can increase social trust capital, and it reveals corporate performance, thus it has a positive impact on the stock returns.

Our study offers several contributions to the literature. First, this paper provides empirical evidence for the value of corporate social responsibility, and indicates the direction of corporate "restructuring" in the wake of the pandemic. Second, this study determines how different types of corporate social responsibility could impact the performance of firms in the financial market, thus enriching the research in the relevant fields (Lins et al., 2017; Ferrell et al., 2016). Lastly, our paper explores the mechanism behind the impact of corporate social responsibility on stock returns, and provides evidence for the economic consequences of corporate social responsibility. Our research can shed light on the follow-up research.

2. Methodology and data

2.1. Methodology

In this paper, the fifth week of 2020 is treated as the event week since the city leader of Wuhan announced the lockdown measures on January 23, 2020, the day before the Spring Festival, which sent shocks to the financial market. The market model method is applied to measure the abnormal return:

$$R_{i,t} = \alpha_0 + \alpha_1 R_{M,t} + \varepsilon \tag{1}$$

Where $R_{i,t}$ indicates the stock return of company i in t trading week, and $R_{M,t}$ denotes the market return at time t. The level of market return is estimated by the window period [- 100, - 10] before the event week. As the price of China's stock market started to recover two months after the event week amid the COVID-19 pandemic, the stock returns one month before and two months after the event week are selected as the sample data for this study. The abnormal return is calculated using model (2):

$$AR_{i,t} = R_{i,t} - \alpha_0 - \alpha_1 R_{M,t} \tag{2}$$

The score achieved by firms in social responsibility is chosen as the major explanatory variable in this paper. Besides, the higher the score, the better the firm performs in fulfilling its social responsibility. Furthermore, the detailed dataset of corporate social responsibility expenditure includes the following categories: shareholder/creditor protection, employee protection, supplier/customer protection, environmental protection, and public relations maintenance. Our focus is placed on the expenditure directed at employee protection, environmental preservation, and public relations maintenance, which is because these categories go beyond legal and regulatory requirements. It is worth noting that the change to corporate social responsibility is a slow process (Guiso et al., 2004). The rapid spread of the COVID-19 pandemic suggests that the capability of firms to make a timely response is very limited, and the reaction of the stock market mainly relies on the pre-existing level of corporate social responsibility. Considering this, the average social responsibility score achieved between 2016 and 2018 is applied in this paper, which can avoid the endogenous problems caused by

Table 1
Variable definitions.

Variables	Definition
raw return	Firm's weekly raw return
abnormal return	Firm's weekly abnormal return
CSR_treatment	Dummy variable: equals zero if the firm's corporate social responsibility score is ranked in the bottom quartile, and one otherwise
curr_liability	Natural logarithm of current liability
fix_ratio	Accounts receivable/Revenue
in_assets	Intangible assets/ Total assets
cash_debt	Net cash flow from operations/10/Debt
inv_return	Return on investment/10
cur_ratio	Current ratio
rec_turnover	Accounts receivable turnover
ROA	Return on assets
Tobin Q	Tobin's Q value
fassets	Natural logarithm of net fixed assets
non_operating	Proportion of non-operating income
inventory	The ratio of inventory to revenue
ass_return	(Total profit + Financial expense)/ Total assets
fixed_margin	Net profit margin on fixed assets
Emp_prot	The amount invested in employee protection / Total assets
Env_prot	The amount invested in environmental protection / Total assets
Don_prot	The amount invested in the maintenance of public relations / Total assets
ove_experience	If the manager has overseas experience, the value is 1; otherwise, the value is 0
mana_shareholder	Shareholding ratio of managers
state_owned	If the firm is state_owned, the value is 1; otherwise, the value is 0
mana_power	If the CEO is the Chairman, the value is 1; otherwise, the value is 0
shareholder_num	The total number of shareholders

Table 2
Descriptive statistics.

