CSR AND FIRM PERFORMANCE

AN ANALYSIS OF THE IMPACT OF CSR DURING THE COVID-19 MARKET CRASH OF 2020

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Abstract:

The COVID-19 virus induced a financial market crash, between February 20th to March 23rd of 2020, during which governments were in a hurry to create aid packages, often touted as green restarts. Therefore, is it studied whether corporate social responsibility (CSR) investments pay off for companies during a stock market crash. The study uses the quantitative research method of cross-sectional regressions and utilizes robustness tests to confirm results. In addition, an industry analysis is conducted to deepen the understanding of the result. In conclusion, the results show no general impact of CSR during a financial market crash, however CSR ranking had two short-term effects on firm performance, during the fall it had some negative impact, while having a positive impact during the initial recovery. Thus, the results do not confirm the hypothesis that CSR is beneficial during times of crisis.

Keywords: Corporate social responsibility, COVID-19 crisis, Firm performance, Shareholder value, CSR and crisis performance

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1. Introduction

Background and relevance

In the year of 2020, the world was struck by a pandemic, killing millions (SVT, 2021). The virus known as SARS COV 2 changed the landscape of human interactions. Not only was trade made difficult, but the labor market stability was also severely affected. With consumers' financial stability damaged and the physical trade possibilities decreased, numerous companies experienced massive losses of revenues, many facing bankruptcy. Governments responded to firms' dramatic loss of cashflow due to restrictions by labor payouts and loans. Each country had their own rules for firm's support qualification. Some countries required firms in need for larger economic aid packages to align with the governments' goals. An example is the financial aid that Scandinavian Airlines received from the Swedish government in 2020 (Johansson, 2020), which requires a reduction of carbon dioxide emissions in half.

The economic recession that followed the outbreak of the virus was accompanied by a market crash where the S&P 500 index fell over 30 percent in less than a month, once again manifesting the fragility of financial markets. Recently, many young and inexperienced investors have entered the market (Brännström, 2021), and combined with retail investors having access to complex products that previously were limited to institutional investors, which constitutes a larger vulnerability for investors. Protecting non-institutional and institutional participants from the largest downside risks increases the necessity of understanding the dynamics, and traits of financial market crashes. This is especially important since Unesco foresee increased severity and frequency in pandemics unless loss of biodiversity is addressed (Unesco, 2020). Therefore, this paper focuses on the role of corporate social responsibility (CSR) as a dampening variable by examining its impact on firm performance during the COVID-19 financial market crash.

In later years, CSR has come up more and more on the agenda as an important aspect in relation to business, and this was amplified with the COVID-19 market crash. CSR was one of the most highlighted aspects in many government's economic recovery plans and the Organisation for Economic Co-operation and Development advocates for countries to focus on a green recovery (OECD, 2021). Another example is the EU recovery package, amounting to 750 billion euros, which is said to be closely aligned with the European Union's long-term sustainable goals which include making the union more green (European Union). Considering this increased focus on CSR in recovery packages, it provides an opportunity to test CSR's impact on firm performance in times of a market recession.

However, opinions diverge when it comes to how CSR should be tackled in business. Already in 1970 did Milton Friedman argue in his article "A Friedman doctrine-- The Social Responsibility Of Business Is to Increase Its Profits" that "A corporation is an artificial person and in this sense may have artificial responsibilities, but "business" as a whole cannot be said to have responsibilities," the argumentation deliberates that CSR is something principals choose as opposed to agents, which means that a unanimous agreement would be necessary from all shareholders to not breach the principal's rights

to sustain. Following the argumentation in the article means that the executive that, as an agent, engages in CSR is equivalent to taxing the shareholder. However, the article also recognizes that "Of course, in practice the doctrine of social responsibility is frequently a cloak for actions that are justified on other grounds rather than a reason for those actions." Drawing on the conclusions of the article, Friedman thinks that CSR can at most represent a firm's dedication to long-term profits, while in worst case it reduces shareholder value, due to inefficiency because of an agency-problem.

Other articles are more positive about the role of CSR in business. Lins et al. (2017), for example, find evidence that good CSR is important in times of low institutional trust, which often occurs in connection to financial recessions. Lins et al. concluded that in times with low institutional trust, such as in the time of a market crash, CSR is an important way for companies to show investors their trustworthiness. In a market crash such as the housing market crash in the United States, the crash depended heavily on a flawed regulatory system that allowed the market to "deteriorate from the inside", which dealt a huge blow towards the trust that the market had built up. Bae et al. (2021) do a similar test where they look specifically on how CSR impacted firms during the 2020 COVID-19 market crash and find no impact of CSR. Another report using similar concepts as Lins et al. (2017) is one written by Schinetz and Epstein (2005). However, it instead researches how the aspects of corporate reputation and social responsibility affected firm performance during the failed 1999 Seattle World Trade Organization meeting. Specifically, the authors argue that the reputation for being socially responsible should make firms perform better during a crisis, where the benefit of reputation comes from the isolation of the market decline, rather than increased financial performance. The report shows that firms with a reputation for social responsibility were protected from stock decline during the event. Corporate reputation for being socially responsible has a strong similarity to social capital and trust as discussed by Lins et al. (2017), as both are grounded in how investors view the trustworthiness of firms from a non-financial perspective.

The topic is interesting to study, since even with a heightened interest -opinions are still ranging from CSR being detrimental, to irrelevant, to beneficial. We hypothesize that CSR is a signaling tool and thus should have a positive impact on firm performance during the 2020 COVID-19 market crash. To test this hypothesis, we draw on the methodology used by Lins et al. (2017), as opposed to Bae et al. (2021), and import CSR data on 460 US stocks from the Refinitiv Eikon website. The index we get from Eikon is then used as the exogenous parameter in our regressions where raw return and abnormal return are the endogenous variables. In addition, we control for various control variables and perform an industry analysis, as well as running some robustness tests.

We find that CSR has had some statistically significant impact on firm performance during one of three periods we investigate. More specifically, we find the strongest impact in the initial rebound period of the market. The other periods show no clear impact of CSR although there is some evidence that CSR has had a negative impact during the fall of the market. This is contrary to what has been found in previous research and only substantiates the yet unknown complexities of financial markets.

Research question

The research question that is pursued in this paper is whether CSR pays off for companies during a market crash. The crash in focus in this paper is the COVID-19 financial market crash, which occurred between February 20th to March 23rd of 2020. This topic is important to research since companies need to know how their investments in CSR activities are reflected in the market during a crisis, and it is also important to understand how to better protect investors from the largest downside risks, especially with financial crises possibly increasing due to growing insecurity in the world. In addition, due to the limited measurability of CSR, finding concrete effects of CSR during specific times could help companies better understand the cost – benefit relationship of CSR investments in general.

Contribution

The contribution of this paper is in deepening the knowledge of specific dynamics in the way that corporate social responsibility influences firm performance. Many studies have been made on this subject but are based on slightly different theoretical frameworks. Our definition stems from the pure definition of CSR, based on an increase in importance of CSR in economic activity. Among the studies that have the same basis as us in the dimension of corporate social responsibility, no other study has the deepened view that we offer through our unique event window definition with three main event windows. We also believe our focus on the COVID-19 crisis is of great contribution since the United Nations foresee an increased frequency and severity in pandemics.

Scope

The paper focuses on periods surrounding the COVID-19 financial market crash, and finds evidence that CSR has an impact during a certain part of the crisis, but research about other pandemics or similar market crises is beyond the scope of this paper. And whereas we would like to go deeper into the role of government intervention in CSR impact on firm performance, unfortunately our data is too limited to perform such an analysis. Should someone continue research based on our paper, we believe an interesting starting point would be to research how periods of government market mediation, both financial and regulatory, impacts the role that CSR plays for firm performance.

Disposition

The rest of this paper is structured as follows: Section *2* discusses the related literature of our thesis. Section *3* discusses the theoretical background. Section *4* discusses the methodology pursued in detail. In section *5*, we manifest summary statistics of our data as well as discuss the data sources we use. In section *6*, we showcase our results and discuss the implications. Section *7* concludes the paper and section *8* contains the references.

2. Related literature

There have been numerous studies researching the link between corporate social responsibility and firm performance. Schnietz and Epstein (2005) asked the question "Is there financial value in a reputation for corporate social responsibility during a crisis?" and did this by looking at whether reputation for social responsibility acted as a dampener of goodwill during the 1999 Seattle World Trade Organization (WTO) failure. The findings in the paper shows that a reputation for social responsibility protected firms from stock declines associated with the WTO crisis.

