Master Thesis Financial Economics

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The influence of Socially Responsible Investments on company performance in the U.S.

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Abstract

This paper examines the value of trustworthy companies by regressing their stock return on their Corporate Social Responsibility (CSR) score during two trust crises. The two crises that are studied entail the financial crisis in 2008 and the more recent trust crisis in 2018. To measure the possible mitigating effects of diminishing trust, multiple statistical models are used. The drawn conclusion constitutes a distinction between a sole trust crisis and a trust crisis accompanied with an economic downturn. During the latter crisis, companies with a high CSR score receive a more positive valuation by shareholders and perform better financially. This effect is however unconfirmed when an economic decline is absent.

Nu zijn wij, wij zijn nu

Echte Rotterdammers (m/v/x)
– Ken je kijken, met je muil –
Schoon genoeg van hokjes
Ik maak er geen woord aan vuil
Roepen niet, noch wijzen ze
Letten op de buurt, zorgen voor elkaar
Ze bouwen mee aan een stad
Waar er plek is voor alle soorten raar
Waar achtergrond geen achterstand is
Waar wij gelijke kansen hebben
Waar zij met minder nog welkom zijn
Waar oud én jong het voor het zeggen
Geen strijd om ego's, de waarheid te vriend
Zó raken we de kloof kwijt
Ik stem op ruimte voor van alles wat
Zo'n stad verdient de hoofdprijs

– Derek Otte
Stadsdichter van Rotterdam 2017–2018

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1 Introduction

Present-day, the United States know more than a decade of erratic years. After the start of the financial crisis in 2008, questions were raised on the decreasing trust in companies, especially on the financial markets (Elliott, 2011). This reduction in trust was not a shock, seen the mistakes that were made causing this financial crisis (Taylor, 2009). In its yearly Trust Barometer, Edelman Intelligence has examined the level of trust by society on different institutions, showing a volatile trend, with a clear decline in 2009, as well as one more recently in 2018 (Edelman Intelligence, 2001-2019).

The first collapse was a reason for Lins, Servaes & Tamayo (2017) to investigate whether trust was of influence on firm performance, by connecting it to social capital. Companies who are invested in society and caring about sustainability, development and their employees, could generate more trust within their stakeholders, presumably leading to a better firm performance. Lins et al., (2017) researched this with a focus on Corporate Social Responsibility (CSR), as a definition of social capital, to link this to several firm performance factors during the economic crisis. This resulted in a significant higher performance of firms who scored high on CSR, opposite to the firms who scored low. Therefore, they have successfully accepted the hypothesis that social capital (measured as CSR) generates trust and leads to a higher firm performance during times of (financial) distress in the markets. Nevertheless, this link seems to only be proven during the severe financial crisis and to a lesser extent the Enron/Worldcom scandal. It is interesting to analyze if these results hold up during the clear dip in trust as examined by Edelman Intelligence (2018).

This paper investigates if the results from the Lins et al., (2017) paper are reliable by replicating their research, while extending it with a Principal Component Analysis and studying the used industries separately. Next, the external validity of their paper is tested, by extrapolating the time frame, taking the aforementioned 2018 trust fall into account. This leads to a broader study of the outcome of Lins et al., (2017). Their conclusion states that during a negative shock of trust in firms and markets, firms will suffer less consequences of this when they have built trust with their stakeholders through investments in social capital. This current research therefore contributes to the research of the firm specific economical value of trust, measured by socially responsible investments. Next to this, it contributes to the literature that focus on CSR as value-enhancer for shareholders. The following research question is answered:

Research question: What effect on their valuation, financial health and performance can trustworthy firms in the U.S. expect during periods of decline in trust using the CSR based method by Lins et al., (2017) as a starting point?

This study answers the research question using a theoretical and quantitative analysis. The section Theoretical Framework analyzes the current literature regarding trust, social capital and firm performance. Next, the section Methodology explains the research design. The research is divided

in three parts, where the first part replicates the Lins et al., (2017) paper by researching the 2008 trust crisis. This is studied by use of a linear regression model looking at the influence of CSR score on raw and abnormal returns, extended with an examination of separate industries, CSR quartiles and individual categories. Furthermore, a Principal Component Analysis is used to attribute more explanatory value to the different categories.

Part II of the paper examines the external validity of the Lins et al., (2017) research, by taking the more recent trust crisis of 2018 into account. This is also conducted by a linear regression model, where the same CSR score, as well as a positive CSR dummy is used to examine its effect on returns. Both Part I and II of the paper are included with a U.S.-based dummy, to examine if domicile is of influence on firm performance during low-trust periods.

Furthermore, Part III uses a difference-in-differences model with continuous treatment to compare both periods together and individually, examining the influence of the CSR score during and after each crisis. Next to this, different financial factors affecting company performance and capital raising are incorporated as dependent variable, to study possible drivers of excess returns.

In the section Data, the sample selection process for all three parts is described, together with a disclosure of the used data sources and a demonstration of the descriptive statistics. Moreover, the section Results presents the outcome of the used research models and links them to the relevant hypotheses. These hypotheses combined answer the research question in the Conclusion.

