

# Corporate social responsibility's effect on stock returns during the Covid-19 crisis: Evidence from U.S. markets

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**Abstract**

I found that social capital measured by Corporate Social Responsibility (CSR) activities had a negative effect on stock returns during the Covid-19 from February 2020 to August 2020. High-CSR firms had two to four percentage points lower returns. Financial characteristics like profitability and cash holdings tended to have a bigger impact on returns during this period. I performed multiple regressions to analyse the effect of CSR on raw buy-and-hold returns and abnormal returns, while controlling for multiple financial characteristics and other control variables. I used data from the United States and my sample covered 1023 firms.

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**Keywords** CSR, Corporate social responsibility, Social Capital, Trust, Covid-19, United States

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# Contents

1. Introduction.....	4
1.1 <i>Social capital, trust and corporate social responsibility</i> .....	5
2. Data and descriptive statistic.....	5
2.1 <i>Data collection</i> .....	5
2.2 <i>Descriptive statistic</i> .....	8
2.3 <i>Correlation between variables</i> .....	9
3. Analysis and results .....	10
3.1 <i>Main results</i> .....	11
3.2 <i>Different elements of CSR during the crisis</i> .....	14
3.3 <i>Market crash in February 2020 – March 2020</i> .....	16
3.2 <i>Robustness tests</i> .....	17
4 Discussion.....	18
5 Conclusion .....	20
References.....	22
Appendix .....	23

# 1. Introduction

In this paper, I study how social capital measured by Corporate Social Responsibility (CSR) has affected returns during the Covid-19 crisis from February 2020 to August 2020. I find that CSR has slightly negative effects on returns during the crisis. Regressing raw returns on the CSR and control variable I find that CSR has a statistically significant coefficient of -0.069. High-CSR firms tend to have two to four percentage points lower returns compared to firms with lower CSR scores. Firms with higher profitability and cash holdings tend to perform better during the crisis. I examine how different elements of CSR affect investors' views. Investors seem to appreciate the environmental and external aspects more during the Covid-19. I also found that during the worst market collapse between 20.02.2020 – 23.03.2020, CSR activities seem to have a small positive effect on the stock returns.

This study is relying on the previous study made by Karl V. Lins, Henri Servaes, and Ane Tamayo in 2017 (*Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis*, published in *The Journal of Finance*, Vol: 72, No. 4, pp. 1785-1823). They found that high-CSR firms had four to seven percentage points higher stock return than low-CSR firms during the financial crisis. They also showed that the investments in social capital paid off during a period when trust in the financial market was low. Inspired by this, I study whether the same effect exists during the Covid-19 crisis.

Therefore, my main hypothesis is that corporate social responsibility does not have a positive effect on returns during the Covid-19 crisis. To test this hypothesis, I perform multiple cross-sectional regression models to measure effect of CSR on these returns. Overall, my sample covers 1023 U.S. firms, which performance I measure by using raw buy-and-hold returns and abnormal returns over the crisis period.

*H0: Corporate Social Responsibility does not have a positive effect returns during the Covid-19 crisis.*

The rest of the paper proceeds as follows. In section 2, I present the used data and define the main variables. In section 3, I present the analysis and main findings. In section 4, I discuss the findings and the main reasons behind them. In the last section, I conclude the study.

## *1.1 Social capital, trust and corporate social responsibility*

Social capital means the social networks and cooperation in a company which might have a positive impact on the community. Social capital enables collective action and therefore can have positive outcomes when individuals or actors act inline with the same norms and have trust in each other. Putnam (1993, 2000)

Trust can be seen as the belief that others, individuals or institutions, will take actions that are beneficial or at least not harmful to us and it will make us more willing to cooperate with them. Social capital and trust are very interconnected and can help each other. (Sapienza and Zingales (2012,) Gambetta (1988)).

World Business Council for Sustainable Development has defined CSR as “--the commitment of a business to contribute to sustainable economic development, working with employees, their families, the local community and society at large to improve the quality of life.” (WBCSD, 2000, p.229). It is often seen as something that starts when the laws end and as actions that benefit the society and environment.

CSR activities and investments in CSR can be seen as a firm’s possibility to build their social capital and trust. Therefore CSR could be used to measure social capital at the firm level, even though it is not a perfect measure. Because social capital can help build stakeholder trust and engagement, being a high-CSR firm could be beneficial in periods when the trust level is low, such as a crisis. (Lins, Servaes, and Tamayo, 2017) This is what was seen during the financial crisis and therefore, I want to study if the same has occurred during the Covid-19 crisis as well.

## **2. Data and descriptive statistic**

### *2.1 Data collection*

In this study, for my main data, I used publicly traded US companies. I gathered my sample from Thomson Reuters Eikon. I chose to use this platform because they offer a comprehensive ESG database that covers more than 80% of the global market cap (Refinitiv, 2020).

First, I defined the CSR score for each firm. To estimate CSR, I used the Refinitiv’s environment, social, and governance (ESG) rating. They divide the ESG score into three pillars: Environmental, Social, and Governance. I focus on two of these pillars, environmental and social pillars, because the governance category is usually not considered a part of corporate social responsibility (Lins, Servaes, and Tamayo 2017). However, I include the governance category in robustness checks. The environmental category includes resource use, emission

reduction, and innovation. The social pillar includes workforce, human rights, community, and product responsibility. As in Servaes and Tamayo (2013), I excluded innovation and product responsibility because they are heavily industry-weighted and considered as out of the CSR scope. Finally, the governance pillar includes management, shareholders, and CSR strategy.