Margolis et al. (2009) published a meta-analysis consisting of 251 studies that tries to answer the question firms ask themselves; "Does it pay to be good?". This is done by investigating the empirical link between corporate social performance (CSP) and corporate financial performance (CFP). Their findings show that a small positive effect can be found. Furthermore, in august 2017, Lins, Servaes and Tamayo published their article about social capital in the journal of finance. In their article, they explore how social capital is economically important for firms during times of low trust. Due to lack of trust in financial institutions, investments are more inclined to be made towards firms that are considered to be trustful. Corporate social governance plays a big part in creating trust, and so, they explore in their article how companies with high CSR performed better during the financial crisis of 2009. On the other hand, a contradicting article was published in the Journal of Corporate Finance (Bae et al.), which used similar empirical methods but using data from the 2020's COVID-19 crisis. Bae et al. finds no correlation between CSR and financial performance, and only little to no correlation when CSR is congruent with the firm's institutional environment.

Our thesis uses the methodology of the research article written by Lins et al. (2017), while using a similar, yet more complex, time series as Bae et al. (2021) - the authors of the contradicting article. By building on the methods by Lins et al. (2017) and researching the same time series as Bae et al. (2021), the thesis expands the current knowledge of CSR and its impact on firm performance during crisis periods. In addition, the thesis discusses social capital's, corporate reputation's, and CSR's impact on firm performance during times of crisis. This develops on the research done by both articles but gives the research a needed assessment due to the contradicting results. Additionally, it deepens the knowledge about the crisis period since an additional time series is added compared with Bae et al. (2021). The validity of CSR as a risk minimizing factor is as much an ethical as an economical dilemma of investing. Hence the legitimacy of CSR becomes ever more important considering the increasing global conflicts and the forthcoming hardships associated with future crises.

3. Description of empirical background

Corporate Social Responsibility

Corporate Social Responsibility (CSR) has been defined by the European Commission as "a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis" (European Commission). As a self-regulated business practice CSR previously often only included charitable acts and sometimes only the intention of corporate or social responsibility. However, this has changed. Companies are instead being held to higher standards where self-regulation on its social and environmental impact is being tract and considered by customers before engaging in commerce (Business for good). However, a point to mention is that CSR reports are sometimes named sustainability reports, which is somewhat misleading. The phrasing sustainability report might only be associated with environmental sustainability and not the social facets, which also hold a great deal of importance for CSR. A typical CSR report is published annually and might include aspects such as; a presentation of the corporate structure, an industry-specific sustainability context, a firm-specific risk assessment, and a stakeholder map (Youmatter).

The history of CSR is long, and even though it only started to become an important part of business in the late 1900s, mainly through Edward Freeman first detailing the framework in 1984, it started way back in the 1800s (*Stakeholdertheory.org*). Stakeholder theory tells us about the importance of the interconnecting relationships between business, and, put frankly, everyone else. It highlights the importance to not only take the stockholders into account, but to also think about how the business affects all other actors affected by the business operations. This can be the state, the climate, the local population etc. To maximize firm value, firms first need to rethink the term "firm value" and identify what negative consequences pure value maximizing has. The firm must then do what it can to mitigate those effects and provide value for all stakeholders. Every stakeholder must hold equal consideration from every invested dollar in the firm. This is starkly different from the neoclassical value maximizing theory. Rooted in economic theory, it tells us that firms simply need to think of their long-term firm value to be socially efficient (Jensen, 2001). Every invested dollar should give as many dollars as possible back in the future.

Both theories have fundamental problems that make them hard to use practically. But one does not have to believe any of these two theories fully to see the importance of corporate social governance in firms. In his 2001 paper on enlightened value maximization, Jensen criticizes both theories for not being socially efficient in practice. According to him, neoclassical value maximization does not take care of negative externalities, and stakeholder theory provides no map on how to make trade-offs between different stakeholders. But even Jensen sees the importance of good CSR, as his proposal of "enlightened value maximization" is rooted in the idea that firms need to be incentivized to not focus on short-term benefits at the expense of other stakeholders. Whereas he does not agree with the sweeping declarations of Stakeholder theory, he stresses the importance of corporate social responsibility in business. Since the 1980s,

there has been a big rise in the prevalence of stakeholder theory in business discussions (Stakeholdertheory.org). This shows the importance for businesses to combine the interests of the social good in their business and to act in a value-enhancing way in both dimensions in order to support sustainable development.

We argue that there are different types of CSR. Generally, we believe that a firm with a business model that creates positive externalities or creates a smaller amount of negative externalities than a comparable firm has a higher level of CSR and will get more preferential treatment from the government as a result of this (Goolsbee, 2016). We also believe that a firm that CSR can be enacted in another way, namely through altruistic motives such as sponsoring local kids' sports organizations or donating money to sustainability projects. Both these types of CSR are important to companies if they want to be perceived to have good CSR. However, if a company fails to communicate its positive CSR activities, it generally cannot be perceived as having good CSR by the general public and by investors. Rim et al. (2016) find that there are several important aspects to communicating CSR. Firstly, they find that a company's previous reputation deeply affects how their CSR activities are perceived. If a company already has a good reputation with regards to CSR, continued activities will be viewed more positively. Furthermore, they find that a company's motives pertaining to CSR activities are important. Performing CSR activities is not enough to be perceived to have high CSR. Rather, a company needs to show that one has altruistic motives when performing CSR activities.

This all relates to a fundamental problem when it comes to doing research on CSR. Namely, that it cannot be measured easily. If a company invests more in production control, it can be seen in the financial reports, and one can be fairly certain that in general, the investment will lead to more rigid control of production and that the company will have less problems with faulty products. An investment in CSR, however, is more difficult to assess. First of all, due to the nature of CSR, it is very difficult to measure. There is no single measure that tells the level of CSR activities of a company, and thus, its measure is inexact, as suggested by Lins et al. (2017). It is also difficult to measure a company's change in CSR over time, and it is difficult for companies themselves to assess how much they need to invest in CSR and what they will be gaining from their investments. These problems relate to the use of CSR as a measure of social capital, which is why we outsource the assessment of CSR to experts. However, it also relates to how companies need to communicate their CSR efforts. We believe a key in this is signaling.

Signaling

Markets are filled with information asymmetry, which means that all market participants do not have the same information. Therefore, most companies engage in the action called signaling, which is a tool to express some privately held information. This needs to be quite costly since it almost always is being used to inform a less informed actor of a firm's comparably higher quality to its competitors. This is the result of a situation where something otherwise could not be understood by the public information that has been provided. A signal can be clearly stated during a press release or subtly hinted by the actions taken by the firm. However, since firms only engage in

signaling when it is beneficial for its image, inversely firms that do not partake in signaling might show their inferior quality. This is why signaling most be quite expensive and still is a useful tool for revealing information. We argue that to engage in CSR is a form of signaling, since it can be quite expensive and difficult to fake, which greenwashing is an example of. The difficulty of faking a CSR report does not come from the first report. Instead, it is the following reports that easily exposes firms that do not take CSR seriously, since the metrics and reported numbers often changes to frame the firm in the best light. An example of this behavior is the Danish pharmaceutical company "Novo Nordisk", who reported the metrics "Wastewater" and "Chemical oxygen demand in wastewater" in their sustainability report 2012, but quietly removed the metric in 2014 (Novo Nordisk Financial report 2012 pp. 101 and 2014 pp. 102). Since the metrics are unlikely to be less important in 2014 than in 2012, this raises concerns about the motives for removing and about the transparency in sustainability reporting of the company.

The thinking is also that a firm that already partakes in CSR might have a more favorable treatment when seating regulatory approval, stemming from microeconomic theory. Companies that already works in line with the government's goals will have it easier to receive funding for new initiatives. Additionally, such firms should also have an easier time facing new environmental regulations, since their business will already be fully or partly adapted to the new regulation, something that is harder for a firm without good CSR. To conclude, a firm that already has proven that they are trustworthy through using expensive signaling, which should result in a higher CSR score, should have an easier time dealing with both the general public and the state.