Variables	N	Mean	Std. Dev	Minimum	Median	Maximum
raw return (%)	6811	−0.356	6.905	−25.649	−0.752	61.417
abnormal return (%)	6811	−0.234	5.704	−25.307	−0.848	66.187
CSR_score	6811	42.731	13.490	18.442	39.995	89.003
curr_liability	6811	20.807	1.920	12.206	20.911	24.979
fix_ratio	6811	0.188	0.181	0.000	0.138	1.166
In_assets	6811	0.053	0.075	0.000	0.035	0.673
inv_return	6811	0.090	1.375	−13.727	0.007	26.226
cur_ratio	6811	0.151	0.101	0.016	0.131	1.072
rec_turnover	6811	2.257	1.341	−0.154	1.981	10.259
Tobin_Q	6811	1.491	0.859	0.730	1.202	8.887
non_operating	6811	−0.077	1.844	−40.622	0.001	5.242
fassets	6811	21.762	1.802	16.508	21.618	27.279
inventory	6811	0.435	0.882	0.000	0.173	7.711
ass_return	6811	0.044	0.118	−2.095	0.049	0.325

The time range is from January 2020 to March 2020, and the variable is weekly statistical value.

reverse causality to some degree.

The score data of corporate social responsibility is sourced Rankins CSR Ratings (RKS), an authoritative third-party rating agency of corporate social responsibility in China. Other major data is obtained from the CSMAR (Chinese stock market and Accounting Research) database.

Following previous studies (Lins et al., 2017; Qiu et al., 2021), we control for a set of factors from the corporate operational and financial characteristics, including the current liability (*curr_liability*), accounts receivable (*fix_ratio*), etc. The specifications of the variables are described in Table 1.

To investigate the impact of corporate social responsibility on stock returns during the epidemic, we run three sets of regressions. Firstly, we use cross-sectional regressions of corporate weekly stock returns.

$$
\begin{aligned}
Stockperformance_i = {} & \beta_0 + \beta_1 CSR_i + \beta_2\, curr\_liability_i + \beta_3 fix\_ratio_i + \beta_4\, in\_assets_i + \beta_5\, inv\_return_i \\
& + \beta_6\, cur\_ratio_i + \beta_7\, Tobin\_Q_i + \beta_8\, rec\_turnover_i + \beta_9\, fassets_i \\
& + \beta_{10}\, non\_operating_i + \beta_{11}\, inventory_i + \beta_{12}\, ass\_return_i + \varepsilon
\end{aligned}
\tag{3}
$$

Then, we use difference-in-differences (DID) regression to identify the impact better. We construct the following model:

Table 3
The influence of the corporate social responsibility on stock returns.

Variables	(1) raw return	(2) abnormal return	(3) raw return	(4) abnormal return	(5) raw return	(6) abnormal return
CSR_treatment	0.109**	0.068*	−0.360***	−0.402***	−0.394***	−0.427***
	(0.052)	(0.039)	(0.095)	(0.107)	(0.118)	(0.121)
post_COVID			−3.601***	−0.539	−3.717***	−0.656
			(0.523)	(0.468)	(0.486)	(0.439)
CSR_treatment × post_COVID			0.611***	0.602***	0.706***	0.697***
			(0.176)	(0.174)	(0.225)	(0.224)
curr_liability	0.058	0.075*	0.047*	0.066***	0.024	0.049**
	(0.042)	(0.040)	(0.027)	(0.024)	(0.024)	(0.020)
fix_ratio	0.716*	0.786*	0.791*	0.897**	0.866*	0.992**
	(0.386)	(0.441)	(0.413)	(0.451)	(0.449)	(0.466)
in_assets	−0.817***	−0.603*	−0.398	−0.269	−0.370	−0.252
	(0.269)	(0.336)	(0.383)	(0.387)	(0.500)	(0.502)
inv_return	0.215***	0.149***	0.205***	0.140***	0.205***	0.139***
	(0.040)	(0.044)	(0.030)	(0.034)	(0.028)	(0.032)
cur_ratio	−0.131	0.133	−0.283	0.004	−1.144**	−0.686
	(0.315)	(0.319)	(0.315)	(0.367)	(0.458)	(0.422)
rec_ turnover	−0.071	−0.047	−0.081	−0.052	−0.081	−0.048
	(0.049)	(0.055)	(0.054)	(0.057)	(0.055)	(0.057)
Tobin_Q	0.092**	−0.084**	0.121***	−0.055***	0.130***	−0.052***
	(0.040)	(0.037)	(0.026)	(0.015)	(0.032)	(0.020)
non_operating	−0.014***	−0.025***	−0.014***	−0.025***	−0.015***	−0.026***
	(0.004)	(0.008)	(0.005)	(0.009)	(0.004)	(0.009)
fassets	−0.218***	−0.241***	−0.202***	−0.226***	−0.193***	−0.220***
	(0.040)	(0.040)	(0.019)	(0.014)	(0.018)	(0.014)
inventory	−0.243***	−0.306***	−0.293***	−0.361***	−0.273***	−0.347***
	(0.030)	(0.035)	(0.058)	(0.057)	(0.055)	(0.056)
ass_return	2.165***	1.031***	2.058***	0.938***	2.076***	0.927**
	(0.280)	(0.341)	(0.236)	(0.313)	(0.298)	(0.374)
industry fixed effects	No	No	Yes	Yes	Yes	Yes
time fixed effects	No	No	Yes	Yes	Yes	Yes
R^2	0.141	0.118	0.166	0.146	0.038	0.141
N	6811	6811	6811	6811	6655	6655