After that, I determined the weight for each category by using the number of indicators that Refinitiv uses to estimate each category. Measurability is an important part of determining a proper CSR rating, which is why I chose to emphasize more mature and transparent metrics. To avoid survivorship bias, I include also inactive companies, I handled cases so that if a company's stock prices had dropped by more than 90% and Eikon did not find available price data I added raw return – 99,99%. . However, I made a robustness check to these adjustments,

**Table 1- Definitions to each category**

This table is partly adopted from Refinitiv (2020) ESG report. Definitions are direct quotes from this report Appendix F p.22.

<b>Category</b>	<b>Definition</b>	<b>Indicators</b>	<b>Weight</b>
<b>Environment</b>			
Resource Use	The resource use score reflects a company's performance and capacity to reduce the use of materials, energy, or water, and to find more eco-efficient solutions by improving supply chain management.	20	20%
Emission	The emission reduction score measures a company's commitment and effectiveness towards reducing environmental emissions in its production and operational processes	28	28%
<b>Social</b>			
Workforce	The workforce score measures a company's effectiveness in terms of providing job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities and development opportunities for its workforce.	30	30%
Human rights	The human rights score measures a company's effectiveness in terms of respecting fundamental human rights conventions.	8	8%
Community	The community score measures the company's commitment to being a good citizen, protecting public health and respecting business ethics	14	14%
<b>Total</b>		<b>100</b>	

to avoid selection biasedness.

In table 1, can be seen that the weights are very different for each category. The workforce, emissions and resource use receive the largest weights, and together they cover 78% of the total CSR score. That is why I also examined the categorical test to see which section might drive CSR performance.

Finally, I calculated the CSR score for each firm by using a weighted average. The final CSR score is between 0 and 100. I converted the CSR score to percentages for later regressions to make it easier to compare it to other variables.

Before I gathered the final accounting and markets data from Eikon, I excluded small firms with under \$250M market capitalization to ensure enough liquidity. After that, I excluded banks and insurance companies due to the differences in accounting data and relief packages rolled out by the FED. (Wade, 2020) I also chose to exclude the Medical and Pharmaceutical industry because the industry benefited a lot from this particular crisis and it also received economical support from the state. To avoid survivorship bias, I include also inactive companies, I handled cases so that if a company's stock prices had dropped by more than 90% and Eikon did not found available price data I added raw return – 99,99%. . However, I made a robustness check to these adjustments, to avoid selection biasedness.

The reference paper defined the financial crisis as the period from August 2008 to March 2009. In August 2008 Lehman Brothers went into bankruptcy and markets began to decline, while March 2009 was the month when many large US indexes hit their lowest points.

In defining the crisis period, I took a different approach. I focused on the whole crisis instead of the market collapse from February 2020 to March 2020. This is mainly because I made this research while the Covid-19 crisis was still on, but also because it would have been too big of an assumption to assume that trust would be recovered in March. Cerqueti and Ficcadenti (2020) showed that trust in financial markets measured by Google searches did not recover immediately after the market collapse. I defined the crisis period from February 2020 to August 2020. August 2020 was the latest month where data were available when I started the research. February 2020 was the turning point in financial markets when at the end of the month, the S&P 500 started to decline (Ozili & Arun, 2020). However, I also examined the market crash period individually in addition to my main results.

I measure performance over the crisis period in two ways, which are raw returns and abnormal returns. Raw returns are buy-and-hold returns over February 2020 to the end of August 2020, including possible dividend payments. I calculated abnormal returns by subtracting expected

returns from raw returns. Expected returns are calculated by using McKinley's (1997) market model. I calculated the expected returns from 60 months before the crisis, the last month being January 2020.

## 2.2 Descriptive statistic

I obtained a descriptive statistic for the main variables. Table 2 summarizes my main explanatory variables and their main characteristics. First, the raw returns' mean is 10,9 % which is expected due to the fast recovery of the markets. Abnormal returns tended to be slightly negative, which is expected due to the exclusion of the Medical and Pharmaceutical sector which performed better during the crisis. Average Market capitalization is high (presented: \$M) because I exclude all the small firms (under \$250M market Capitalization).

**Table 2 – Descriptive statistics**

The data contain 1023 US companies, excluding the financial, medical, and pharmaceutical sectors. Returns are measured during the Covid-19 crisis, from February 2020 to August 2020. *CSR rating* is calculated using five different ESG categories (environment, workforce, emissions, human rights, and community) from Eikon Refinitiv. *Crisis period Raw Return* is the buy-and-hold return over the crisis period. *Crisis period abnormal return* is raw return minus expected return, which is calculated by using a market model over the 60 months before the crisis. *Market Cap* is market capitalization presented in millions \$. *Long-term Debt* is long-term liabilities divided by total assets. *Short term debt* is current liabilities divided by total assets. *Cash holdings* is computed as cash and marketable securities divided by total assets. *Profitability* is computed as operating income divided by total assets. *Book-to-Market* is book value divided by market cap. *Negative Book-to-Market* is a dummy variable so that if a firm has a negative book-to-market ratio they get 1 and 0 if it is positive. *Momentum* is calculated over the year before the crisis from January 2019 to January 2020. All the financial data is taken from the last day of the year 2019.