CSR in Corporate Valuation

In this paper, the firm value of CSR can be derived from the argument that a firm's CSR score is a result of reliability and cooperation. Therefore, a firm with a history of being cooperative and reliable will gain more from situations when this is more significant, such as when state interventions are unclear. Furthermore, it is posited by Guiso, Sapienza, and Zingales (2008, p. 2557) that from the shareholders perspective "the decision to invest in stocks requires not only an assessment of the risk-return trade-off given the existing data, but also an act of faith (trust) that the data in our possession are reliable and that the overall system is fair." Hence, the argument of this paper is that in times of high state intervention uncertainty, as in crisis, investors will look towards ratings that shows a firm's reliability and cooperation with its stakeholders. This argument is consistent with the notion of reciprocity, that stakeholders willingness to cooperate increases with the perception of firms reliability (e.g., for employees, see Guiso, Sapienza, and Zingales (2015); for customers, see Servaes and Tamayo (2013)). It is thus argued that reliability and cooperation results in high CSR scores and that an evaluation premium is observed for these companies during crisis periods, since this is the time of highest state intervention uncertainty.

4. Methodology

In conducting our analysis, we follow the method of Lin et al. (2017) closely. However, due to some technical issues we have encountered, we have had to do some deviations from their method. In creating our sample on CSR, we use the screener app on the Eikon database. Whereas Lin et al. use the MSCI website to gather information on corporate social responsibility, we did not have access to that website, so Eikon was a good substitution. Eikon grades companies based on corporate social responsibility on a scale from 0 to 1, with 0 being the lowest score (bad CSR) and 1 being the highest score (high CSR) a company can get.

Our raw dataset contains over 2700 companies, but the data is then modified to become a credible sample. We focus our analysis on the American stock market due to its high liquidity, so we remove stocks of companies that are not based in the United States. Financial firms are excluded due to the extensive financial support from the government they traditionally get in times of crisis. Due to liquidity issues, we remove the so-called micro-stocks, that is to say the stocks with a market capitalization of less than $250 000 000. Lastly, we remove stocks that have no value on corporate social responsibility. Other than completely missing values, i.e. values classified as "N/A", we also remove stocks that have the value "0.000". The reason for this is because we believe it is unlikely for a stock to have the CSR-value of exactly 0. Even a stock with low CSR should, in most cases, have a higher value than 0. Of course, some industries, like the weapon industry for example, could be said to have low CSR naturally, but we have already omitted such industries where the only thing a firm could do to improve their CSR is to leave the industry. Therefore, we believe it fit to leave out stocks that have the CSR value of 0, aware of the risk that we remove a stock that has a true CSR value of 0. This is also because the "0" CSR score stocks are so numerous and would severely distort the analysis if included.

To calculate one of the key measures in our analysis, we employ *event studies* methodology. Namely, we use the market model of the event study branch of finance, which assumes that a stock's return is linearly related to the return of the market. As explained by McWilliams and Siegel (1997), the relationship between firm return and market return is expressed as

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}$$

where R_{it} is the return for firm i on day t, α_i is the intercept for firm i, β_i is the coefficient for firm i, R_{mt} is the market return on day t, and e_{it} is an error term for firm i on day t, which is assumed to be normally distributed with a mean of 0. The abnormal returns for a given day are then expressed as

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

where AR_{it} are the abnormal returns for firm i on day t. The intercept α_i and the coefficient β_i are computed by running a regression on firm returns during an estimation period before the unanticipated event. In our methodology, we use an estimation period

of 60 months (5 years) from September 30th 2014 to September 30th 2019, and we use the S&P500 index as our market return.

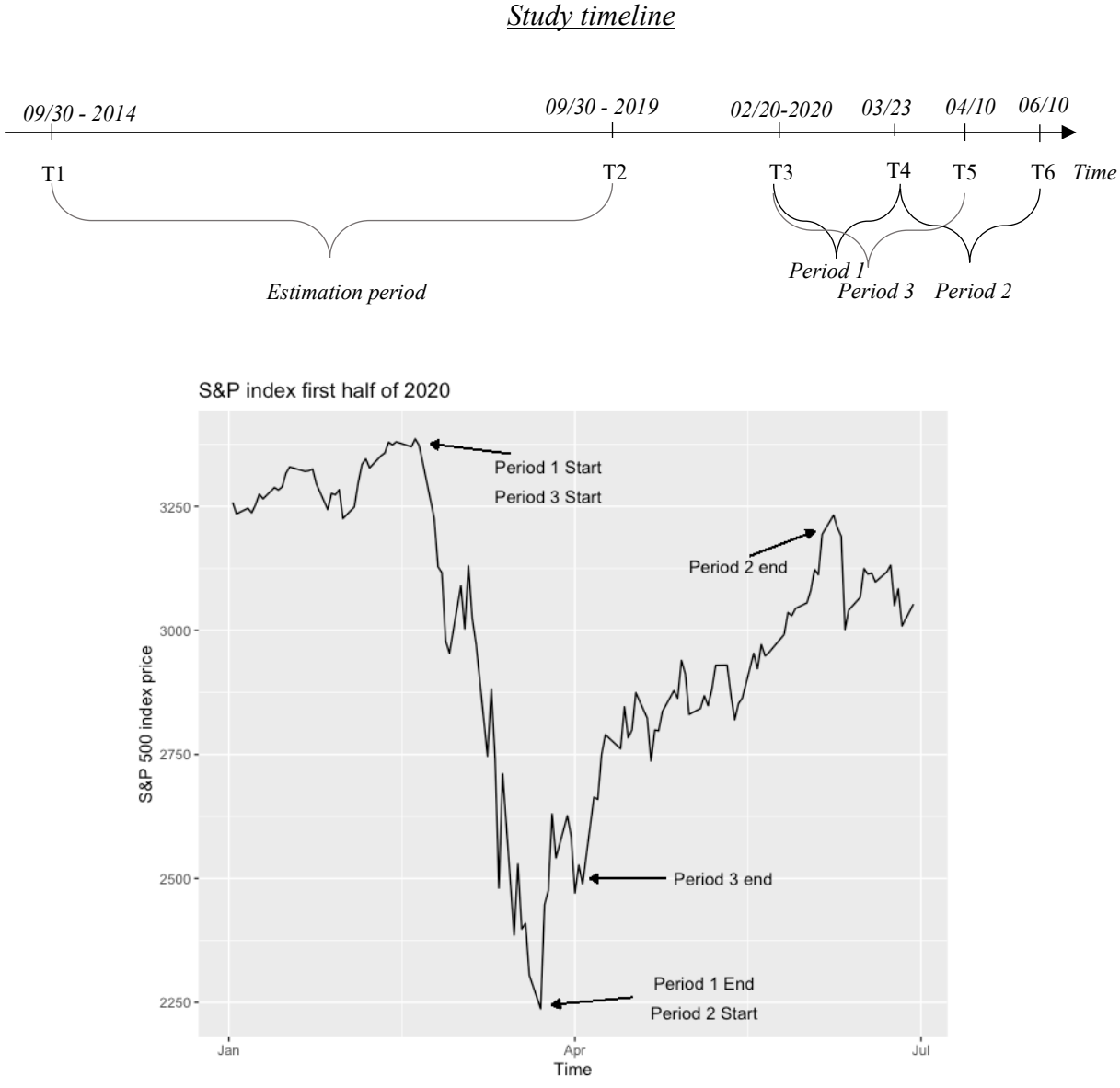
When using the event study methodology, as McWilliams and Siegel (1997) express, there are several important assumptions to consider. First of all, regarding whether it is reasonable to use the methodology or not, one must address three concerns. Firstly, markets must be assumed to be efficient, which we assume them to be. Secondly, the event must be unanticipated. Considering that the spread of coronavirus came very abruptly, it is sensible to assume that, for the majority of the investors, the event was unanticipated. One could argue that the spread in the United States could be foreseen, or predicted, already in January when the virus spread in Wuhan in the Hubei province of the People's republic of China, but considering that the market reached its highest point in history just days before, assuming that the event was unanticipated is in order. Thirdly, it is important to think about confounding events. This is always important when doing an event analysis, as the idea with an event study is to isolate the effects of one event. In this case, even though our event window is relatively long (to be discussed below), due to the complete defocus of everything except the coronavirus in the early days of the global spread, we believe that there are not any major events that will have confounded the event that we analyze.