The conclusion that is drawn from this research separates two trust declining periods for companies: those that are associated with an economic decline and without an economic decline. In the first period, companies who invest in Corporate Social Responsibility are considered more trustworthy by shareholders, which contributes to a more positive valuation, a better financial health and performance. This effect is however not confirmed when a period of economic decline is absent. Nevertheless, it seems profitable for a company to keep the U.S. as domicile, because of the positive effects during low trust periods, compared to non-U.S. based companies.

Limitations of this research are found in the insufficient availability of CSR data and differences in calculating certain variables, in comparison with Lins et al., (2017).

Recommendations for further research consist of extending the time frame of the Difference-in-differences model, to more profoundly examine Post-crisis$_2$ effects. Furthermore, the connection between a trust decline and its financial effect on firms needs to be researched further, to substantiate the link between high-CSR companies and the diminished effect of a trust decline.

2 Theoretical Framework

2.1 How is trust determined?

When addressing the definition of trust, various authors agree on a couple of common components, referring to the World Values Survey (WVS) questions on trust.[1] Trust can be defined as the belief that one person has towards another person, who will perform only advantageous behavior towards him or her, regardless the presence of this first person (Gambetta, 2000). This might lead to cooperation between these two parties, where an expectation towards each other is substantial (James, 2002). Furthermore, the concept of reciprocity is influential within this definition. Reciprocity is defined by the expectation that another party will return a given favor, without a formal obligation to do so, thereby anticipating on the cooperation mentioned before (Berg, Dickhaut, & McCabe, 1995; Servaes & Tamayo, 2017).

Looking at the effects of trust on (financial) markets, the period 2008-2009 is an eminent example. As mentioned before, the 2009 Edelman Trust Barometer describes a severe decline in trust, caused by the financial crisis (Edelman Intelligence, 2009). Especially during times of decreasing faith in the market, trust is necessary to preserve cooperation. To study the effect of trust on market performance, social capital will be used.

2.2 How is social capital determined?

Social capital can be defined as the immaterial value given to the social relationships within society, between individuals or between companies and their stakeholders. Social capital is originally defined and measured at the societal (macro) level, and onward applied to the behavior of individual members of this society (Guiso, Sapienza & Zingales, 2004). Next to this, Glaeser, Laibson & Sacerdote, (2002) formulated the perspective of social capital as an element of an individual's human capital, which therefore could also be defined at an individual (micro) level.

Within society, civic engagement can be used to quantify social capital (Putnam, 2000; Putnam, Leonardi & Nanetti, 1993). This is also affirmed by the OECD, which splits social capital in four different parts: (1) personal relationships, (2) social network support, (3) civic engagement, (4) trust and cooperative norms. Civic engagement hereby could be defined as positive acts by civilians, which contributes to the society they are living in, their community and social life (Scrivens & Smith, 2013). This complements the earlier mentioned reciprocity, as well as cooperation between members of that society (Servaes & Tamayo, 2017).

Moreover, social capital could be defined at firm level, which focuses on the aspect of social connections within a firm, acquired through shared trust (Leana & Van Buren, 1999). This trust

[1] See Sapienza, Toldra-Simats, & Zingales, (2013), Sapienza & Zingales, (2012) and Guiso, Sapienza, & Zingales, (2009).

applies especially to the stakeholders of the firm, in particular the shareholders, employees and customers of the firm (Servaes & Tamayo, 2017). Social capital contributes to trust and cooperation of shareholders (Putnam et al., 1993) and "consists broadly of the quality of the relationships that the firm has built with a variety of these stakeholders" (Servaes & Tamayo, 2017). Despite the distinction between societal and corporate social capital, these factors are nevertheless considered as interdependent.

With these definitions, social capital could be used as enabler of collective action or cooperation, therefore leading directly to positive results. Economic effects of this are for example transaction costs reduction (Knack & Keefer, 1997) and potentially more efficient allocation of resources (Lins et al., 2017). Because of the trust and compliance to civic norms, which social capital embodies, it could be considered as an essential component of economic development (Fukuyama, 1995). Firms are interested in the process of gaining social capital and the result on film value and performance. Nevertheless, the law of diminishing marginal returns also affects social capital. This implies that there is a limit to the amount of effective social capital that could be invested in (Servaes & Tamayo, 2017).

2.3 How is social capital measured?

When assessing social capital, one might think that a change in share price is a perfect measure. However, taking the semi-strong version of the Efficient Market Hypothesis - where all public available information is incorporated in the share price - into account, the stock price of a company should already contain all value of social capital (Lins et al., 2017; Servaes & Tamayo, 2017). Nevertheless, when seeing corporate social capital as the effort a company is making to stimulate the well-being of all stakeholders of the firm, investments in Corporate Social Responsibility (CSR) could be considered as a reasonable quantification. CSR has become more essential in building trust and establishing the well-being of stakeholders of a firm (Fitzgerald, 2003). Likewise, it involves aspects of civic engagement, trust and cooperative norms (Lins et al., 2017). This will lead to cooperation between a firm and its stakeholders in its broadest sense, contributing to sustainable economic growth (World Business Council for Sustainable Development, 2000).