The numbers in parentheses are the cluster robust standard error. *, * *, * * * denote significance levels of 10%, 5% and 1% (two-tailed), respectively.

Table 4
The influence of different types of corporate social responsibility on stock returns.

Variables	employee protection		environmental protection		public relations protection	
	(1) raw return	(2) abnormal return	(3) raw return	(4) abnormal return	(5) raw return	(6) abnormal return
post_COVID	−3.795***	−1.003	−3.102***	−0.385	−3.206***	−0.410
	(0.877)	(0.850)	(0.545)	(0.558)	(0.926)	(0.904)
Emp_prot	−1.058*	−1.202**				
	(0.580)	(0.569)				
Emp_prot × post_COVID	1.339*	1.336*				
	(0.746)	(0.745)				
Env_prot			−0.407	−0.578		
			(0.465)	(0.482)		
Env_prot × post_COVID			1.592***	1.581***		
			(0.569)	(0.570)		
Don_prot					−0.371	−0.435
					(0.599)	(0.593)
Don_prot × post_COVID					0.553	0.545
					(0.774)	(0.773)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.285	0.261	0.357	0.269	0.283	0.252
N	1716	1716	793	793	1716	1716

The first and second columns are the regression results of employee protection, the third and fourth columns are the regression results of environmental protection, and the fifth and sixth columns are the regression results of public relations protection. *, * *, * * * denote significance levels of 10%, 5% and 1% (two-tailed), respectively.

Table 5
Mechanism analysis of social trust capital.

Variables	high social trust level		low social trust level	
	(1)	(2)	(3)	(4)
	raw return	abnormal return	raw return	abnormal return
CSR_treatment	−0.364	−0.416	−0.323	−0.322
	(0.313)	(0.302)	(0.446)	(0.451)
post_COVID	−3.831***	−0.806	−3.592***	−0.487
	(0.630)	(0.578)	(0.710)	(0.685)
CSR_treatment × post_COVID	0.848***	0.838***	0.558	0.550
	(0.299)	(0.298)	(0.584)	(0.583)
Control variables	Yes	Yes	Yes	Yes
industry fixed effects	Yes	Yes	Yes	Yes
time fixed effects	Yes	Yes	Yes	Yes
R^2	0.188	0.170	0.164	0.144
N	3613	3613	3042	3042

The first and second columns are the regression results in the high social trust regions, and the third and fourth columns are the regression results in the low social trust regions. In this paper, the average social trust degree is calculated. If a company is located in a province where the so_credit is higher than the average level, it belongs to the high social trust level group; otherwise, it belongs to the low social trust level group. The firms are grouped and regressed by regions. The numbers in parentheses are the cluster robust standard error. *, * *, * * * denote significance levels of 10%, 5% and 1% (two-tailed), respectively.

Table 6
Mechanism analysis of corporate performance.