Furthermore, one must be careful when determining the main event window. As we have already indicated, we have relatively long event windows, ranging from 28 to 75 days. As McWilliams and Siegel (1997) explain, markets are in general very quick to reflect new information, and therefore short event windows are preferred as they are more likely to isolate the effects of the studied event. They go on to say that the nature of the event is what has to determine the length of the event window. We investigate three different event windows all related to the same underlying real-world event. The longest is well over two months and the shortest is about one month, which is motivated by the length of, complexity during, and uncertainty of our event. We discussed having the main event window end when the S&P500 hit its lowest point, but as there were economically important events happening after that (economic subsidies to impacted firms for example) as well as continued uncertainty, we decided to add instead add several event windows to expand our analysis in order to understand the dynamics of the event deeper. Even though there was still a lot of uncertainty about the future at the bottom of the crisis, we believe most investors had already understood what kind of impacts the crisis would have on the future of economic interactions, so extending the main event window even longer would mean an increased risk of confounding effects. Thus, we instead decided to keep an additional window reserved for the recovery period. Figure 1 shows a schematic timeline of our study.

Figure 1

Study timeline

This figure (1) shows a schematic timeline of the study. First, a timeline of our study is shown, and underneath a graph of the S&P 500 index during the first part of 2020. We use abnormal returns in our analysis, and our estimation period is the five years period starting September 30th 2014 and ending September 30th 2019, marked as between T1 and T2. The estimated values are then used to calculate the abnormal returns during period 1, period 2, and period 3. Period 1 is the "Top-bottom" period, where the market when from its highest level to its lowest, ranging from February 20th, 2020, until March 23rd, 2020. Period 2 is the recovery period happening after the market crash, where the market recovered much of its value, from March 23rd, 2020, until June 9th, 2020. Period 3 is the "top-bottom" extended to include the initial recovery period, defined from February 20th until April 9th.



Our measures for the period are *crisis period return* and *crisis period abnormal return*. As mentioned, we use the market model to calculate the abnormal returns for the period. We run cross-section regression analysis on the two measures with CSR score as the exogenous variable and return as the endogenous variable. In order to avoid outlier problems, the return variables are winsorized at the 1st and the 99th percentiles.

To create control variables, we also get accounting data from the COMPUSTAT database. We collect the data as close to the start of the crisis period, which is the annual report of the fiscal year 2019 for all companies. When it comes to accounting data, the size of the company will directly affect the magnitude of each accounting measure. To avoid magnitude problems when running regressions, we create a fractional measure by relating each variable to the total book-value of the company. That means that, for long term debt for example, the measure variable for a given company is calculated as,

$$\frac{Long\ term\ debt_{2019}}{Total\ book\ value_{2019}}$$

In addition, market capitalization, which is used to represent size, is logarithmized. All the control variables are chosen based on theory of how they might affect a business during a crisis. However, the measure pertaining short-term debt is defined as long-term debt due in one year. Whereas we are aware that this is not the optimal measure for short-term liabilities, according to us it is the best way to capture the concept using the variables that COMPUSTAT provides. Another difficult measure is profitability. Profitability is usually referred to as a category of key-ratios, rather than as a single key-ratio. However, due to us wanting to keep things simple and focus on the financial theory rather than the accounting theory, we employ the simplest definition of profitability, that is, the profit margin,

$$\frac{Gross\ profit_{2019}}{Total\ revenue_{2019}}$$

Over a large population, one might observe cases where firms do not report gross profit. Out of all the firms we analyze, however, we did not find any case in which the gross profit was missing, so adjustments were not necessary. Thus, after cleaning the data, we end up with a sample size of 460 nonfinancial stocks.

5. Data

Data source discussion

Our data sample is created through importing data from several different databases. Firstly, our data on corporate social responsibility is imported from the screener app in Refinitv Eikon. Originally, we were planning to use the MSCI ESG database, but due to accessibility limitations, Eikon was a good alternative as it has over 150 analysts gathering and evaluating ESG data (Eikon). Our sample on American stocks originally contained over 2000 stocks. However, since we were mainly interested in the CSR variable in the data, by removing the firms missing a CSR data point the sample shrunk to only just under 500 stocks. After removing some sin industries and other unwanted firms (micro-cap firms etc.) we end up with a sample of 460 firms. This is a limitation in our thesis, as both the articles of Lins et al. (2017) and Bae et al. (2021) had significantly larger samples (over 1600 firms). This becomes a limitation especially in our industry analysis, as there are few stocks in each industry.

Next, our data on stock prices are collected from the center for research in security prices (CRSP) daily file database. CRSP is a research-oriented database on economics and finance and is used by nearly 500 academic institutions in over 35 countries (CRSP, 2021). The structure of the data is very practical and is used by other articles written on the same subject. Lastly, our accounting data, which is used when calculating control variables, is imported from the COMPUSTAT website, which is part of the S&P Global Market Intelligence solution offering. It provides accounting data on over 33 900 active and inactive publicly held companies (WRDS). This database is also used by other articles on the same subject and does not have any real limitations since companies covered are so numerous. Of course, when handling accounting data, one must always be mindful of the accounting issues that might come up from companies using different types of accounting methods. However, S&P Capital IQ adjust the accounting data on the platform to enhance comparability between firms (S&P Global).

Data description

Table 1 shows descriptive statistics for our main variables. As mentioned earlier, our two main performance measures are “Raw return” and “Abnormal return”. We have collected values from our three periods in the same table. Raw return from period 1 is, as expected from times of financial crisis, negatively skewed, with a mean of -0.437 and a standard deviation of 0.177 and the first and third quartile values being negative at -0.562 and -0.324, respectively. Our second main measure, “Abnormal return”, is also skewed negatively during period 1, albeit less than the raw return. The mean is -0.090, with the first quartile value being -0.221 and the third quartile value being 0.021, and the standard deviation is 0.191. This tells us that the stocks in our sample performed worse than the market on average during period 1. In period 2 we see very positively skewed statistics. Raw return has a mean of 0.680 and a standard deviation of 0.561. Abnormal return has a mean of 0.372 and a standard deviation of 0.526. During period 3, which also is a crisis period but with the initial recovery period included, we also see negatively skewed results, with a mean of -0.291 and a standard deviation of 0.203 in terms of raw return, and a mean of -0.114 and standard deviation of 0.189 in terms of

abnormal returns. Our main endogenous variable is the CSR score, which is an index ranging from 0 to 1. The mean of this is 0.465, meaning that the average firm is more negative than positive in terms of CSR scores, which, even if the index creation methods differ, is consistent with Lin et al.'s (2017) findings in their sample. The standard deviation of the CSR value is 0.284, and the 25th percentile is 0.245. This differs slightly from our second measure of CSR, namely our ESG score variable.

Table 1

Descriptive Statistics

This table (1), presents summary statistics for the main variables in our analysis, as well as the control variables. The data sample contains 460 American firms from the Eikon ESG database. Financial firms are excluded from the sample, as well as firms in industries with naturally low CSR scores such as the weapon industry and micro-cap firms (market cap < $250 million). The table contains two panels; panel A and panel B. Panel A includes summary statistics for our main variables and panel B contains a correlation matrix of all the variables where half of the matrix (the doubles). Panel A includes the statistical measures "Mean", "Standard Deviation (Std Dev)", "the First Quartile (Q1)", "Median", and "the Third Quartile (Q3)", arranged as column headings. P1 Raw Return is the gross return for period 1, the "Top-bottom" period between February 20th and March 23rd. P1 (Period 1) Abnormal Return is the abnormal returns, computed using the market model over a five years' estimation period. The remaining returns for P2 and P3 are formed the same way as for P1. P2 was from March 23rd, until June 5th and P3 was from Feb 20th – April 10th. These returns are the dependent variables we are analyzing, and underneath come the control variables. First, there is Board Size. Second, there is Cash on Hand, calculated as a ratio between cash and total assets. The accounting measures Short term debt and long term det are also computed as a ratio with total assets in the denominator. Market Cap (size) is the logarithmic market capitalization before the event, used to represent size. The last control variable is Profitability, which is the gross profit margin. Lastly, there is CSR Score, which is our main independent variable. It is an index ranging from 0 to 1, where 0 is the lowest possible CSR score a company can attain, and 1 the highest. This variable is determined externally, by the database Refinitiv Eikon.

