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Performance of socially responsible firms during the COVID-19 crisis and trading behavior by investor type: Evidence from the Korean stock market

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ABSTRACT

The COVID-19 pandemic in Korea provides grounds for understanding the effect of corporate social responsibility (CSR) on the stock returns and trading behavior of investors, particularly when most businesses have fallen on hard times. This study empirically finds that CSR reputations are associated with higher returns and lower volatilities by comparing the two portfolios which are composed of CSR and non-CSR firms, respectively. We also discover that public pension funds and other institutional investors have liquidated non-CSR stocks more aggressively than CSR stocks. This indicates that institutional investors consider CSR to transform their stock portfolios into less risky ones.

1. Introduction

Although numerous academic studies have attempted to illuminate the link between corporate social responsibility (CSR) and the financial performance of firms, their findings are inconsistent, showing positive (Lins et al., 2017; Edmans, 2011), negative (Brammer et al., 2006; Di Giuli and Kostovetsky, 2014), and irrelevant (Bae et al., 2021) relationships. The economic turmoil caused by the COVID-19 pandemic provides an appropriate circumstance for determining whether socially responsible corporations perform better, particularly when most businesses have fallen on hard times. In this context, our study investigates whether CSR affected the performance and investors’ trading behavior in the Korean stock market during the coronavirus outbreak.

The Korean financial market during the coronavirus outbreak is the right place at the right time to examine such effects for several reasons. After its first confirmed COVID-19 case on January 20, 2020, South Korea became the second most infected country after China by early March and was the first among the developed countries to suffer from the new virus. Therefore, we can expect to observe early investor responses to the COVID-19 outbreak in the country. Furthermore, we can directly analyze the concerns of investor groups on CSR achievement by using a detailed dataset which is not available in most countries.

We examine the effect of CSR reputations by comparing the abnormal returns of the two groups, CSR and non-CSR firms. When almost all the stock values dropped right after COVID-19 started to spread, CSR firms went down a little less than non-CSR firms. Similarly, CSR firms earned significantly higher returns than non-CSR firms, while the stock market recovered and surged. CSR firms

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also had smaller volatilities during both intervals. These results suggest that CSR reputations are associated with higher returns and lower volatilities during the crisis.

Using a unique dataset on investor types offered by the Korean Exchange, we also discuss each type of investor’s concerns about CSR by analyzing their trading behavior. Individual investors had consistently bought shares, although the others had sold. However, public pension funds and other institutional investors liquidated non-CSR firms’ holdings more aggressively than CSR firms’ holdings when they must reduce risk in a portfolio, and thus resort to selling stocks.

Some recent studies have analyzed the transmission of CSR information embedded within a firm to the equity market; they focused on the connection between CSR ratings and stock returns during the pandemic, but the findings remained inconclusive. Ding et al. (2021) document that companies with high CSR ratings are associated with higher returns in 61 economies. Albuquerque et al. (2020) and Broadstock et al. (2021) report similar findings in the United States and China, respectively. In contrast, Bae et al. (2021) find no evidence that CSR characteristics have led to financially significant effects in the United States. This article contributes to the literature on CSR by inspecting both the short- and long-term performance and scrutinizing the response of each investor group to the environmental crisis in Korea.

The remainder of this paper is organized as follows. Section 2 describes the data, and Section 3 presents the empirical results. Section 4 concludes.

2. Data and methods

We focus on the financial performance of Korean companies listed on the Dow Jones Sustainability Indices (DJSI). As of September 2019, the DJSI covered 43 Korean companies, all of which are components of the KOSPI 200 index, accounting for 93% of the total market value of the Korean Stock Exchange. We assume that these companies listed in the DJSI have robust CSR programs and compare their performance with others in the KOSPI 200 index. We exclude 17 financial firms because they usually have high leverage, which is more likely to demonstrate distress. We also exclude 16 biotechnology companies because their stock returns are expected to be high due to the mortality risk from coronavirus, regardless of their social responsibility actions. Consequently, we construct samples with 34 firms in the DJSI and 133 firms that are not in the DJSI. The financial and accounting information on the sample firms is collected from Dataguide.