Aoki (2011) measures social capital by the amount of social contribution (referring to investments in CSR) as well as social recognition by citizens. This shows that investment in CSR alone is not enough. Next to this, Servaes & Tamayo (2017) argue that the influence of the reputation of a company on socially responsible investments is substantial. In their preceding paper (2013), they emphasize the importance of sincerity in a firm's CSR investments and a genuine reputation as a prerequisite for pay-off in terms of firm value. Linked to this is the influence of consumer's awareness of these investments. Furthermore, these authors provide other measurements of social capital in their 2017 paper. For example, the amplitude of the central position of a company in relation to

their customers and suppliers should explain the consistency of their network which could work as a proxy for social capital (Ahern, 2013).

Concluding aforementioned papers, there is not one way to come up with a perfect measure of social capital. In their paper, Lins et al., (2017) follow a recent book by Sacconi and Degli Antoni (2011) which confirms the link between social capital, trust and CSR investments. This can be connected directly to the cooperation between a firm and its stakeholders, together with stakeholders' trust, while taking exogenous variation into account. Other positive externalities are the decrease of short-term opportunistic behavior by operational managers (Bénabou & Tirole, 2010) and engagement in criminal activities such as insider trading (Gao, Lisic & Zhang, 2014) and earnings management (Kim, Park & Wier, 2012).

2.4 How is firm performance determined?

Lins et al., (2017) summarize a lot of researches who have investigated the influence of social capital on trust in societies. They notice a niche and accordingly appraise the influence of CSR on a firm by considering firm performance. Herewith, they emphasize the importance of determinants of firm performance beyond financial elements. Therefore, the financial crisis is a period which is eminently suitable for this comparison on a micro-economical level. Next to the study of the outperformance of the firms during this period, the profitability, together with the productivity and ability to raise debt will be examined. The indicated study results in, inter alia, higher profitability, gross margins, sales growth and sales per employee for the high-CSR firms (Lins et al., 2017). This follows the earlier explained concept of reciprocity of stakeholders, specifically investors, because these parties would be more likely to support firms with high social capital in periods of distress.

Another explanation for the better firm performance could be a valuation premium caused by higher trust, as clarified by Guiso, Sapienza & Zingales, (2008). When shareholders consider an investment opportunity, they do not only look at the risk-return trade-off, but also focus on the faith that the data leading to this trade-off are reliable and the system is fair. During a time where trust is declining, for example amid a financial crisis, they may fear that their decisions are made on false, non-credible assumptions (Guiso et al., 2008). The trustworthiness of firms that invest in social capital might be leading to a valuation premium placed by these investors. Other stakeholders such as employees and suppliers may keep their confidence in these companies because they are also more likely to keep their word and hold trust in the absence of formal contracts. Therefore, these stakeholders are more likely to return the favor and cooperate (as an act of reciprocity) in times of distress. This is researched by focusing on stakeholders separately, looking at employees (Edmans, 2011; Guiso, Sapienza & Zingales, 2015) and customers (Servaes & Tamayo, 2013).

Aforementioned could be linked to another research using the General Social Survey (GSS), stating that companies with a higher trust level are less prone to agency problems, have a higher

profitability and higher valuation (Hilary & Huang, 2015). The expenses on CSR activities outweigh the costs on CSR in times of low trust, which therefore can be moderately used as an insurance policy during these times, beside the function of protection against firm-specific legal risk (Godfrey, Merrill & Hansen, 2009).

3 Methodology

In this section the research design of this paper will be further specified. As mentioned before, the research will be divided in three parts, researching the falls in trust in respectively 2008/2009 and 2017/2018 separately and together. The models that will be used to conduct the research and test the hypotheses are various linear regression models, a principal component analysis and a difference-in-differences model. This last model will use an interaction variable to compare the different crisis and post-crisis periods, as well as to examine different drivers behind the excess returns.

3.1 Part I and II

3.1.1 Linear regression model

Firstly, the role of CSR on firm performance will be approached with a series of linear regression models. These models will use Ordinary Least Squares (OLS) to examine the influence of CSR on raw as well as abnormal returns, next to the earlier specified control variables. The baseline regression model uses CSR as independent variable to explain raw returns and abnormal returns separately. The predicted effect is a positive CSR score leading to a higher valuation by shareholders. This positive effect can be derived from the trust shareholders ascribe to companies with high CSR investments. Next, financial control variables are incorporated as explanatory variables in a multivariate regression, to decompose the influence of the CSR variable and discard any omitted variable bias. The same effect is anticipated on CSR and returns, with the financial variables to substantiate the positive valuation effect. A high financial health and score on other financial characteristics, contribute to a positive valuation and can therefore be used as control variables. This can be formulated as follows:

$$R_t = \alpha + \beta_1 NetCSR_i + \epsilon_{i,t} \quad \text{with} \quad \epsilon \sim N(0, \sigma^2) \tag{1}$$

$$\begin{aligned} R_t = \alpha &+ \beta_1 NetCSR_i + \beta_2 Ln(MktCap)_i + \beta_3 L/Tdebt_i \\ &+ \beta_4 S/Tdebt_i + \beta_5 CashHold._i + \beta_6 Profit._i + \beta_7 B/M_i \\ &+ \beta_8 Neg.B/M_i + \beta_9 Mom._i + \epsilon_{i,t} \quad \text{with} \quad \epsilon \sim N(0, \sigma^2) \end{aligned} \tag{2}$$