Panel A	Mean	Std Dev	Q1	Median	Q3
P1 raw return	-0.437	0.177	-0.562	-0.424	-0.324
P1 abnormal return	-0.090	0.191	-0.221	-0.097	0.021
P2 raw return	0.680	0.561	0.346	0.554	0.849
P2 abnormal return	0.372	0.526	0.084	0.275	0.517
P3 raw return	-0.291	0.203	-0.417	-0.269	-0.155
P3 abnormal return	-0.114	0.189	-0.227	-0.089	0.005
Board size	9.79	2.164	8	10	11
Cash on hand	0.084	0.098	0.018	0.05	0.116
Short term debt	0.026	0.046	0.006	0.013	0.032
Long term debt	0.33	0.222	0.198	0.321	0.425
Market cap (size)	22.505	1.735	21.316	22.401	23.653
Profitability	-0.195	12.553	0.248	0.379	0.522
CSR score	0.465	0.284	0.245	0.44	0.69

CSR score	*Profitability*	*Board size*	*Long term debt*	*Short term debt*	*Cash on hand*	*Market cap (size)*	*P3 abnormal*	*P3 raw*	*P2 abnormal*	*P2 raw*	*P1 abnormal*	*P1 raw*	***Panel B***
0.022	-0.024	0.121	-0.088	-0.029	0.182	0.309	0.866	0.901	-0.639	-0.66	0.745	1	***P1 raw***
-0.033	-0.049	-0.041	-0.131	-0.035	0.351	0.204	0.782	0.602	-0.451	-0.346	1		***P1 abnormal***
-0.032	-0.044	-0.102	0.101	-0.052	-0.068	-0.168	-0.45	-0.547	0.982	1			***P2 raw***
-0.019	-0.038	-0.063	0.122	-0.054	-0.13	-0.152	-0.466	-0.504	1				***P2 abnormal***
0.096	0.003	0.188	-0.084	-0.034	0.152	0.406	0.949	1					***P3 raw***
0.079	-0.011	0.128	-0.114	-0.038	0.255	0.392	1						***P3 abnormal***
0.452	0.048	0.489	-0.014	-0.039	0.189	1							***Market cap***
-0.054	-0.099	-0.036	-0.219	0.096	1								***Cash on hand***
-0.034	0.008	-0.007	0.134	1									***Short term debt***
0.067	0.044	0.064	1										***Long term debt***
0.385	-0.002	1											***Board size***
0.051	1												***Profitability***
1													***CSR score***

6. Empirical results, Findings, and Interpretation

In this section we present the results from our analysis. We also interpret them in this section as well as reflect on how they impact the current literature and knowledge. The results are formed through running regressions on our main variables, as well as including control variables to control for various confounding factors. The regression method used is the cross-sectional regression method. The reason that this is used is because it is suitable to use on the type of data that we have; with one data point for each stock. The regression results from our first period, *Period 1*, are collected in *table 2*. Shown are the size of coefficient (under *estimates*) for each variable (under *predictors*), the P-value that the coefficient is significantly different from 0 (in parentheses) and the significance level for which the null-hypothesis that the coefficient is equal to 0 can be rejected, with the threshold values being 0.1, 0.05, and 0.01, respectively in the form of a star. The regressions are always run with CSR as the exogenous variable. The first two columns show regressions without control variables and the third and the fourth column show regressions for CSR run with the control variables, as motivated above. For period 1, we find that the coefficients from the regressions run without control variables are 0.0274 for raw return, and -0.0153 for abnormal return. Thus, a 1 – point increase in CSR would be related to a 2.74% increase in raw return during this period, and a 1.53% decrease in abnormal returns. However, none of these coefficients are found to be significantly different from 0, thus making it impossible to confirm that the coefficient values are reliable.

Table 2
Results from Period 1
"Top-Bottom" period, 02/20-2020 – 03/23- 2020

This table (2) shows the results from the regressions run from period 1. The period covers February 20th, 2020, until March 23rd, 2020. The regressions are run on our sample consisting of 460 firms, having excluded financial firms as well as firms in low CSR industries such as the weapon industry. Micro-cap firms (market cap < $250 million) have also been excluded as to avoid liquidity problems. CSR Score is the exogenous variable in the regressions, which is an index externally determined by Refinitiv Eikon, ranging from 0 to 1, 0 being the lowest attainable score and 1 being the highest. The two endogenous variables of the regressions are Raw return, and abnormal return. The Raw Return is the gross return over the period, and the Abnormal Return is the abnormal returns calculated using the market model over a five years' estimation period. In the table, the first two columns show regression results for raw return and abnormal return when regressing without control variables. The last two columns show results with control variables. The significance level is given, with the following threshold values: (0.1, ** = 0.05, *** = 0.01). Control variables include Board Size, Cash on Hand, which just like Short Term Debt and Long Term Debt are computed as a ratio with total assets in the denominator, Size is the logarithmic market capitalization, and lastly, there is Profitability, which is the gross profit margin of a company.*

	Raw return (1)		Abnormal return (1)		Raw return (2)		Abnormal return (2)	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
CSR score	0.0274	0.348	-0.0153	0.628	-0.0782 **	**0.018**	-0.0527	0.130
Board size					0.0007	0.879	-0.0100 **	**0.032**
Cash on hand					0.1756 **	**0.045**	0.5492 ***	**<0.001**
Short term debt					-0.1332	0.630	-0.3216	0.271
Long term debt					-0.0380	0.310	-0.0366	0.353
Size					0.0342 ***	**<0.001**	0.0259 ***	**<0.001**
Profitability					-0.0003	0.638	-0.0004	0.577

** p<0.1 ** p<0.05 *** p<0.01*

Turning to the control variables, we see that the coefficient for raw return is seen to be significantly correlated with CSR score. However, the coefficient is negative, meaning that an increase in the CSR score would mean a decrease in raw return for the period, going against our hypothesis that CSR would have a positive impact. Overall, however, due to three out of four of the estimates seeing no significant effect, the evidence points towards that during *period 1* firms are seen to homogenously decline, with no significant impact from CSR. The slight effect identified with negative impact could be explained by investors believing that investments in CSR are unnecessary when the company could be using the money to do other things, similar to what Mr. Friedman postulates (Friedman, 1970).

Our next period is the recovery period, which is when the market recovered from its lowest point on March 23rd. The recovery period is defined by us as ranging until June 5th. The regressions are run the same as was described above for period 1, but with the data representing this period. The table shows negative coefficients for both raw return and for abnormal return. The first row, for example, shows that when run without control variables, the coefficient for raw return is -0.0778 and for abnormal return is -0.0434. Thus, a 1 – point increase in CSR score would be associated with a 7.78% decline in raw return and a 4.34% decline in abnormal return. However, these coefficients cannot be significantly confirmed to be different from 0. When running with control variables the coefficients cannot be identified to be significantly different from 0, either, but the coefficients are positive, contrary to the case with raw return.

Table 3
Results from period 2
"Recovery period", 03/23-2020 – 06/05-2020

This table (3) shows the results from the regressions run from period 2. The period covers March 23rd, 2020, until June 5th, 2020. The regressions are run on our sample consisting of 460 firms, having excluded financial firms as well as firms in low CSR industries such as the weapon industry. Micro-cap firms (market cap < $250 million) have also been excluded as to avoid liquidity problems. CSR Score is the exogenous variable in the regressions, which is an index externally determined by Refinitiv Eikon, ranging from 0 to 1, 0 being the lowest attainable score and 1 being the highest. The two endogenous variables of the regressions are Raw return, and abnormal return. The Raw Return is the gross return over the period, and the Abnormal Return is the abnormal returns calculated using the market model over a five years' estimation period. In the table, the first two columns show regression results for raw return and abnormal return when regressing without control variables. The last two columns show results with control variables. The significance level is given, with the following threshold values: (0.1, ** = 0.05, *** = 0.01). Control variables include Board Size, Cash on Hand, which just like Short Term Debt and Long Term Debt are computed as a ratio with total assets in the denominator, Size is the logarithmic market capitalization, and lastly, there is Profitability, which is the gross profit margin of a company.*

	Raw return (1)		**Abnormal return (1)**		**Raw return (2)**		**Abnormal return (2)**	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
CSR score	-0.0778	0.400	-0.0434	0.617	0.1070	0.336	0.0792	0.447
Board size					-0.0130	0.386	-0.0043	0.760
Cash on hand					-0.0570	0.847	-0.3889	0.160
Short term debt					-1.3227	0.157	-1.1796	0.177
Long term debt					0.2699 **	**0.033**	0.2669 **	**0.024**
Size					-0.0533 ***	**0.007**	-0.0445 **	**0.016**
Profitability					-0.0019	0.369	-0.0018	0.355