To address the impact of CSR activities during the crisis, we cover the post-COVID-19 era, a period from January 20, 2020 to February 28, 2021. Two equally weighted portfolios are constructed: (1) Portfolio of DJSI stocks, (2) Portfolio of non-DJSI stocks. Fig. 1 displays the cumulative returns of both portfolios on a daily basis. Since the beginning, the coronavirus outbreak caused a significant decline in the returns of both portfolios, and the spike in the number of cases in late February made both portfolios slide even further. As the global coronavirus spread continued in March, the Korean stock market plunged further with several circuit-breaker halts, and the Korean government unveiled financial market stabilization measures, including a temporary short-selling ban that ended in May 2021. On March 23, 2020, the DJSI and the non-DJSI portfolios recorded the lowest returns, 53.34% and 50.29%, respectively. Since then, the stock market bounced back and continued to surge till the end of the year; the main KOSPI index broke above 3000 for the

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1 One study performed by SustainAbility (2019) reports that global companies value the SAM Corporate Sustainability Assessment (the underlying assessment for the DJSI) as the most useful rating tool.
first time on January 6, 2021. By the last date of our sample period, the DJSI portfolio produced a cumulative return of 37.31%, and the non-DJSI portfolio earned 30.41%.

3. Empirical results

3.1. Risk-adjusted abnormal returns

We examine how CSR activities are tied to the enhancement of firm value by comparing the risk-adjusted abnormal returns of the two groups using a model by Fama and French (1993). When computing abnormal returns adjusted to three factors, we use the daily returns of the KOSPI 200 index for market returns and the Certificate of Deposit (91 days) interest rate for the risk-free rate. After running ordinary least squares regressions for the previous year of data, we obtain risk-adjusted abnormal returns by subtracting the expected returns from daily returns.

Table 1 presents the descriptive statistics of the risk-adjusted returns of the KOSPI 200, the DJSI, and the non-DJSI stock portfolios from January 20, 2020 to February 28, 2021. We find that the DJSI portfolio outperformed the non-DJSI portfolio; the former gained 0.0215%, whereas the latter lost 0.0054% on a daily basis. For both subsequent periods, the DJSI portfolio dominates as well; the DJSI portfolio decreased 0.0353% less in the first sub-period and increased 0.0253% more in the second sub-period than in the non-DJSI portfolio. It also shows that volatility is lower for the DJSI firms in the entire sample period and the two subsequent periods.

3.2. Cumulative abnormal returns

Next, we quantify cumulative abnormal returns (CARs) by adding up risk-adjusted abnormal returns and compare the CARs of the two groups. Fig. 2 illustrates the time-series of the cumulative abnormal returns of the DJSI and the non-DJSI portfolios for the entire sample period. CARs took a significant dive until March 23, 2020, and rebounded quickly thereafter. Surprisingly, unlike raw returns, the DJSI portfolio fell less when the market declined and rose more in the recovery period than the non-DJSI portfolio. In the second period, the difference between the CARs of the DJSI and the non-DJSI portfolios is statistically significant, although not in the first period.

Table 1. Risk-adjusted abnormal returns.

| Sample     | Period       | 2020.1.20–2021.2.28 |          | 2020.1.20–2020.3.23 |          | 2020.3.23–2021.2.28 |          |
|------------|--------------|---------------------|----------|---------------------|----------|---------------------|----------|
|            | N            | Mean                | S.D.     | Mean                | S.D.     | Mean                | S.D.     |
| KOSPI 200  | 167          | 0.0001              | 0.8293   | −0.3975             | 1.1457   | 0.0762              | 0.7330   |
| DJSI       | 34           | 0.0215              | 0.7880   | −0.3694             | 0.9332   | 0.0963              | 0.7360   |
| Non-DJSI   | 133          | −0.0054             | 0.8719   | −0.4047             | 1.2214   | 0.0710              | 0.7680   |

Note: The numbers are computed over the entire sample period and two subsequent periods, showing both fall (2020.1.20–2020.3.23) and rise (2020.3.24–2021.2.28).

Fig. 2. Cumulative abnormal returns of the DJSI and the non-DJSI stock portfolios.
period. This means that almost all the stocks went down during the market crash, but CSR stocks earned higher returns when the market recovered from the lows.\(^2\)

To explore further how CSR companies responded to the COVID-19 outbreak in the early stage, we perform event studies around three major events: the first confirmed case of COVID-19 on January 20, 2020; a sudden jump of confirmed cases in Daegu, South Korea on February 18, 2020; and the World Health Organization’s (WHO) pandemic declaration on March 11, 2020. The South Korean city of Daegu was struck by the first large coronavirus outbreak outside of China on February 18, 2020, which was triggered by the spread of infection from a local church gathering. There were only 30 confirmed cases before this date, which suddenly increased to more than 2000 in a week.