Variables	(1)	(2)
	ROA	ROA
CSR_treatment	1.960**	2.125**
	(0.801)	(0.878)
curr_liability	−1.501***	−1.376***
	(0.259)	(0.273)
fix_ratio	−0.927**	−0.625*
	(0.449)	(0.363)
in_assets	−13.497**	−6.624
	(6.844)	(7.348)
inv_return	0.583	0.608
	(0.437)	(0.436)
cur_ratio	12.560***	11.555**
	(4.686)	(4.709)
rec_turnover	2.257*	0.993
	(1.163)	(0.640)
Tobin_Q	4.093***	4.003***
	(1.225)	(1.114)
non_operating	0.291	0.156
	(0.284)	(0.314)
fassets	1.042***	0.988***
	(0.307)	(0.320)
inventory	0.013**	0.028***
	(0.006)	(0.008)
ass_return	454.700***	440.594***
	(95.495)	(95.830)
industry fixed effects	No	Yes
time fixed effects	No	Yes
R^2	0.6512	0.6656
N	3148	3148

Robust standard errors clustered at the industry level are in parentheses.*, * *, * * * denote significance levels of 10%, 5% and 1% (two-tailed), respectively.

$$
\begin{aligned}
Stockperformance_{it} = {} & \beta_0 + \beta_1 CSR_i + \beta_2 post\_COVID_t + \beta_3 CSR_i \times post\_COVID_t \\
& + \beta_4\, curr\_liability_i + \beta_5\, fix\_ratio_i + \beta_6\, in\_assets_i + \beta_7\, inv\_return_i \\
& + \beta_8\, cur\_ratio_i + \beta_9\, Tobin\_Q_i + \beta_{10}\, rec\_turnover_i + \beta_{11}\, fassets_i \\
& + \beta_{12}\, non\_operating_i + \beta_{13}\, inventory_i + \beta_{14}\, ass\_return_i + \beta_{15} Industry\,FE_i \\
& + \beta_{16} TimeFE_t + \varepsilon
\end{aligned}
\tag{4}
$$

The explained variable *Stock performance* is the raw return or abnormal return of firm i at time t; *CSR* is a dummy variable, specifically indicating the corporate social responsibility score (*CSR_treatment*), employees protection investment (*Emp_Prot*), environmental protection investment (*Env_Prot*), and public relations investment (*Don_Prot*), they equal zero if their scores are ranked in the

Table 7
Regression results after controlling corporate governance variables.

Variables	(1) raw return	(2) abnormal return
CSR_treatment	−0.360***	−0.397***
	(0.094)	(0.099)
post_COVID	−3.601***	−0.539
	(0.523)	(0.468)
CSR_treatment × post_COVID	0.611***	0.602***
	(0.176)	(0.174)
ove_experience	−0.125**	−0.141**
	(0.062)	(0.057)
mana_shareholder	−0.026	−0.022
	(0.201)	(0.237)
state_owned	−0.218***	−0.232**
	(0.085)	(0.112)
mana_power	0.140**	0.197***
	(0.070)	(0.066)
Shareholder_num	−0.117	0.021
	(0.226)	(0.216)
curr_liability	0.031	0.044**
	(0.027)	(0.021)
fix_ratio	0.745*	0.812*
	(0.451)	(0.492)
in_assets	−0.288	−0.136
	(0.391)	(0.412)
inv_return	0.213***	0.153***
	(0.036)	(0.039)
cur_ratio	−0.495*	−0.285
	(0.297)	(0.285)
rec_ turnover	−0.096*	−0.070
	(0.058)	(0.060)
Tobin_Q	0.125***	−0.053*
	(0.035)	(0.027)
non_operating	−0.016***	−0.026***
	(0.003)	(0.007)
fassets	−0.238***	−0.274***
	(0.021)	(0.030)
inventory	−0.303***	−0.374***
	(0.063)	(0.066)
ass_return	2.302***	1.266***
	(0.281)	(0.336)
industry fixed effects	Yes	Yes
time fixed effects	Yes	Yes
R^2	0.174	0.158
N	6811	6811

Robust standard errors clustered at the industry level are in parentheses.*, * *, * * * denote significance levels of 10%, 5% and 1% (two-tailed), respectively.

bottom quartile, and one otherwise; *post_COVID* equals one for the time after the event week, and zero otherwise. *Industry FE* is industry fixed effect of firm *i; Time FE* is the virtual variable of the time; ε is the random error term.