** p<0.1 ** p<0.05 *** p<0.01*

The last period in our analysis is *Period 3*, which is the period covering the "Top-Bottom" period, as well as the initial rebound period. Again, the regressions are run in an identical way as earlier, with *CSR score* as the exogenous variable and *raw return* and *abnormal return* as the endogenous variables. When running the regression without control variables we find that the coefficient for raw return is 0.0741, and the coefficient for abnormal return is 0.0543. To put this into perspective, a 1 – point increase in CSR would correspond to a 7.41% increase in raw return during the period. Now, since it is not very likely that a firm can increase its CSR score with 1 point, a return this large is not feasible to achieve. Even though the CSR score variable is not normally distributed, as is evident from figure 2, let us imagine it is for a moment. Improving the score with one standard deviation is not farfetched. The standard deviation of the variable was 28.397. Thus, improving one sigma would correspond to a $0.284 * 0.0741 =$

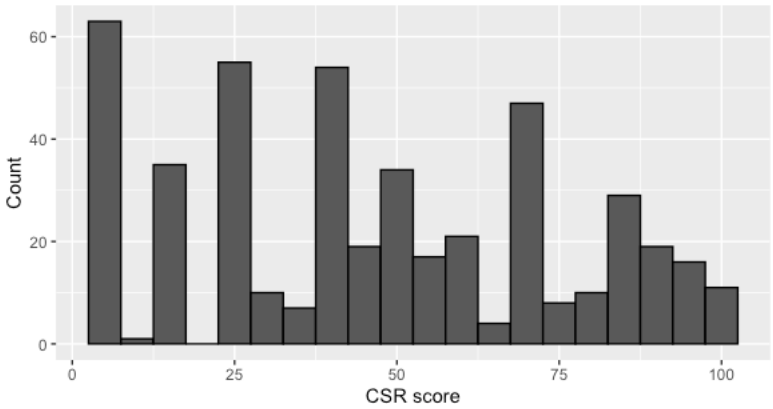
0.021 increase in firm returns during this period. With an average market capitalization of $31.06 billion (only logarithmic market cap is shown in summary statistics), this would correspond to keeping a value of $653 in the company, which means it is definitely enough for a company to care about it. The coefficients for the raw- and abnormal return are significant with 5% and 10 % significance level, respectively.

Looking at the control variables, we do not see the same positive results as without control variables. The control variables seem to scale away the effects we see in the first two columns. Only the raw return has a significant estimate when running the

Figure 2
Histogram of CSR score

This figure shows a histogram and an Anderson – Darling test of the main variable in our analysis, CSR score. It is an index variable ranging from 0 to 1, with 0 being the lowest and 1 being the highest. In Panel A, the index is multiplied with 100 to show an index between 0 and 100. Panel A shows the histogram of the variable, and it seems clear that the variable is not normally distributed. To confirm this, we ran an Anderson – Darling test shown in Panel B. As the P-value is close to 0, we accept the null hypothesis that the sample is not normally distributed.

Figure 3. Panel A. Histogram of CSR score



Panel B. Anderson – Darling

```
data:  CSR score
A = 6.7054, p-value < 2.2e-16
```

Table 4
Results from period 3
"Fall and rebound", 02/20-2020 – 04/10-2020

This table (4) shows the results from the regressions run from period 3. The period covers February 20th, 2020, until April 10th, 2020. The regressions are run on our sample consisting of 460 firms, having excluded financial firms as well as firms in low CSR industries such as the weapon industry. Micro-cap firms (market cap < $250 million) have also been excluded as to avoid liquidity problems. CSR Score is the exogenous variable in the regressions, which is an index externally determined by Refinitiv Eikon, ranging from 0 to 1, 0 being the lowest

attainable score and 1 being the highest. The two endogenous variables of the regressions are Raw return, and abnormal return. The Raw Return is the gross return over the period, and the Abnormal Return is the abnormal returns calculated using the market model over a five years' estimation period. In the table, the first two columns show regression results for raw return and abnormal return when regressing without control variables. The last two columns show results with control variables. The significance level is given, with the following threshold values: (0.1, ** = 0.05, *** = 0.01). Control variables include Board Size, Cash on Hand, which just like Short Term Debt and Long Term Debt are computed as a ratio with total assets in the denominator, Size is the logarithmic market capitalization, and lastly, there is Profitability, which is the gross profit margin of a company.*

	Raw return (1)		**Abnormal return (1)**		**Raw return (2)**		**Abnormal return (2)**	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
CSR score	0.0741 **	**0.026**	0.0543 *	0.081	-0.0713 *	0.054	-0.0545	0.107
Board size					0.0021	0.673	-0.0029	0.526
Cash on hand					0.1112	0.258	0.3009 ***	**0.001**
Short term debt					-0.1210	0.697	-0.2019	0.477
Long term debt					-0.0529	0.208	-0.0509	0.185
Size					0.0496 ***	**<0.001**	0.0442 ***	**<0.001**
Profitability					-0.0001	0.925	-0.0001	0.865
						** p<0.1*	*** p<0.05*	**** p<0.01*

regression with control variables, and it is negative, just like what we saw during the "top-bottom" period. Thus, not much can be said with certainty regarding this period. The results are interesting, however, so we have decided to run an additional set of regressions for the initial rebound period from March 23rd to April 10th – the period included in period 3 but not in period 1.

The results from this set of regressions are collected in table 5. As is evident from the results, the rebound period saw a very significant impact of CSR on firm performance. The abnormal return coefficient suggests an 11.9% increase in firm return when increasing CSR with 1 point, which is larger than when looking at all of the main periods, while having a very low P-value. The result for raw return stays significant when controlling for the control variables, but not for abnormal return. Either way, the coefficient estimates are positive for all the regressions. The results indicate a positive impact of CSR during this period.

Table 5
Results from the initial rebound period

This table (5) shows the results from the regressions run from the resulting period of initial rebound not included in our original analysis, where we suggest CSR should have a positive impact. This period ranges from March 23rd, 2020, until April 10th, 2020. The period thus incorporates the "initial rebound" period, where the market had a rapid increase. The regressions are run on our sample consisting of 460 firms, having excluded financial firms as well as firms in low CSR industries such as the weapon industry. Micro-cap firms (market cap < $250 million) have also been excluded as to avoid liquidity problems. CSR Score is the exogenous variable in the regressions, which is an index externally determined by Refinitiv Eikon, ranging from 0 to 1, 0 being the lowest attainable score and 1 being the highest. The two endogenous variables of the regressions are Raw return, and abnormal return. The Raw Return is the gross return over the period, and the Abnormal Return is the abnormal returns calculated using the market model over a five years' estimation period. In the table, the first two columns show regression results for raw return and abnormal return when regressing without control variables. The last two columns show results with control variables. The significance level is given, with the following threshold values: (0.1, ** = 0.05, *** = 0.01). Control variables include Board Size, Cash on Hand, which just like Short Term Debt and Long Term Debt are computed as a ratio with total assets in the denominator, Size is the logarithmic market capitalization, representing size, an lastly, there is Profitability, which is the gross profit margin of a company.*

	Raw return (1)		**Abnormal return (1)**		**Raw return (2)**		**Abnormal return (2)**	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
CSR score	0.0911 ***	**0.004**	0.1194 ***	**0.001**	0.0768 **	**0.041**	0.0539	0.193
Board size					0.0001	0.979	0.0073	0.189
Cash on hand					-0.2058 **	**0.039**	-0.4795 ***	**<0.001**
Short term debt					0.3761	0.232	0.4942	0.155
Long term debt					0.0142	0.738	0.0118	0.802
Size					0.0090	0.177	0.0161 **	**0.028**
Profitability					0.0004	0.540	0.0005	0.531

** p<0.1 ** p<0.05 *** p<0.01*

The statistical significance of the rebound period could be explained with the founding arguments of CSR, which argues that high scoring CSR firms will have an advantage in a volatile market facing high uncertainty of regulatory intervention. This can be in the form of being prepared to face harder regulation, but also in the context of having an easier time of getting governmental approval for aid, such as grants or loans. The United States Government's Coronavirus Aid, Relief, and Economic Security Act (CARES) was passed by the senate on March 25th (CNBC, 2020), and was signed into law two days later by President Donald Trump on March 27th (New York Times, 2020). According to the United States Government (Data Lab US Government, 2020), the CARES act was "the largest supplemental appropriation in American history", with an agency funding of $2.08 trillion. There had been other, smaller financial aid packages

before this, but the CARES act outsized the earlier packages by a lot. We believe the sudden turn in the market is highly correlated to the financial aid packages from the government. Bank of America (Fortune, 2020), estimated a much larger decline if the CARES act was not passed than if it was approved. Since this surge of capital stimulated the market, it is also important to think about how this is perceived. Microeconomic theory tells us that governments will be more willing to support firms with positive externalities. Since positive externalities and CSR go hand in hand, we argue that the ambiguity of the exact constitution of the CARES act in relation to the launch contributes to the positive impact of CSR during period 3. Google Trends shows that both the number of searches on the internet and the number of articles written about the CARES act surged during the period between March 23rd until April 5th and was on a high level at least until April 10th (See appendix). Concludingly having a firm with a high CSR score gives an initial advantage, which in this case is in the form of recovery, when uncertainty of governmental intervention is high. However, a general rule for this phenomenon cannot be determined without further research, since this might be an outlier due to external confounding events.