	Mean	Std Dev	25 %	Median	75 %
<i>CSR rating</i>	40.8	25.4	18.9	35.8	59.0
<i>Crisis period Raw return</i>	0.109	0.545	-0.128	0.045	0.244
<i>Crisis period Abnormal return</i>	-0.011	0.542	-0.246	-0.071	0.124
<i>Market Cap</i>	17200	55838	1465	3902	12669
<i>Long term debt</i>	0.292	0.244	0.141	0.278	0.402
<i>Short term debt</i>	0.213	0.141	0.113	0.180	0.280
<i>Cash holdings</i>	0.120	0.147	0.020	0.061	0.159
<i>Profitability</i>	0.062	0.112	0.025	0.061	0.105
<i>Book to Market</i>	0.427	0.558	0.169	0.340	0.537
<i>Negative B/M</i>	0.056	0.229	0.000	0.000	0.000
<i>Momentum</i>	0.157	0.443	-0.089	0.139	0.355
<i>Idiosyncratic risk</i>	0.009	0.015	0.003	0.006	0.010



### 2.3 Correlation between variables

I computed a correlation matrix to see how each variable correlates with each other. Table 3 shows that there is a high correlation (0.63) between Ln(Market Cap) and CSR rating, this makes sense since large companies are prone to invest more in sustainability (Norton, 2020). Also, raw return and abnormal return have a high correlation of 0.9 but that does not affect regression results when returns are regressed separately. Also, Raw returns and Abnormal returns have a slightly negative correlation, which indicates that CSR does have a negative effect on returns. I also computed the variance inflation factor (Appendix 1) to prevent multicollinearity in my further regression models. In Appendix 1, variance inflation factor shows that all variables are under five and therefore acceptable and should not cause any multicollinearity in my regressions.

**Table 3 – Correlation Matrix**

	CSR	Raw return	Abnormal return	Ln(Market Cap)	Long term debt	Short term debt	Cash holdings	Profitability	Book to Market	Neg. B/M	Momentum
Raw return	-0.08										
Abnormal return	-0.05	0.90									
Ln(Market Cap)	0.63	-0.07	-0.08								
Long-term debt	0.10	-0.07	-0.06	0.13							
Short-term debt	0.03	0.15	0.13	-0.04	-0.11						
Cash holdings	-0.19	0.16	0.11	-0.09	-0.28	0.17					
Profitability	0.12	-0.09	-0.12	0.29	-0.01	-0.13	-0.05				
Book to Market	-0.05	0.03	0.09	-0.27	-0.15	-0.18	-0.17	-0.15			
Negative B/M	0.03	0.03	0.03	0.02	0.50	0.26	0.02	-0.02	-0.29		
Momentum	0.01	0.06	-0.02	0.19	0.02	0.05	0.07	0.01	-0.36	0.05	
Idiosyncratic risk	-0.22	0.13	0.10	-0.35	-0.02	0.10	0.14	-0.30	0.12	0.07	-0.05

### 3. Analysis and results

To analyze the CSR effect during the Covid-19 crisis I produced several cross-sectional ordinary least squares (OLS) regression models with different control variables. The objective was to answer the main hypothesis which is that CSR does not have a positive effect on returns during the Covid-19 crisis. In addition to the CSR and financial variables, I include regional and industry dummies, because different regions and industries have taken different impact during the Covid-19.

Like Lins, Servaes, and Tamayo (2017), I also study the firms' financial characteristics as control variables to ensure that the impact is due to the CSR itself and thus avoid omitted variable bias. To measure financial health and liquidity, I picked four key ratios: *Short term debt* (current liabilities / total assets), *Long term debt* (long-term debt / total assets), *Cash holdings* (cash and marketable securities / total assets) and *Profitability* (net income before taxes / total assets). Higher financial health provides an opportunity to continue investing, while firms with, for example, lower liquidity need to cut their investments when short-term debt is maturing. (Duchin, Ozbas, and Sensoy, 2010).

Firms' other characteristics have also been studied to have an impact on the firm's stock returns (Daniel and Titman, 1997). From other firm characteristics, I controlled company size (logarithm on Market Capitalization), *Book-to-Market* (Assets - liabilities / Market cap) and *Momentum* (Calculated over the last 12 months before the crisis period). If a firm had less than 12 months of close prices data available, I chose to exclude the firms. I also added a dummy for *Negative B/M* companies, if firms have negative B/M they get value one and zero otherwise. For the last controlling variable, I used *Idiosyncratic risk* (Residual variance of the market model over the 60 months before the crisis), due to the positive relation between average stock variance and the market returns. (Goyal and Santa-Clara, 2003).

To estimate CSR's impact more accurately, I added *four-factor loading* (computed over the 60 months before the crisis ending January 2020) to each regression. Four-factor loading is Carhart's four-factor model where momentum is added to the Fama-French three-factor model. (Carhart, 1997). This data is gathered from the Kenneth French data library. (Kenneth R. French - Data Library, 2020)

### *3.1 Main results*

Table 5 column 1 and 2 shows that CSR has a negative effect on the returns. A one standard deviation increase on CSR rating (0.25) decreases raw returns by -2.03 (-0.29% monthly) percentage points and abnormal returns by -1.53 (-0.22% monthly) percentage points. Both returns are statistically significant: Raw returns are significant at confidence level 98.8% and abnormal returns at 96.4%. In columns 3 and 4, I added financial characteristics to the model to ensure that the effect of CSR could not be explained by other financial characteristics.