Finally, we use the propensity score matching difference in differences (PSM-DID) model to accurately explore the impact of corporate social responsibility on the stock returns during the COVID-19. After 1:1 neighbor matching in 0.05 caliper, we regress Eq. (4) again.

2.2. Descriptive statistics

The descriptive statistics on the main variables are shown in Table 2. It is indicated that there are differences in the level of stock returns of different firms. The control variables are consistent with the result of the existing research.

3. Result analysis

3.1. Preliminary regression results

Table 3 reports the regression results of corporate social responsibility on the raw return and abnormal return. In columns (1) and (2), we run the cross-sectional regressions, and the coefficients on *CSR_treatment* are significant and positive, which confirm that companies with high levels of social responsibility have higher stock returns. Based on the effects, we further use the DID model to test
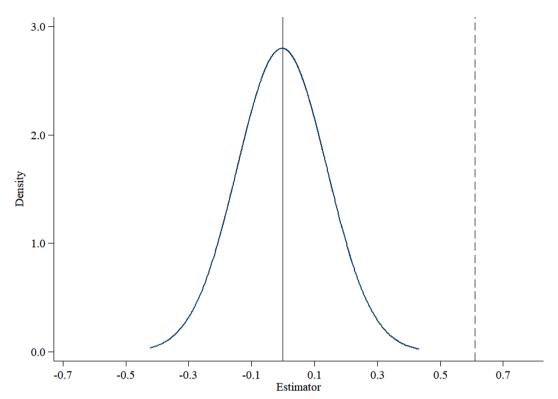
Fig. 1. Placebo tests of raw return.

our hypothesis more precisely. In columns (3) and (4), we run the DID regressions for our main test. The results show that the regression coefficients on *CSR_treatment* × *post_COVID* are significantly positive ($\beta = 0.611$, $p < 1\%$; $\beta = 0.602$, $p < 1\%$), which indicate that to a certain extent, social responsibility can play the role of "shield" to reduce the degree of reduction in stock returns during the COVID-19 pandemic. Columns (5) and (6) report the regression results of corporate social responsibility on stock returns using PSM-DID model. After balanced tests, we find that most of the variables have not significantly difference after matching. We can see that the coefficients of *CSR_treatment* × *post_COVID* are still significantly positive, which indicate the robustness of the positive effect of corporate social responsibility on stock returns during the epidemic.

3.2. Analysis of different types of corporate social responsibility

Moreover, we explored the correlation between different types of social responsibilities and the capability of firms to cope with the pandemic. In the regression analysis of environmental protection investment, we only select the samples of heavily polluting firms, because these firms need to assume responsibility for environmental protection. We find that there is no correlation between different types of corporate social responsibilities. As indicated in Table 4, the coefficients on *Emp_prot* × *post_COVID* and *Env_prot* × *post_COVID* are significantly positive, which indicate that the responsibility of employee protection and environmental protection can help firms to reduce the reduction in stock returns. However, the regression coefficient on *Don_prot* × *post_COVID* is not significant, which indicates that corporate philanthropy and other public relations expenditures are not preferred by shareholders.

3.3. Exploration of the mechanism

We use the indirect test method to explore the mechanism of social trust capital (Lins et al., 2017). If corporate social responsibility is performed through social capital such as trust, it is easier for firms to obtain social capital in regions with high social trust, and the impact of corporate social responsibility should be greater in these regions. Because in those regions with a low level of trust, it is possible for corporate social responsibility activities to be regarded as cosmetic activities, as a result of which they are unlikely to gain returns. Besides, customers, employees, and other stakeholders are more likely to reward trustworthy firms in regions with high levels of trust, and the stock prices are heavily influenced by local investors. Social trust (so_credit) is obtained from the Chinese General Social Survey (CGSS) conducted in 2015, and the higher the value, the higher the social trust. The results are presented in Table 5.

Columns (1) and (2) show that in regions with high social trust, corporate social responsibility has a positive impact on stock returns. While the regression results of firms in regions with low social trust levels are not significant. It means that social trust capital is one of the mechanisms.