To summarize, we found little evidence for an impact in the "Top-bottom" period occurring between February 20th and March 23rd. The only suggestive evidence was that there was a negative impact of CSR, but the effect was only seen in one of the regressions for both period 1 and period 3. Neither did we find evidence for an impact during the recovery period occurring from March 23rd to June 5th. During the period including the "Top – bottom" period, as well as the initial rebound period occurring from February 20th until April 10th, we do see that there is a positive significant impact from CSR on returns, indicating that CSR had an impact on firm performance during the initial rebound of the market, but not in the longer run. This is only seen when not controlling for other variables, however. Since period 3 includes the "Top-bottom" period, in which there was no impact of CSR, we did a robustness test on a period not originally included in our main analysis, namely, from March 23rd until April 9th, which coincides with the period of surged interest in the CARES act (see appendix), to check whether the results from this period confirm our suspicions that there has been a significantly positive impact from CSR in the initial rebound period.

Comparing our results with previous research it is somewhat in line with Bae et al. (2021), which find no connection between improved financial performance and pre-crisis CSR. In our analysis, two of our windows are the same as the ones that Bae et al. (2021) cover in their analysis. Specifically, they cover our period 1 and period 2 in their crisis and post-crisis windows, respectively. Here, our results are homogenous, in that we find no connection between improved financial performance and pre-crisis CSR except for the suggestive negative impact of CSR during the fall. We, however, went deeper into to the crash period and found that there is a positive effect mainly in the short term rebound period after the crash. We argue that this is due to the massive CARES act that the United States government issued in late March. There was a lot of uncertainty regarding who would benefit from this package during this period but microeconomic theory tells us the government is more likely to give more aid to firms creating positive externalities for society. We therefore argue that the reason we see the positive impact of CSR on firm performance is due to the uncertainty of state

intervention. More research on this topic is needed to say whether this is a general result.

Furthermore, our results do not directly contradict those of Lins et al. (2017). Lins et al. (2017) find that trust CSR is linked to trust and social capital, so even though our results say that CSR does not impact crisis firm performance other than during a specific short period, the results are still consistent since COVID-19 was not a trust crisis. If anything, it might have been a "trust boom", according to the Edelman Trust Barometer (Edelman Trust Barometer, 2021). When comparing our results to Schnietz and Epstein (2005), which say that corporate reputation works as a dampener during market decline, our results are contradictory. However, Schnietz and Epstein (2005) tested the impact of corporate reputation/CSR in a similar environment as Lins et al. (2017). Specifically, they tested the results during the 1999 Seattle WTO meeting failure, which was a period of distrust, and not a crisis caused by physical limitations on economic activities such as the COVID-19 crisis. All, in all, our results do not contradict these studies and in regards to Bae et al. (2021), it provides a deeper understanding of the impact of CSR during the COVID-19 crisis.

Industry analysis

Having established that CSR does not impact firms during period 1 and period 2, but does significantly impact part of period 3, and is very impactful during the initial rebound period, we now turn our heads to an industry analysis. As mentioned earlier, our data sample consists of 460 firms from the Refinitiv Eikon database. In our sample we find 98 unique industries, which means that each industry consists of no more than 4.69 (460/98) on average. Analyzing an industry with only a few observations would expose the analysis to major representation problems, so we extract the industries with a more representable number of observations. We have set our threshold to 10 firms and end up with a sample of 9 industries with observations ranging from 11 to 24. Industries represented in our analysis are *commercial real estate investment trusts (REITs), electric utilities, industrial machinery and equipment, it services and consulting, medical equipment, supplies and distribution, oil and gas exploration and production, pharmaceuticals, software,* and *specialized REITs.*

Regressions are run for each industry, albeit without control variables. The mean returns and average CSR scores are also represented in the table (6). Likely not unrelated to the not so numerous observations in each group, few cells show results with coefficients that are significant. For raw return of period 1, only two industries are shown to be significantly affected by CSR, namely IT services and consulting and pharmaceuticals. Both show a small, significant coefficient, with IT services and consulting having a coefficient corresponding to a 1.9% increase with a 100 – point increase in CSR score and pharmaceuticals showing a 1.7% increase by the same CSR score increase. The only other coefficients we see being significantly different from 0 are both for pharmaceuticals, occurring in period 2 (recovery) for raw and abnormal return. Interestingly, in this case, the coefficients are negative, and it is thus shown that for pharmaceuticals an increase in CSR score would mean a decline in firm performance,

contrary to our hypothesis of a positive impact. On the other hand, the argument could be made that pharmaceutical companies central role in vaccine development during this period might have grater positive externalities than investing in CSR, thus making pure CSR investments with comparably lower levels of positive externalities an inefficient use of resources. Therefore, developing a vaccine and consequently helping save people from getting COVID-19 might be the best way to improve their corporate reputation and/or CSR. This could be an indication that the importance of CSR could have a situational aspect determining whether it impacts firm performance positively or negatively. If it is expected from an industry that they do something specific that would contribute to the world, maybe doing something else, albeit a good thing, could hurt the perceived CSR and thus firm performance. This would at least be a plausible explanation for the statistically significant coefficients of pharmaceutical companies during the recovery period.

We believe statistical regressions to be an important tool in analysis, but as there are so few observations in each group, we believe it fit to also simply compare the mean of the specific industry to the mean in the general population. This will allow us to expand on the otherwise limited regression analysis on the smaller industry samples. Commercial REITs, for example have a CSR mean of 46, which is on par with the population mean of 46. When looking at the return, both raw and abnormal, it is evident that the return is lower than the population every for every period. We can thus infer that this industry was hit relatively hard by the crisis compared to the rest of the firms in the sample. In the table (6), a very, the industry means that are higher than the population mean are written in bold text. Marking the means this way makes an interesting pattern stand out.

Table 6
Industry divided analysis

This table (6) shows an analysis broken down into industries in the sample. Our sample consists of 460 firms from the Refinitiv Eikon ESG database. Micro-cap firms (market cap < $250 million) have been excluded from the sample, as well as financial firms and firms with a traditionally low CSR score such as firms in the weapon industry. Our main variable of interest is CSR, which in our data is represented by CSR score, an index ranging from 0 to 1 with 0 being the lowest attainable score and 1 being the highest. The regressions are run with this score as the exogenous variable and returns for different periods as the endogenous variable. For each of these periods we have collected raw return, as well as the abnormal return, which is the abnormal return for the period calculated using the market model with a five years' estimation period.