Table 2 displays the short-term CARs of the DJSI and the non-DJSI portfolios. We take windows of 3 (\(-1, 1\)), 5 (\(-2, 2\)), 11 (\(-5, 5\)), and 21 (\(-10, 10\)) days. Around the first case of infection, CARs are higher for the DJSI companies, except for CAR\([-5, 5]\]. When infection numbers soared in Daegu, the DJSI portfolio performed better for all intervals but the 21-day window. When the WHO described COVID as a pandemic, only CAR\([-10, 10]\) is greater for the DJSI portfolio and the other CARs are higher for the non-DJSI portfolio. As COVID-19 spread quite early in Korea as compared with other countries, the WHO’s official declaration of the pandemic was not so surprising that CSR companies could not outperform around the event.

We take windows of 41 (\(-20, 20\)), 251 (\(-125, 125\)), and 501 (\(-250, 250\)) days around the first case of infection and compare the performance of the two groups in the long run. Table 3 shows the CARs for long-term periods and two subsequent periods for each analysis, before and after the event. For all event windows, the DJSI portfolio has higher long-term CARs than the non-DJSI portfolio. In particular, the differences in CAR are all greater after each event, which implies that firms with active social responsibilities performed relatively better in the post-event period than in the pre-event period.

3.3. Trading behavior by investor type

In this section, we explore the differences in the behavior and performance of various investor groups regarding CSR firms. Investors are categorized into four groups: individual, foreign, public pension funds, and other institutional investors. We compute the net buying ratio (NBR) for each investor group, as follows:

\[
NBR_{\text{INVESTOR}} = \frac{B_i - S_i}{B_i + S_i} \tag{1}
\]

where \(B_i\) and \(S_i\) are the amounts of stock i that each investor group bought and sold, respectively. We obtain the average NBRs of the firms in the DJSI and the non-DJSI portfolios for each investor type, which are presented in Table 4. Since the first confirmed case, individual investors had bought shares of both portfolios, while the other investors had sold persistently. Interestingly, pension funds and other institutional investors reduced shareholding of CSR firms relatively slowly, though they sold shares of non-CSR firms more quickly. When pension funds and other institutional investors were trying to reduce the risk of their portfolios by selling stocks, they were also transforming their stock portfolios into less risky portfolios by liquidating more non-CSR stocks. This corresponds with

\(^2\) Although we do not report here, additional regression analysis for robustness confirms that CSR plays a positive role in stock returns.
Table 4. Average net buying ratio by investor type.

| Investor Group | 2020.1.20–2021.2.28 | 2020.1.20–2020.3.23 | 2020.3.24–2021.2.28 |
|----------------|---------------------|---------------------|---------------------|
|                | DJSI                | Non-DJSI             | Difference          | DJSI | Non-DJSI | Difference | DJSI | Non-DJSI | Difference |
| NBR\text{Indi} | 0.022               | 0.025                | −0.003              | 0.091 | 0.074    | 0.018      | 0.016 | 0.022    | −0.007     |
| NBR\text{Fore} | −0.032              | −0.029               | −0.003              | −0.066 | −0.041  | −0.025     | −0.023 | −0.026   | 0.003      |
| NBR\text{Pens} | −0.024              | −0.088               | 0.064               | −0.013 | −0.037  | 0.025      | −0.022 | −0.099   | 0.077      |
| NBR\text{Other} | −0.039              | −0.080               | 0.041               | −0.099 | −0.102  | 0.003      | −0.027 | −0.078   | 0.052      |

Note: $NBR\text{Indi}$, $NBR\text{Fore}$, $NBR\text{Pens}$, and $NBR\text{Other}$ are the average net buying ratios for individual, foreign, public pension funds, and other institutional investors, respectively.
Table 5. Stock returns and trading behavior of investor groups.