Columns 3 and 4 show that adding financial characteristics to the regression model does not significantly affect the CSR coefficients. Although, raw returns' confidence level drops to 97.5% and abnormal returns' to 90.5%. Column 3 shows that profitability and cash holdings have had a statistically significant effect on raw returns and abnormal returns during the crisis. One standard deviation (0.11) increase on profitability increases raw return 5,3 % (0.75% monthly) and abnormal return 2,8% (0.39% monthly). One standard deviation (0,147) increase on cash holding increases raw returns by 1,6% (0.22% monthly) and abnormal return by 1,7% (0.24% monthly). These findings are in line with existing literature that shows firms with better financial health faring better during the crisis.

Lins al. (2017) found that CSR had a larger effect when companies had a very high CSR rating compared to firms with a very low CSR rating. In Table 5, I re-estimate the regressions so that firms are divided into quartiles: CSR2, CSR3 and CSR4. The first quartile is a comparison category, the effect of which is captured by a constant term. CSR2, CSR3 and CSR4 are dummies. Table 5 shows that there is not a clear trend in results between each quartile, but the lowest quartile seems to have fared the best. In Table 5 columns 3 and 4, show that the highest CSR quartile (CSR4) has -3.6 %-points lower Raw returns and -1.8%-points lower abnormal returns during the crisis. However, these are not statistically significant.

To better visualize CSR's effect on different levels, I divided firms into deciles by their CSR score. Figure 1 shows that there is a difference between each decile. There is a clear downward trend in returns between Decile 1 to Decile 7, and after that, it seems that the returns bounce back. Neither of these coefficients in Figure 1 are statistically significant.

CSR results are overall in contradiction to what Lins et. al. (2017) found during the financial crisis. I explain the reasons behind these results in more detail in section 4.

**Table 4 – Crisis period returns and CSR**

$$R_{i,t} = \text{const.} + \beta * \text{CSR} + \beta * \text{Financial ratios} + \beta * \text{Four-factor loading} + \beta * \text{State dummies} + \beta * \text{Industry dummies} + e$$

This table shows linear regression (OLS) results, where crisis-period returns act as an independent variable and CSR rating as an explanatory variable. Returns are calculated in two ways, Raw buy-and-hold returns and Abnormal returns over the period February 2020 to August 2020. In the regressing of columns 3 and 4, I have added firm characteristics as control variables. All regressions include *four-factor-loading*, *State dummies* and *Industry dummies*, but I don't report their coefficients. The control variables and returns are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles. Financial ratios are defined in Table 2. T-statistics are in parentheses in the second row. \*, \*\*, \*\*\* indicate the significance at the 10%, 5%, and 1% level, respectively.

	1	2	3	4
	<i>Raw return</i>	<i>Abnormal return</i>	<i>Raw return</i>	<i>Abnormal return</i>
<i>CSR</i>	-0.082 (-2.51)**	-0.061 (-2.10)**	-0.069 (-2.24)**	-0.058 (-1.67)*
<i>Ln(Market cap)</i>			0.001 (1.63)	0.001 (1.18)
<i>Long-Term Debt</i>			0.032 (1.00)	0.042 (0.97)
<i>Short-Term Debt</i>			0.065 (1.45)	0.061 (1.47)
<i>Cash Holdings</i>			0.112 (1.87)*	0.126 (1.97)**
<i>Profitability</i>			0.481 (3.42)***	0.254 (1.80)*
<i>Book-to-Market</i>			0.042 (1.94)*	0.061 (2.02)**
<i>Negative B/M</i>			0.060 (1.07)	0.091 (1.60)
<i>Idiosyncratic Risk</i>			0.001 (-0.04)	-0.082 (-2.36)**
<i>Constant</i>	0.18 (5.04)***	0.12 (3.53)***	0.04 (0.77)	0.01 (0.19)
<i>Four-factor loading</i>	Yes	Yes	Yes	Yes
<i>State dummies</i>	Yes	Yes	Yes	Yes
<i>Industry dummies</i>	Yes	Yes	Yes	Yes
<i>N</i>	1023	1023	1023	1023
<i>Adjusted R2</i>	0.26	0.23	0.30	0.28