Where the residuals (ε) are assumed to have an independent, identical and normal distribution, a mean of zero and a constant variance (there is homoscedasticity).

Because of the input of buy-and-hold raw and abnormal returns calculated over the whole crisis period, one observation per firm is included in the data set. This means that firm, nor time fixed effects need to be taken into account. Nevertheless, different industries can bias the outcome of the models, therefore industry dummies will be used to correct for this fixed effect. In the second part of

the first model, the industry dummies will be divided per SIC code category, to examine its specific influence. The classification of each SIC code per category can be found in Appendix A.2. Contrary to the model used by Lins et al., (2017), the firm's four-factor loadings, based on the Fama & French three-factor model together with the Momentum factor, will be excluded from this analysis. After this linear regression model, the CSR variable will be splitted into quartiles, to examine the existence of a difference between a relatively high and low CSR score on the returns and the control variables. To further explore the different elements within CSR, next the net variable will be separated per category again to examine their individual influence. After this, a Principal Component Analysis will be used to filter noisy data and construct components who represent a more proportionate part of the information (Brooks, 2014).

3.1.2 Principal component analysis

The mathematical factor model 'Principal component analysis (PCA)' has been created by Pearson (1901) and was first extended by Hotelling (1933). With the PCA, the position of the different CSR categories relatively to each other are analyzed. This is done by combining correlated variables and reconstructing less uncorrelated variables: 'principal components'. These components still adequately represent a sufficient part of the data, yet will reduce the total amount of variables. The first principal component describes the largest part of the variation in the data, with respectively the consecutive components a smaller part of this variation. The principal components that will be explained by the PCA, are called 'eigenvectors', the variance explained by these principal components are called 'eigenvalues'. This can also be shown in the following formula from Hull (2015):

$$Ax = \lambda x \tag{3}$$

Where A denotes a square matrix (nxn), x denotes a column vector (1xn, the eigenvector) and λ denotes the eigenvalue.

After this, a scree plot will be used to plot the components and their corresponding eigenvalues, to determine how many components will be retained. The scree plot might show an 'elbow curve', where a larger drop in eigenvalue is followed by a more diminishing decline. All components after the 'elbow curve-starting component' will be dropped (Catell, 1966). If a clear elbow curve cannot be determined, the 'Kaiser rule' will be applied, where all components with an eigenvalue below 1.0 will be discarded (Kaiser, 1960). This last method is based on the conception that factors with an eigenvalue below 1.0 will explain less variance than they will add.

Next, the determined number of PCA components will be inserted into the earlier used linear regression model, to see if there is a stronger effect on returns discernible. This will be calculated using the following formula:

$$R_t = \alpha + \beta_1 PC_1 + \beta_2 PC_2 + \beta_3 PC_3 + \epsilon_{i,t} \quad \text{with} \quad \epsilon \sim N(0, \sigma^2) \tag{4}$$

Lastly, the second research period will be examined using the same linear regression model. This model will keep all earlier used firm characteristics as control variables as well as the industry dummies to avoid omitted variable bias. To avoid multicollinearity issues, firms with a SIC code of 9999 (non-classifiable establishments) are left out of the models. Next to this, the domicile dummy to check for influence of a U.S. based firm will remain in this analysis. A financial firm dummy will be used to check if financial firms create a bias when included in the sample. After this, the model will be run again with a dummy for positive CSR score as main independent variable. This variable is also used by Lins et al., (2017) in their research extension and indicated there as 'High CSR'. They include this variable because of the non-linear results in the analysis of CSR quartiles and the smaller sample size in their second time period.[2] Although the number of observations in this part of the research does not differ substantially from the sample size in Part I, this dummy will be added to check for a stronger influence on returns.