In the table, regressions are run with CSR as the independent variable and raw- and abnormal returns as the dependent variable. The resulting coefficient from the regressions are represented on the first row of each cell, and the P-value that this is significantly different from 0 is represented in parentheses underneath. If significant, an asterisk is displayed next to the p-value with the significance levels as follows: (= 0.1, ** = 0.05, and *** = 0.01). Next, the mean for the dependent variable of each respective industry is represented, as well as the mean for the independent variable. In*

Table 6	***Commercial REITs*** *N = 16*	***Electric Utilities*** *N = 24*	***Industrial Machinery & Equipment*** *N = 19*	***IT Services & Consulting*** *N =14*	***Medical Equipment, Supplies & Distribution*** *N = 12*	***Oil & Gas Exploration and Production*** *N = 22*	***Pharmaceuticals*** *N =11*	***Software*** *N= 15*	***Specialized REITs*** *N = 19*
Period 1									
Raw									
Coefficient	-0.0012	-5e-04	-0.0015	0.0019	0.0023	0	0.0017	-0.002	-4e-04
(P-value)	(0.3832)	(0.3329)	(0.2929)	(0.0973)*	(0.1863)	(0.9817)	(0.044)**	(0.5641)	(0.7605)
Mean (-0.44)	-0.4757	**-0.3845**	**-0.4305**	**-0.3848**	**-0.3652**	-0.6281	**-0.2816**	**-0.2797**	-0.5441
CSR (46)	46.5736	67.1909	28.9546	49.7112	30.5554	58.2543	61.1532	35.1146	48.0821
Abnormal									
Coefficient	-0.001	-2e-04	-0.0011	0.0025	0.0014	0	0.0011	-0.0037	8e-04
(P-value)	(0.4362)	(0.7949)	(0.4531)	(0.1018)	(0.3843)	(0.9957)	(0.2925)	(0.4029)	(0.51)
Mean (-0.09)	-0.2661	-0.2248	**-0.0418**	**-0.0342**	**-0.0432**	-0.1391	**0.0326**	**0.1474**	-0.3021
CSR (46)	46.5736	67.1909	28.9546	49.7112	30.5554	58.2543	61.1532	35.1146	48.0821
Period 2									
Raw									
Coefficient	0.0012	0.0016	0.0034	-0.0037	-0.0022	-0.0066	-0.0049	-0.0034	0.0022
P-value	(0.609)	(0.162)	(0.2758)	(0.1842)	(0.3614)	(0.4366)	(5e-04)***	(0.3923)	(0.6213)
Mean (0.68)	0.4771	0.3418	0.5397	0.4718	0.5586	**1.5808**	0.4393	0.5192	**0.8233**
CSR (46)	46.5736	67.1909	28.9546	49.7112	30.5554	58.2543	61.1532	35.1146	48.0821
Abnormal									
Coefficient	0.001	0.0013	0.0029	-0.0042	-0.0014	-0.0067	-0.0044	-0.0019	0.001
P-value	(0.6739)	(0.2293)	(0.2778)	(0.1847)	(0.5815)	(0.4229)	(5e-04)***	(0.6808)	(0.8061)
Mean (0.37)	0.2904	0.1989	0.1939	0.1596	0.2708	**1.1474**	0.1596	0.138	**0.6078**
CSR (46)	46.5736	67.1909	28.9546	49.7112	30.5554	58.2543	61.1532	35.1146	48.0821
Period 3									
Raw									
Coefficient	-0.0018	-6e-04	-1e-04	0.0018	0.0014	-1e-04	8e-04	5e-04	2e-04
P-value	(0.2977)	(0.3212)	(0.9591)	(0.1073)	(0.4977)	(0.9635)	(0.3271)	(0.8206)	(0.9295)
Mean (-0.28)	-0.3261	**-0.1782**	**-0.2876**	**-0.2157**	**-0.1508**	-0.5124	**-0.0724**	**-0.1777**	-0.3774
CSR (46)	46.5736	67.1909	28.9546	49.7112	30.5554	58.2543	61.1532	35.1146	48.0821
Abnormal									
Coefficient	-0.0017	-4e-04	2e-04	0.0021	0.0001	-1e-04	5e-04	-4e-04	5e-04
P-value	(0.295)	(0.38)	(0.9018)	(0.0769)*	(0.6174)	(0.9711)	(0.5313)	(0.881)	(0.7587)
Mean (-0.11)	-0.219	**-0.096**	**-0.0888**	**-0.0365**	**0.0135**	-0.2618	**0.0882**	**0.0406**	-0.2537
CSR (46)	46.5736	67.1909	28.9546	49.7112	30.5554	58.2543	61.1532	35.1146	48.0821

our sample of 460 stocks, there were 98 industries represented. We have excluded any industry that does not have more than 10 firms represented.

With the exception of commercial REITs, which has a lower mean for all periods, no industry has a consistently higher or lower mean than the population mean. In the table, the two periods corresponding to the market crash are period 1 and period 3, and the period corresponding to a recovery period is period 2. The table shows the pattern that if a firm has higher return than the mean during a crisis period (1 or 3), they will automatically have a lower mean during the recovery period, and vice versa. Six industries, electric utilities, industrial machinery and equipment, IT services and consulting, medical equipment, supplies and distribution, pharmaceuticals, and software

all have higher return than the average during the market crash, but have lower return the recovery period. The remaining two industries (again, excluding commercial REITs), both have higher return than the mean during the recovery period but lower during the crisis period.

The result that industries that had a better/worse performance during the crash had the opposite effect in the subsequent period is understandable, since firms that performed better than average in period one are closer to their top potential or has less to "recover" period two, which makes it logical that they will perform worse than average in the second period. The same goes for the opposite situation. Firms that performed worse than average in period one has more to recover in period two, therefore it is logical that they will perform better than average in the second period. On the other hand, that commercial REITs preformed worse in both periods might suggest that this industry can be singled out as especially effected by the crisis. That this can be seen with commercial REITs might be explained by the relatively high fixed cost and sensitivity to deferred payments, in comparison to most other industries.

The industries that have performed the best during each period are pharmaceuticals and software during period 1 and period 3, with an average of 17.25p.p. and 15.58p.p. higher return than the mean, respectively, and oil and gas exploration and production and specialized REITs during period 2, with an average of 83.91p.p. and 19.06p.p. higher return than the mean. Turning our heads to the CSR score of these firms shows us that pharmaceuticals outperforms the mean of 48, with its score of 61, and as well as oil and gas exploration and production with its score of 58, as does specialized REITs, although barely, with its score of 48. Software underperform compared to the mean with its score of 35. Again, because of the few observations, nothing significant can be said about the effect of CSR on individual industry level, and the wide distribution of CSR mean and return mean does not provide a clear insight to how CSR affects return.

Bae et al. (2021) also perform an industry analysis. However, their industry classification differs from ours, and they have a much larger sample than us, so the comparability strength can be questioned. During the first period, we find a significantly positive impact of CSR on the pharmaceuticals level, and Bae et al. (2021) find it for their industry defined as "Healthcare, medical equipment, and drugs", which could be said to be at least overlapping industry definitions. In period 3 we only find a significant impact on the IT services and consulting industry, while Bae et al. (2021) find it for "Chemicals and allied products". We wish to do a more in-depth industry analysis to increase comparability, but our limited sample size also limits are ability to do this. As we have seen in our industry analysis, there is much information to be extracted from such an analysis, and this is something we would improve, should we redo this paper in the future.

7. Conclusion

In our analysis we find that corporate social responsibility (CSR) had no general impact on firm performance during the COVID-19 market crash. However, we find that CSR did have a significant impact during a certain period of the crash, namely, the initial rebound period where there were large financial aids planned by the government. We also find a slight hint towards CSR having a negative impact on firms during the fall of the market, but more research would have to be done to confirm this. Additionally, we find that different industries are affected differently, and that CSR even had a negative impact on certain industries.

When looking at our results with the perspective of previous research in mind it is somewhat in line with Bae et al. (2021), who find that CSR does not impact firm performance during COVID-19. This contradicts trust associated benefits that is presented in Lins et al. (2017). Moreover, our results show that corporate reputation did not work as a dampener during the market crash of 2020, which opposes results by Schnietz et al. (2003). Subsequently the question if CSR represents trust and corporate reputation or if it is something completely different is still unanswered. However, an interesting finding is that CSR ranking had a positive but short-term impact on firm performance, which might instead suggest that the metric can be a measure of the firm's potential gain from state intervention. On the other hand, high scoring CSR firms outperforms the market when uncertainty of state intervention is high, which would explain that the advantage of having a high CSR score is protection from uncertainty, thus resulting in the initial recovery boost. Therefore, reasoning that corporate reputation has an initial boosting effect for recovery instead of a dampening effect during a crash, might just be explained by timing and clarity of state intervention.

In conclusion, our results confirm the view of Bae et al. (2021), in that there is no general impact of CSR during a market crash, but we also find significant impact when there is ambiguity in state intervention, due to our use of several event windows. The scope of our thesis is limited to the impact of CSR during the COVID-19 market crash, but future studies could use our results as an interesting starting point and look at the impact of CSR during other times of state intervention, not necessarily during times of a market crash.

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Appendix

This graph shows a graph of the amount of searches on “CARES act” during the first part of 2020. A surge of interest can be seen in the end of March. The reader can verify the graph by going to Google Trends and entering the search term “CARES act”. Here is a link from our result: https://trends.google.com/trends/explore?date=2020-02-01%202020-07-20&geo=US&q=%2Fg%2F11jf9nn3yz
The same pattern can also be seen when looking at number of news articles written on the topic.