| variables | CAR[0,5] | CAR[0,10] | CAR[0,125] | CAR[0,250] |
|-----------|----------|-----------|------------|------------|
| NBR\textsubscript{Indi} | $-0.112^{***}$ | $-0.177^{***}$ | $-1.466^{**}$ | $-1.31$ |
| (−3.902)  | (−3.978) | (−3.421)  | (−1.295)  |
| NBR\textsubscript{Fore} | $-0.004$ | $0.036$ | $0.425$ | $1.537^{***}$ |
| (−0.230)  | (1.185) | (1.451)  | (2.860)  |
| NBR\textsubscript{Pens} | $0.012$ | $0.034^{*}$ | $-0.063$ | $0.422^{**}$ |
| (0.949)   | (1.809) | (−0.456) | (1.990)  |
| NBR\textsubscript{Other} | $0.081^{***}$ | $0.085^{**}$ | $0.956^{***}$ | $1.046^{***}$ |
| (4.452)   | (3.055) | (3.815)  | (2.634)  |
| Constant   | $0.006$ | $0.008$ | $0.104^{***}$ | $0.173^{***}$ |
| (1.466)   | (1.209) | (3.551)  | (4.383)  |
| N          | 167      | 167       | 167        | 167        |
| Adj $R^2$  | 0.366    | 0.324     | 0.239      | 0.196      |

Note: NBR\textsubscript{Indi}, NBR\textsubscript{Fore}, NBR\textsubscript{Pens} and NBR\textsubscript{Other} are the average net buying ratios for individual, foreign, public pension funds, and other institutional investors, respectively. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Pedersen et al. (2021), where ESG scores and shareholdings of institutions are positively correlated.

We take a closer look at the relationship between the trading behavior of each investor type and stock performance by running the following regression:

$$\text{CAR}_{(t_1,t_2)} = \beta_0 + \beta_1 \text{NBR}_{\text{Indi}} + \beta_2 \text{NBR}_{\text{Fore}} + \beta_3 \text{NBR}_{\text{Pens}} + \beta_4 \text{NBR}_{\text{Other}} + \epsilon_i$$

where \text{CAR}_{(t_1,t_2)} is a cumulative abnormal return and \text{NBR}_{\text{Indi}} is a cumulative NBR of individual investors from \(t_1\) to \(t_2\). \text{NBR}_{\text{Fore}}, \text{NBR}_{\text{Pens}} and \text{NBR}_{\text{Other}} represent the cumulative NBRS of foreign, public pension funds, and other institutional investors, respectively. Table 5 shows the results. First, the coefficients of the NBRS of individual investors are significantly negative at the 1% level for \text{CAR}[0,5], \text{CAR}[0,10], and \text{CAR}[0,125]. This implies that individuals in Korean stock markets actively purchased shares when prices fell after the first confirmed case of COVID-19. Meanwhile, all \(\beta\) estimates for other institutional investors are significantly positive at the 1% level for all periods. It seems that they intensively decreased shares when prices fell and passively lowered stock holdings during recovery.

4. Conclusion

This study examines whether CSR reputations are associated with financial performance and investors’ trading behavior in the Korean stock market. The results are twofold. First, companies with CSR reputations earn higher returns and carry a lower risk. The difference in abnormal returns between CSR and non-CSR firms is observed in both short- and long-term periods. Second, different types of investors distinctly traded the shares of CSR firms. During the pandemic, individual investors continued to buy stocks while pension funds, foreign investors, and other institutional investors continued to sell. Meanwhile, pension funds and other institutional investors liquidated non-CSR stocks more actively. This implies that institutional investors take CSR into consideration when managing stock portfolios during the COVID-19 outbreak. This article contributes to the literature on the effect of CSR on the stock returns and trading behavior by investor type, especially during the coronavirus crisis.

Institutional investors are now recognizing climate change as an important risk factor for investments (Bansal et al., 2016; Krueger et al., 2020). Our evidence suggests that companies would be willing to pay extra for social responsibility to attract more institutional investors. Therefore, the results presented in this paper may infer that companies would not respond negatively if governments implement a mix of policies and regulations stringent enough to ensure compliance with global climate agreements such as the COP26 COVID-19 Code of Conduct.

CRediT authorship contribution statement

Sangki Lee: Conceptualization, Data curation, Software. Dongyup Lee: Methodology, Writing – original draft. Chunhun Hong: Supervision, Project administration. Myung-Ho Park: Investigation, Writing – review & editing.

Declaration of Competing Interest

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