3.2 Part III

3.2.1 Difference-in-differences model

Part III of the analysis will consist of Part I and II together, with pre- and post-crisis periods, covering the period from January 2007 to December 2018. This will be discussed further in Section 4. A difference-in-differences (DiD) model with constant treatment will be used to look into a possible variation in effect regarding the selected periods, similar to Lins et al., (2017). Any motivators leading up to the possible increased firm performances might be detected and endogeneity problems could then be mitigated. This data set consists of data on multiple firms in multiple years, and can therefore be considered as a panel data set. The DiD model will accordingly use time and firm fixed effects, to avoid omitted variable bias. First, the interaction between CSR score with a crisis dummy will be compared with a post-crisis dummy. Next, the crises will be studied separately, to see if it is possible to allocate influence to a specific crisis. This can be formulated in the following equations:

$$\begin{aligned} Return_{i,t} = b_0 + b_1 NetCSR_{i,t} \times \text{Crisis}_t + b_2 NetCSR_{i,t} \times \text{Post-Crisis}_t \\ + b_3\text{'}\mathbf{X}_{i,t-1} + \text{Time fixed effects} + \text{Firm fixed effects} + \epsilon_{i,t} \end{aligned} \tag{5}$$

[2] The sample in this part of their research consists of 412 observations, because of limited availability of CSR scores in the year 2000.

$$
\begin{aligned}
Return_{i,t} = b_0 + b_1 NetCSR_{i,2006} \times \text{Crisis}_1 + b_2 NetCSR_{i,2006} \\
\times \text{Post-Crisis}_1 + b_3 NetCSR_{i,2013} \times \text{Crisis}_2 + b_4 NetCSR_{i,2013} \\
\times \text{Post-Crisis}_2 + b_5\text{'}\mathbf{X}_{i,t-1} + \text{Time fixed effects} \\
+ \text{Firm fixed effects} + \epsilon_{i,t}
\end{aligned} \tag{6}
$$

Where $Crisis_t$ is a dummy variable which will be set to one during the crises in August 2008 to March 2009 (1) and July 2017 to June 2018 (2) and zero otherwise. $Post\text{-}crisis_t$ is a dummy variable which will be set to one during the periods outside of the crises, in January 2007 to July 2008 (1), April 2009 to December 2013 (1), January 2014 to June 2017 (2) and July 2018 to December 2018 (2) and zero otherwise.

'$\mathbf{X}_{i,t-1}$ is an inverse vector of the control variables, resembling Equation 2. Here, the variable *Idiosyncratic risk* is left out of the models, because of multicollinearity issues. All control variables will be updated each month for the market-based variables and each year for the accounting variables. Because of the added fixed effects feature, the errors will be clustered at firm level. Resembling the earlier models, micro-cap firms are deleted, as well as financial firms.

After examining the interaction between Net CSR and the different crisis periods, the CSR variable will be splitted again, following Lins et al., (2017). The variable will be separated in an internal and external stakeholder part (representing Employee Relations and Diversity for internal stakeholders and Community, Human Rights and Environment for external stakeholders). This division is made to determine from which CSR element stakeholders will derive the most trust.

3.2.2 Examining drivers of firm performance

Furthermore, the interaction term of CSR with the (Post-)Crisis dummy will be modelled against different drivers of firm performance, to examine underlying motivators of increasing financial health. First, the operational performance variables that will be used are Profitability, Gross margin, Sales growth, Accounts receivable divided by Sales and Sales per employee. These dependent variables are examined in the same way as the previous section, with a aggregated and separated (Post-)Crisis variable. The natural logarithm of Assets will be used as control variable and time and firm fixed effects will be taken into account. Subsequently, Employment growth will be studied, as raw number and winsorized within a range of -50% and +100%. The control variable *Ln(Assets)* as well as the fixed effects remain. Finally, capital raising variables are introduced into the models covering Long term debt issuance divided by Assets and Equity divided by Assets. To control for omitted variable bias the extra variables *Ln(Assets), Cash holdings* (lagged one month) *Total debt* (lagged one month) and *Profitability* are added. Similar to the previous models, time and firm fixed effects are included and the standard error will be clustered by firm.

3.3 Hypotheses development

The hypotheses for this research are mainly corresponding to the outcomes of the Lins et al., (2017) paper. This predicts companies which score high on CSR, receive higher valuations, are financial healthier and perform better financially. The hypotheses will be used to answer the research question of this paper.

3.3.1 Part I

The hypothesis of Part I will cover the first dip in trust in 2008, as this part focuses on this period. This hypothesis can be splitted into two sub-hypotheses.

H1: More trustworthy firms are higher valued during the trust shock in 2008 and have therefore a better financial health and performance.

H1a: More trustworthy firms achieve higher valuations from shareholders during the trust shock in 2008 measured by their stock price in that particular period.

H1b: More trustworthy firms have a better financial health during the trust shock in 2008 measured by their financial fundamentals in that particular period.

These hypotheses are derived from the results of the Lins et al., (2017) paper. Hypothesis 1a implicates a positive relationship between the returns and the main explanatory variable Net CSR. Hypothesis 1b predicts a positive relationship between the returns and all control variables, except the short and long term debt, (negative) book-to-market ratio, momentum and idiosyncratic risk variables. These variables are predicted to have a negative relationship with the dependent variable.

3.3.2 Part II

The hypothesis of Part II will cover the first dip in trust in 2018, as this part focuses on this more recent period. This hypothesis is similar to Hypothesis 1, and will also be splitted into two sub-hypotheses.

H2: More trustworthy firms are higher valued during the trust shock in 2018 and have therefore a better financial health and performance.