Second, corporate social responsibility can improve the performance of the enterprise during the epidemic, and then affect stock
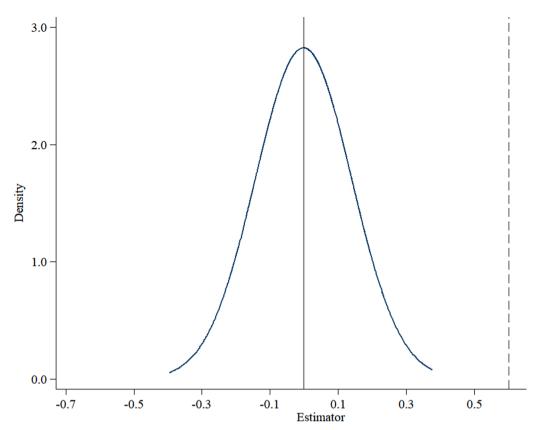
Fig. 2. Placebo tests of abnormal return.

returns. We collected quarterly data from March 2020 to March 2021 after the outbreak, and performed a regression analysis on ROA (net profit/ total assets) of enterprise with different levels of social responsibility after the COVID-19 outbreak. Formula (5) is used as the model and the results are shown in Table 6.

$$ROA_{it} = \varphi_0 + \varphi_1 CSR\_treatment_i + \varphi_2\, curr\_liability_{it} + \varphi_3 fix\_ratio_{it} + \varphi_4\, in\_assets_{it} + \varphi_5\, inv\_return_{it}$$
$$+\varphi_6\, cur\_ratio_{it} + \varphi_7\, Tobin\_Q_{it} + \varphi_8\, rec\_turnover_{it} + \varphi_9 fassets_{it} + \varphi_{10}\, non\_operating_{it} \tag{5}$$
$$+\varphi_{11}\, inventory_{it} + \varphi_{12}\, ass\_return_{it} + \varphi_{13} IndustryFE_i + \varphi_{14} TimeFE_t + \varepsilon_{it}$$

The results show that the regression coefficients on *CSR_treatment* are significantly positive, which indicate that enterprises with high-CSR have a higher ROA. That is, assuming corporate social responsibility can reveal the corporate performance. Thus, firms with a higher level of CSR get higher stock returns during the pandemic.

3.4. Robustness test

To enhance the robustness of our results, we conducted some robustness test.

First, we ensure that our findings will persist after controlling the corporate governance measures. Recent studies find that better governed firms performed better during the crisis. If governance is relevant to the corporate social responsibility, then it is possible that corporate social responsibility is just proxying for governance, resulting in omitted variable bias. Therefore, we control some variables that related to corporate governance, specifically the manager's management experience (*ove_experience*), number of shares held by managers (*mana_shareholder*), enterprise ownership type (*state_owned*), manager power (*mana_power*) and the number of shareholders (*shareholder_num*). The regression results are shown in Table 7. We can find that our results are not due to differences in corporate governance.

Second, we control the main factors that may affect the stock returns. However, it is still impossible to completely eliminate the problem of omitted variable bias. Therefore, we conduct the placebo tests of randomly assigned samples. We randomly distribute the corresponding proportion of *CSR_treatment* among the sample 200 times, and record the coefficient of *CSR_treatment* × *post_COVID* each time. Kernel density curves of the 200 coefficients are shown in Figs. 1 and 2. We can find that both curves are consistent with the normal density and away from the original coefficients. Therefore, placebo tests support the findings in this paper.

4. Conclusions

Using data from listed companies in China, we show that corporate social responsibility is conducive to improving stock returns during the COVID-19 pandemic. The impact of employee protection and environmental protection responsibilities on stock returns are significant, while the responsibility of public relations such as charitable donation makes no significant impact on stock returns. It means that environmental protection responsibility and employee protection responsibility are approved by investors and can play an important role in maintaining the stability of stock prices during the epidemic. According to the mechanism analysis, the higher the level of corporate social responsibility, the more social trust capital the firm obtains. In addition, firms with high social responsibility have better corporate performance after the epidemic, so they can get higher stock returns. Our conclusions provide a reference for government and firms to make decisions.

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