**Table 5 - Dummies for CSR Quartiles: Raw and Abnormal Returns**

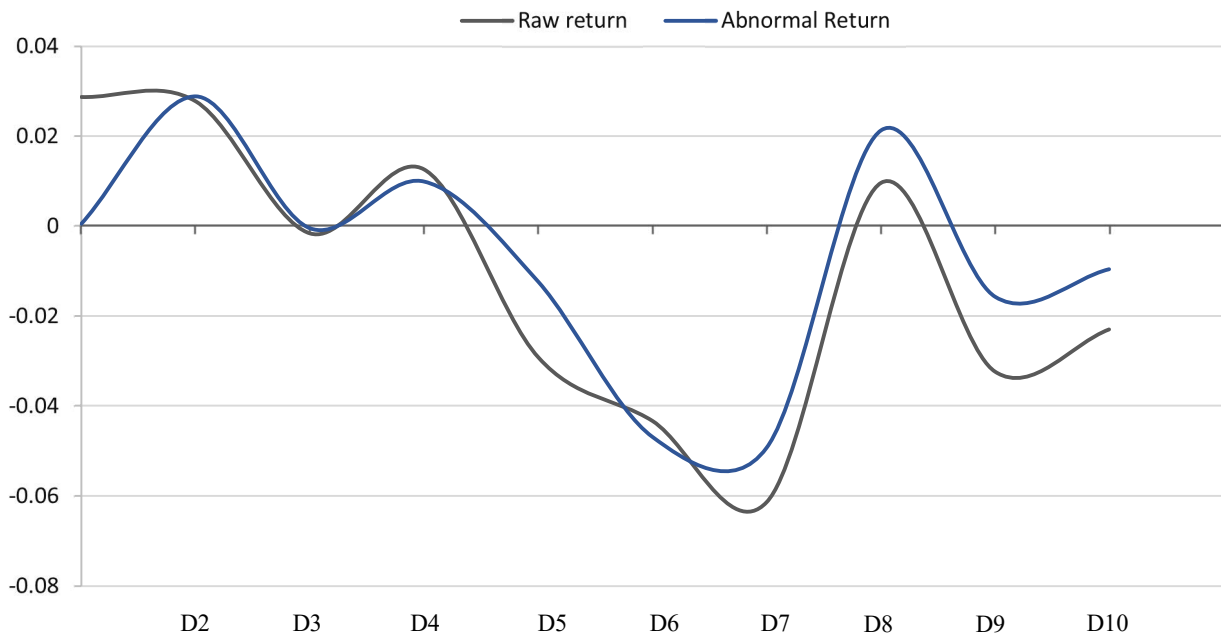
$$R_{i,t} = \text{const.} + \beta * \text{CSR 2} + \beta * \text{CSR 3} + \beta * \text{CSR 4} + \beta * \text{Financial ratios} + \beta * \text{Four-factor loading} + \beta * \text{State dummies} + \beta * \text{Industry dummies} + e$$

This table shows linear regression (OLS) results, where crisis-period returns act as an independent variable and CSR dummies as an explanatory variable. Companies are split into quartiles by their CSR rating: CSR2, CSR3 and CSR4. CSR4 includes firms with the highest CSR. The first quartile is used as a comparison category, the effect of which is captured by a constant term. Returns are calculated in two ways, Raw buy-and-hold returns and Abnormal returns over the period February 2020 to August 2020. In 3 and 4 columns' regressions, I have added firm characteristics as control variables. All regression includes *four-factor-loading*, *State dummies* and *Industry dummies*, but I do not report their coefficients. Financial ratios are defined in Table 2. T-statistics are in parentheses in the second row. \*, \*\*, \*\*\* indicate the significance at the 10%, 5%, and 1% level, respectively.

	1	2	3	4
	<i>Raw return</i>	<i>Abnormal return</i>	<i>Raw return</i>	<i>Abnormal return</i>
<i>CSR 2</i>	-0.032 (-1.25)	-0.029 (-1.07)	-0.022 (-0.89)	-0.021 (-1.86)
<i>CSR 3</i>	-0.075 (-2.72)***	-0.069 (-2.50)**	-0.058 (-2.08)**	-0.057 (-2.04)**
<i>CSR 4</i>	-0.042 (-1.97)**	-0.032 (-1.54)	-0.036 (-1.45)	-0.018 (-0.81)
<i>Ln(Market Cap)</i>			0.00 (1.59)	0.00 (1.18)
<i>Long-Term Debt</i>			0.03 (1.10)	0.02 (1.05)
<i>Short-Term Debt</i>			0.07 (1.58)	0.07 (1.58)
<i>Cash Holdings</i>			0.10 (1.88)*	0.11 (1.98)**
<i>Profitability</i>			0.50 (3.60)***	0.27 (1.96)**
<i>Book-to-Market</i>			0.04 (1.95)*	0.05 (2.01)**
<i>Negative B/M</i>			0.06 (1.12)	0.09 (1.65)
<i>Idiosyncratic Risk</i>			0.00 (-0.13)	-0.09 (-2.44)**
<i>Constant</i>	0.16 (5.09)***	0.12 (3.58)***	0.03 (0.54)	0.01 (0.22)
<i>Four-factor loading</i>	Yes	Yes	Yes	Yes
<i>Region dummies</i>	Yes	Yes	Yes	Yes
<i>Industry dummies</i>	Yes	Yes	Yes	Yes
<i>N</i>	1023	1023	1023	1023
<i>Adjusted R2</i>	0.26	0.23	0.30	0.28

**Figure 1 – Firms divided into deciles by CSR**

This figure shows the linear regression (OLS) coefficient, where crisis-period returns act as independent variable and CSR dummies as explanatory variables. Companies are split into their own deciles by their CSR rating. First decile is used as a comparison category, the effect of which is captured by a constant term. Returns are calculated in two ways, Raw buy-and-hold returns and Abnormal returns over the period February 2020 to August 2020. In the regressions of columns 3 and 4, I have added firm characteristics, *four-factor-loading*, *State dummies* and *Industry dummies* as control variable.



### 3.2 Different elements of CSR during the crisis

I divided the elements of the CSR rating into different parts. I wanted to see how different elements of CSR affect the returns. This is because some parts of corporate responsibility might interest investors more than others. I divided the CSR ratings in two different ways into two categories. First, I divided CSR into an environmental and social category. I used the same weights that I defined earlier in Table 1. This way environmental category gathers 48% of the total CSR score, including resource use and emissions scores. The social pillar makes up the rest, 52 %, of the total CSR score, including workforce, human rights, and community. Table 6, columns 1 and 2, show that environmental aspects of CSR have a larger positive effect on returns than the social side. However, they still have a negative effect on returns.