H2a: More trustworthy firms achieve higher valuations from shareholders during the trust shock in 2018, measured by their stock price in that particular period.

H2b: More trustworthy firms have a better financial health during the trust shock in 2018, measured by their financial fundamentals in that particular period.

The implications of these hypotheses are identical to the implications of Hypothesis 1, because of the extrapolation of the Lins et al., (2017) research.

3.3.3 Part III

The hypothesis of Part III will study both declines in trust, to determine their separated and aggregated influence on firm valuation, as well as drivers of increased firm performance. Hypothesis 3 will also be divided into two sub-hypothesis.

H3: More trustworthy firms are higher valued by shareholders, have a better financial performance and more capital raising abilities to account for their financial health and higher valuation, protecting them from shocks in economic trust.

H3a: More trustworthy firms achieve higher valuations from shareholders during the trust shocks in 2008 and 2018, measured by their stock price in this period.

H3b: More trustworthy firms have a better financial performance during trust shocks in 2008 and 2018, measured by specific performance measures in this period.

H3c: More trustworthy firms are able to raise more capital during trust shocks in 2008 and 2018, measured by specific capital raising measures in this period.

These hypotheses are derived from the results of the Lins et al., (2017) paper as well. Hypothesis 3a implicates a positive relationship between the returns and the interaction term of Net CSR with the (Post-)Crisis dummy. Hypothesis 3b implicates a positive relationship between the interaction term of Net CSR with the (Post-)Crisis dummy and the different performance measures. Hypothesis 3b predicts a positive relationship between the same explanatory variable and the capital raising measures used.

4 Data

4.1 Sample selection

As stated in the Introduction, this research will consist of three parts, examining the two declines in trust in the past two decades individually and together. In Figure 1, these declines are graphically represented, based on the Edelman Trust Barometer reports between 2001 and 2019. The qualitative research on trust by Edelman Intelligence is conducted between the end of October and the end of November of each year, forecasting the trust levels of the subsequent year (Edelman Intelligence, 2001-2019).

To examine the influence of CSR on firm performance, three cross-sectional data sets on the CSR score per firm, financial elements per firm and the returns over a designated time period will be combined. This will be analyzed for both crisis periods, whereafter the cross-sectional data sets will be aggregated into one panel data set to compare both crisis periods.

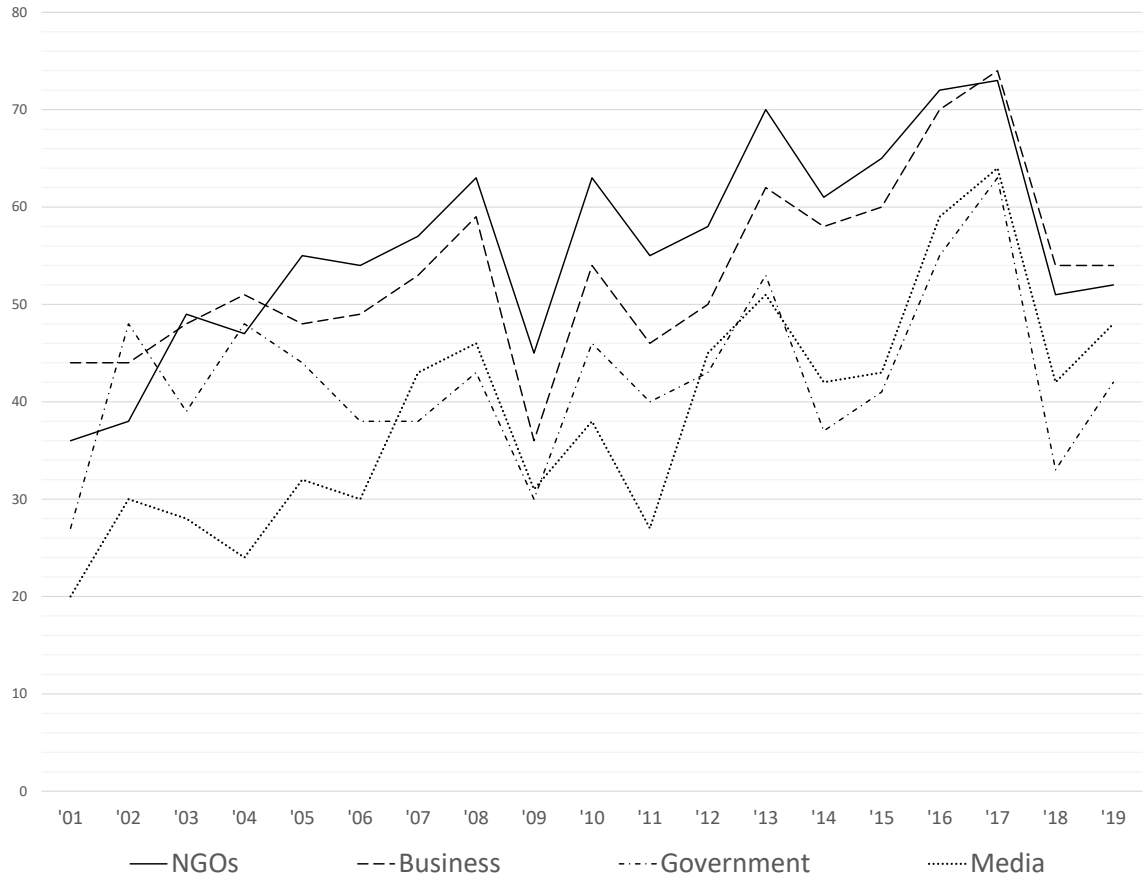
Part I of the research conducted in this paper will define the first trust dip during the financial crisis as the period from August 2008 to March 2009. This period includes the bankruptcy of Lehman Brothers in September 2008, the research period of Edelman Intelligence in November 2008 and the lowest point of the S&P500 in the financial crisis period in March 2009. Other researches and reports also regard this time as a period of a drastic decline in trust (Edelman Intelligence, 2009; Lins, Volpin, & Wagner, 2013; Sapienza & Zingales, 2012).

Part II of the research will define the crisis period of decline in trust in 2018 as the period from July 2017 to March 2018, looking at one quarter before (Q3 in 2017) and after (Q1 in 2018) the researching period of Edelman Intelligence in the fourth quarter of 2017. The S&P 500 does not show a severe decline in the last two quarters of 2017, and does therefore presumably not affect the outcome of the qualitative research.[3] Nevertheless, politically charged events occurred during this period, including a mass shooting in Las Vegas and the ongoing FBI investigation into Russia's influence on the election of Donald Trump as President since the start of 2017. Political events outside of the U.S. consist of preparations for Brexit negotiations. A large social event was the upcoming Me Too movement, protesting against sexual assault and harassment. This implies that this specific trust crisis has possibly no economic motive but more likely a political and social cause. Lins et al., (2017) adds the Enron/Worldcom fraud scandals in the period October 2001–March 2003 as extension to their research.

Part III of the research combines both crisis periods and will therefore include a panel data set involving the period January 2007–December 2018. Again, financial fundamentals and returns will be combined in this data set. Extra variables on financial fundamentals will be obtained, to examine drivers of excess returns in this part of the research.

[3]See Bloomberg S&P 500 Index via `https://www.bloomberg.com/quote/SPX:IND`.

Figure 1: Edelman Trust Barometer in the U.S. between 2001 – 2019



Note: The information for this figure is retrieved from the Global Reports of the Edelman Trust Barometer in the years 2001 until 2019. The scores per institution are given by an informed population in October and November of the preceding year.

A sample selection bias can never fully be avoided, because of the dependence on availability of data within the relevant databases.

4.2 Data sources

The used data sources are all consulted via the Wharton Research Data Services (WRDS) database. The CSR data for this research will be obtained from the MSCI Environmental, Social and Governance (ESG) statistics database. This database consists of ratings of the approximately 3,000 largest publicly traded companies in the U.S. For Part II of the database, it is preferable to use 2015 data. Nevertheless, the specific manner of qualifying CSR scores in these categories is only used until 2013. The alternative ASSET4 database is also unable to provide this requested data. Therefore, the year 2013 will be used as benchmark to examine the influence on returns in 2017/2018.

The stock trading information will be assembled from the Center for Research in Security Prices (CRSP). The monthly stock prices are used to calculate crisis-period returns in Part I and II of the paper. Part III will use monthly returns. Hereby, firms in the financial industry will be excluded in the data sets of Part I and Part III, because of the governmental support they received during the financial crisis. Nevertheless, these firms are not excluded in Part II of this research, because of their supposedly 'normal' role in this time period. A dummy will be included to check the plausibility of this statement. Next to this, the stocks with a market capitalization of under $250 million (also known as micro-cap stocks), will be excluded from the sample because of their high bid-ask spreads and common illiquidity. These characteristics imply that these firms are more prone to price pressure effects of trading, specifically during a financial crisis. This will be the same approach as in Lins et al., (2017).

The information about firm financial performance will be obtained from the Compustat Quarterly Industrial file. These fundamentals will be used as control variables in Part I and II, and control and dependent variables in Part III of the research. They resemble the financial health of the relevant firm, as well as other characteristics that might affect stock returns. The last quarter of 2007 respectively 2016 or, if missing, the last quarter available in 2007 respectively 2016 will be used to represent the data of the relevant year in Part I and II. Each last quarter available per year between 2007 and 2018 will be used to represent the data in Part III of the research.

4.3 Sample construction

In this section, the construction of the data sets as well as the different variables are discussed. Detailed information on the construction of the cross-sectional and panel data sets can be found in Table I. Only explanatory variables with non-missing observations will be used for the analysis, therefore it is important to check for patterns before dropping missing variables. The analysis on missing values results in no distinguishable patterns, thus a sample selection bias can presumably be avoided. The number of identical duplicates, which are dropped to avoid merging problems, is negligible, accordingly this would presumably avert a sample selection bias as well.