Another way to divide CSR into two categories was to separate CSR activities into internal and external activities. This helps to estimate categories by their effect on stakeholders. The internal

category includes the workforce because it mostly affects the internal stakeholders. The external category includes emissions, resource use, community and human rights. In columns 3 and 4, we can see that the internal side does have a significant negative effect on returns, which indicates that investors view a CSR focus on external things as more valuable.

Stronger interest in environmental aspects has been shown in the literature earlier as well, Eccles et al. (2011) realized that stronger interest for environmental data could be because it is easier to measure and put into valuation models. With environmental CSR activities or investments firms are also able to save costs by being more cost-effective. With reducing emissions or operating more environmental-friendly before regulation demands can be a competitive advantage and save costs as well. This is due to the fact that policy can change relatively quickly, and it can be cheaper to reduce the emissions than pay for them or the sanctions (Flammer, 2012).

**Table 6 – Different elements of CSR: Raw and Abnormal return**

$$R_{i,t} = \text{const.} + \beta * \text{Element}_1 + \beta * \text{Element}_2 + \beta * \text{Financial ratios} + \beta * \text{Four-factor loading} + \beta * \text{State dummies} + \beta * \text{Industry dummies} + e$$

This table shows linear regression (OLS) results, where crisis-period returns act as an independent variable and CSR elements as an explanatory variable. Returns are calculated in two ways, Raw buy-and-hold returns and Abnormal returns over the period February 2020 to August 2020. All regressions include four-factor-loading, firm characteristics, State dummies and Industry dummies, but I don't report their coefficients. The control variables and returns are winsorized at the 1st and 99th percentiles. Financial ratios are defined in Table 2. T-statistics are in parentheses in the second row. \*, \*\*, \*\*\* indicate the significance at the 10%, 5%, and 1% level, respectively.

	1	2	3	4
	Raw return	Abnormal return	Raw return	Abnormal return
Environment	-0.028 (-0.89)	-0.007 (-0.06)		
Social	-0.089 (-1.82)*	-0.102 (-1.97)**		
Internal			-0.100 (-1.93)*	-0.081 (-1.63)
External			-0.001 (-0.05)	-0.011 (-0.14)
Financial ratios	Yes	Yes	Yes	Yes
Four-factor loading	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
N	1023	1023	1023	1023
Adjusted R2	0.30	0.28	0.30	0.28

### 3.3 Market crash in February 2020 – March 2020

I studied the market crash period between February 2020 and March 2020. I made the same regressions that I did in my main tests (Tables 4 and 5), the only difference being that I focus only on the market crash during 20.02.2020 – 23.03.2020. These are the dates when the S&P 500 started to decline and then hit its lowest point.

In table 7, can be seen that CSR had some positive effect to returns during the market crash but these results are not statistically significant. In appendix 2, I added the full regression tables where it can be seen that firms with better financial health performed better during the crisis. Higher debt ratios have a statistically significant impact during the market crash.

An interesting point is that when we look at only the market crash, it seems like there would be more of a benefit from CSR activities, which would be in line with previous studies. But still, the effect is small compared to results by Lins et. al. (2017) results. I discuss the possible reason behind this more in section 4.

**Table 7 – Market crash**

This table shows linear regression (OLS) results, where crisis-period returns act as independent variables and CSR rating as an explanatory variable in columns 1 and 2 (CSR dummies as an explanatory variable in columns 3 and 4). Returns are calculated in two ways, Raw buy-and-hold returns and Abnormal returns over the period 20.02.2020 – 23.03.2020. In the regressions in columns 3 and 4, I have added firm characteristics as control variables. All regressions include four-factor-loading, State dummies, and Industry dummies, but I don't report their coefficients. The control variables and returns are winsorized at the 1st and 99th percentiles. Financial ratios are defined in Table 2. T-statistics are in parentheses in the second row. \*, \*\*, \*\*\* indicate the significance at the 10%, 5%, and 1% level, respectively.

	1	2	3	4
	<i>Raw return</i>	<i>Abnormal return</i>	<i>Raw return</i>	<i>Abnormal return</i>
<i>CSR</i>	0.019 (1.53)	-0.013 (-0.56)		
<i>CSR 2</i>			-0.019 (-1.72)*	-0.015 (-1.17)
<i>CSR 3</i>			-0.008 (-0.57)	-0.002 (-0.16)
<i>CSR 4</i>			0.014 (0.960)	-0.012 (-1.41)
<i>Constant</i>	-0.30 (-12.77)***	-0.30 (-12.43)***	-0.30 (-13.05)***	-0.30 (-12.67)***
<i>Financial ratios</i>	Yes	Yes	Yes	Yes
<i>Four-factor loading</i>	Yes	Yes	Yes	Yes
<i>Region dummies</i>	Yes	Yes	Yes	Yes
<i>Industry dummies</i>	Yes	Yes	Yes	Yes
<i>N</i>	1032	1032	1032	1032
<i>Adjusted R2</i>	0.45	0.67	0.45	0.67



### *3.2 Robustness tests*

To make sure that my results are robust I performed multiple robustness checks to my adjustments. In the first robustness check, I estimated Corporate governance as a control variable to ensure that the variable does not significantly affect the results. To measure a Corporate governance score, I used the same method that I used in defining the CSR score. The governance pillar includes management, shareholders, and CSR strategy. In Table 8, columns 1 and 2 show that Corporate governance does not affect returns.

After that, I wanted to see if the fact that I excluded micro-caps and financial, medical and pharmaceutical sectors had any effect on the results. In Table 8 columns 3 and 4, we can see that there is little difference between CSR score and results, but I choose to still include these adjustments because of the impact of the Covid-19 and differences in accounting data.

Third robustness check I wanted to ensure that my assumption on weight does not affect the results. I computed the CSR score by using an equally weighted method, where I weigh all the five categories 20 %. This method is useful when investors do not have specific views the importance of each category (MSCI, 2020). I wanted to make sure that I did not make any assumptions about investors' interests during the Covid-19 crisis.

In the last robustness check, I changed the date on which I recorded the CSR score and firm characteristics. In my main study, I use data from the end of 2019 (31.12.2019). I wanted to make sure that if some firms anticipated the upcoming crisis and began adjusting their operations, it would not have an effect on the results. For example, cutting CSR investments would decrease their CSR score. I computed the robustness check with data from the end of 2018.

**Table 8 – Robustness checks**

	Controlling Corporate governance		Including micro and all industries		Equally weighted CSR		Different date for acc. and CSR data	
	Raw return (1)	Abnormal return (2)	Raw return (3)	Abnormal return (4)	Raw return (5)	Abnormal return (6)	Raw return (7)	Abnormal return (8)
Corporate Governance	-0.016 (-0.28)	0.000 (-0.23)						
CSR	-0.110 (-1.96)	-0.001 (-1.498)	-0.081 (-1.71)	-0.068 (-1.40)	-0.115 (-2.43)	-0.086 (-1.81)	-0.103 (-1.91)	-0.086 (-1.43)
Constant	0.059 (0.97)	0.026 (0.410)	0.147 (3.15)	0.100 (2.09)	0.048 (0.93)	0.016 (0.309)	0.046 (0.82)	0.022 (0.36)
Financial characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Four-factor loading	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1002	1002	1464	1464	1032	1032	1019	1019
Adjusted R2	0.303	0.277	0.246	0.205	0.308	0.286	0.304	0.267

## 4 Discussion

In this section, I discuss the possible reasons why CSR why the results are contradictory between the Financial crisis and the Covid-19 crisis. These two crises have their differences, but there have also been similarities in these crises, which makes comparing the results fruitful. One of the most important similarities for the purpose of this study is high uncertainty during the crisis (Cerqueti and Ficcadenti, 2020). The possible main reasons are different effects on economic and financial markets, root causes behind the lack of trust and differences in ESG reporting.

Both crises had an economical hit, but the Covid-19 crisis has been a simultaneous demand and supply shock. Some industries, like transportation, have taken a bigger hit to only their demand. Others, like industrial manufacturing, have been taking hits on the supply while the restaurant sector has taken both supply and demand shocks at the same time (Rio-Chanona, Mealy, Pichler, Lafond and Farmer, 2020). Also, a big difference between these two crises has been the recovery in employment. In the financial crisis, employment recovery was more

simultaneous when during the Covid-19, recovery has been more area-specific. Those states which have managed to control disease better have recovered faster. (The Council of Economic Advisers (CEA), 2020)

Lins et al. (2017) suggest that customer loyalty is one of the reasons why high CSR firms tend to perform better. Albuquerque et al. (2019) show that superior CSR goods have more stable demand across the economic cycle. If we assume that those companies with high CSR goods suffer from supply shock and thus they could not respond to demand, it could be the case that they were not performing so well at the Covid-19 crisis.

The collapse of the financial markets began at end of February 2020. The chart in Appendix 2 shows that the volatility index rose to the highest point since the financial crisis. On March 15, the Fed released an unprecedented quantitative easing (QE) program of \$ 700 billion. Also, the Fed lowered interest rates to zero, thus starting the flow of money into the stock market as there were no safe havens to be found in the fixed income market. (Wade, 2020) The Fed's operations started the rapid rise of stock markets and people's attitudes began to turn positive and euphoria spread to the market. That might also have increased the trust in the financial markets. This may be part of the reason why I found a negative effect of CSR during the crisis when I estimated the period over February to August.

Distrust and fear have been high in both crises, but the root causes behind the lack of trust have been different. The financial crisis was caused by many reasons, but one of the most important was the deregulation in the financial industry. This allowed banks to take advantage of the system by engaging in hedge fund trading with derivatives, which eventually turned into a major financial crisis. The collapse in trust was particularly notable in the financial system and markets (Tonkiss, 2009).

A Rapid pandemic outbreak, such as Covid-19, can arouse great fear in individuals (Moukaddam, 2019). Fear has psychological, economic, and social effects on societies (Madhav et al., 2018). The rapid spread of fear led to hard restrictions which affected the global economy and thus also the financial markets. Distrust in the market began for an external reason when in the financial crisis the reason was more internal. If we assume that the causes have an impact on the level of trust, this could affect the behavior of investors during various crises. And thus, also leads to controversial results.

Perhaps the most logical reason behind the contradictory results may be the fact that we used different sources when measuring CSR. Lins et al. (2017) used CSR ratings from the KLD

MSCI ESG Stats Database when I used the Refinitiv ESG rating. Measuring ESG rating is not so clear when in many cases assessment is subjective.

Berg, Kölbel, and Rigobon (2020) studied the divergence of environmental, social, and governance (ESG) ratings. They compared six rating agencies, also included KLD MSCI ESG and Refinitiv ESG. They identified three sources of divergence: Scope, Weight and Measurement. They found that scope and measurement divergence are the main drivers, while weight divergence is less important. Scope means that different agencies include different things in each category. Measurements mean that agencies measure the same attribute with different indicators and methods. Weight means that agencies can emphasize different categories in different ways, valuing e.g. Human rights more than emissions.

“...researchers may use one particular ESG rating to measure a specific company characteristic (see, e.g., Lins et al. (2017), where KLD ratings were used as a proxy for a corporation’s social capital). In such a case, one would not necessarily expect the same result to be obtained when using another ESG rating...” – (Berg, Kölbel and Rigobon, 2020, p.31)

## 5 Conclusion

This paper studied whether investments in social capital, measured by CSR would affect stock returns during the Covid-19 crisis when overall trust in financial markets was low. I provided evidence that shows CSR activities has a slightly negative effect on stock returns during the crisis, after controlling multiple firm characteristics and other control variables. Regressing raw returns on the CSR and control variable I found that CSR has a statistically significant coefficient of -0.069. A higher level of profitability and cash holdings tend to result in better performance during the crisis. Also, I found that investors seem to value more environmental and external aspects. I also found that in the worst market crash between February to March CSR had a slightly positive effect on stock returns, but these returns were not statistically significant.

This research relied on the Lins (2017) study where they found that CSR activities had a significant effect on returns during the financial crisis. I argued the reasons why these results might be contradictory. The main reasons I presented were the differences in the nature of the crises and varying CSR reporting.

All in all, this study has its limitations. Despite I controlled multiple firms' characteristics and other control variables in my regression models, it is possible that there could be another variable that could correlate with CSR score and thus explain the CSR effect. Also, I mainly focused on large companies which lead to my sample being biased. Even if I made a robustness check where I include micro-caps firms, I noticed that number of micro-caps firms was still very small since they do not have so much ESG data available. It is worth noticing the fact that CSR is difficult to measure due to its abstract nature. Even if ESG ratings are made by rating agencies it does not remove the subjectivity about the ratings.

However, I studied the Covid-19 crisis when the crisis was still on, so in my research, I ran into a problem of lack of updated trust data. For the future, it would be interesting to examine how regional and sector-specific trust would affect returns during Covid-19.

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## Appendix

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### Appendix 1 – VIF test

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Variance inflation factor (VIF) is measuring how much each variable is contributing to the standard error in the regression model. Multicollinearity exist when factor will be over 4. (Oubrien, 2007) This table shows that explanatory variables should not be correlating to each other's. Raw returns and Abnormal returns do not affect my regression result ecause I did not regress them at the same time.

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<i>CSR rating</i>	1.86
<i>Raw return</i>	28.99
<i>Abnormal return</i>	27.79
<i>Ln(Market Cap)</i>	2.40
<i>Long term debt</i>	1.83
<i>Short term debt</i>	1.24
<i>Cash holdings</i>	1.40
<i>Profitability</i>	1.36
<i>Book to Market</i>	1.92
<i>Negative B/M</i>	1.69
<i>Momentum</i>	1.70
<i>Idiosyncratic risk</i>	1.65

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## Appendix 2 – Market crash: Full table

This table shows linear regression (OLS) results, where crisis-period returns act as independent variables and CSR rating as an explanatory variable in columns 1 and 2 (CSR dummies as an explanatory variable in columns 3 and 4). Returns are calculated in two ways, Raw buy-and-hold returns and Abnormal returns over the period 20.02.2020 – 23.03.2020. In the regressions in columns 3 and 4, I have added firm characteristics as control variables. All regressions include four-factor-loading, State dummies, and Industry dummies, but I don't report their coefficients. The control variables and returns are winsorized at the 1st and 99th percentiles. Financial ratios are defined in Table 2

	Raw return	Abnormal return	Raw return	Abnormal return
CSR	0.019 (1.531)	-0.013 (-0.562)		
CSR 2			-0.019 (-1.729)	-0.015 (-1.178)
CSR 3			-0.008 (-0.578)	-0.002 (-0.165)
CSR 4			0.014 (0.960)	-0.012 (-1.411)
Ln(Market Cap)	0.000 (2.588)	0.000 (2.073)	0.000 (2.791)	0.000 (2.313)
Long-Term Debt	-0.155 (-5.046)	-0.135 (-4.298)	-0.153 (-4.966)	-0.133 (-4.227)
Short-Term Debt	-0.066 (-1.531)	-0.060 (-1.373)	-0.059 (-1.365)	-0.053 (-1.214)
Cash Holdings	0.074 (1.868)	0.077 (1.925)	0.071 (1.786)	0.074 (1.840)
Profitability	0.219 (3.690)	0.200 (3.301)	0.227 (3.814)	0.208 (3.420)
Book-to-Market	0.020 (1.424)	0.038 (2.663)	0.020 (1.430)	0.038 (2.662)
Negative B/M	0.075 (3.098)	0.073 (2.946)	0.075 (3.097)	0.073 (2.946)
Idiosyncratic Risk	0.024 (1.580)	0.019 (1.189)	0.023 (1.492)	0.017 (1.102)
Constant	-0.303 (-12.77)	-0.300 (-12.43)	-0.304 (-13.05)	-0.300 (-12.67)
Four-factor loading	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
N	1032	1032	1032	1032
Adjusted R2	0.45	0.67	0.45	0.67



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## Appendix C – Volatility index

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The CBOE Volatility index is measuring forward looking the implied volatility. Volatility index is also called as a fear gauge. Calculated from daily close prices from Yahoo finance (2020). T1 is financial crisis (August 2008-March 2009). T2 is CVoid-19 crisis (February 2020- August 2020)

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