4.3.1 Net CSR variable

The MSCI CSR scores are divided in twelve different categories: Community (1), Diversity (2), Employee relations (3), Environment (4), Human rights (5), Corporate governance (6), Product (7), Alcohol (8), Gambling (9), Firearms (10), Military (11), Nuclear (12) and Tobacco (13). The categories 8-13 will not be used, because of their industry related characteristics and the common negative perception of it. Firstly, because Lins et al., (2017) controlled for industry in all their tests, this paper will do similarly. Secondly, because of their negative perception, firms could only increase their CSR score by exiting the particular industries. The product category (7) is excluded because of

Table Ia: Sample construction for Part I

	Total firms	Total obs.
MSCI database		
All CSR scores between 2005-2016 to construct Figure 2	8,451	38,428
Delete observations outside of 2006	(5,488)	(35,456)
Delete identical duplicates	(0)	(9)
Total sample MSCI database	**2,963**	**2,963**
CRSP database		
All stock info between Aug 2003 - Jul 2008 to construct β	9,569	421,925
All stock info between Aug 2007 - Jul 2008 to construct *Momentum*	7,593	85,769
All stock info between Aug 2008 - Mar 2009 to construct returns	7,172	55,619
Delete non-matching data with β & *Momentum*	(703)	(5,162)
All return over crisis-period information on March 2009	6,156	6,156
Delete identical duplicates	(0)	(0)
Total sample CRSP database	**6,156**	**6,156**
Compustat database		
All financial information between Jan 2007 - Dec 2007	11,521	44,033
Delete observations with no last quarter information	(0)	(32,505)
Delete observations with a market cap < $250 mln	(5,266)	(5,266)
Delete identical duplicates	(0)	(8)
Total sample Compustat database	**6,255**	**6,255**
Merge databases		
CRSP database between Aug 2008 - Mar 2009	6,156	6,156
Delete non-matching data with MSCI database	(4,321)	(4,321)
CRSP database merged with MSCI database	1,835	1,835
Delete non-matching data with Compustat	(255)	(255)
CRSP & MSCI database merged with Compustat	1,580	1,580
Delete observations characterized as Financial firm	(328)	(328)
Delete missing observations for *Abnormal returns*	(5)	(5)
Delete missing observations for *L/T debt*, *S/T debt*, *Cash holdings*, *Profitability*, *Market capitalization* and *Book-to-Market ratio*	(138)	(138)
Total sample of observations	**1,109**	**1,109**

Note: This table shows the sample construction process of Part I of the research. The amount between parentheses indicate a negative number of observations.

Table Ib: Sample construction for Part II

	Total firms	Total obs.
MSCI database		
All CSR scores between 2005-2016 to construct Figure 2	8,451	38,428
Delete observations outside of 2013	(3473)	(33,448)
Delete identical duplicates	(0)	(2)
Total sample MSCI database	**4,978**	**4,978**
CRSP database		
All stock info between Jul 2012 - Jun 2017 to construct β	9,470	426,905
All stock info between Jul 2016 - Jun 2017 to construct *Momentum*	7,783	87,610
All stock info between Jul 2017 - Mar 2018 to construct returns	7,825	66,568
Delete non-matching data with β & *Momentum*	(1,042)	(7,008)
All return over crisis-period information on March 2018	6,482	6,482
Delete identical duplicates	(0)	(0)
Total sample CRSP database	**6,482**	**6,482**
Compustat database		
All financial information between Jan 2016 - Dec 2016	11,854	45,560
Delete observations with no last quarter information	(0)	(33,706)
Delete observations with a market cap < $250 mln	(4,191)	(4,191)
Delete identical duplicates	(0)	(0)
Total sample Compustat database	**7,663**	**7,663**
Merge databases		
CRSP database between Jul 2017 - Mar 2018	6,482	6,482
Delete non-matching data with MSCI database	(4,761)	(8,018)
CRSP database merged with MSCI database	1,721	1,721
Delete non-matching data with Compustat	(117)	(117)
CRSP & MSCI database merged with Compustat	1,604	1,604
Delete missing observations for *Abnormal returns*	(3)	(3)
Delete if SIC code = 9999[1]	(68)	(68)
Delete missing observations for *L/T debt*, *S/T debt*, *Cash holdings*, *Profitability*, *Market capitalization* and *Book-to-Market ratio*	(267)	(267)
Total sample of observations	**1,266**	**1,266**

[1] These observations are deleted to avoid multicollinearity.
Note: This table shows the sample construction process of Part II of the research. The amount between parentheses indicate a negative number of observations.

Table Ic: Sample construction for Part III

	Total firms	Total obs.
CRSP database		
All stock info between Jan 2002 - Dec 2018 to construct β	15,281	1,443,106
All stock info between Jan 2007 - Dec 2018 to construct dummies	8,549	675,652
- Create Crisis_1 dummy between Aug 2008 - Mar 2009		35,242
- Create Post-crisis_1 dummy between Jan 2007 - Jul 2008		86,730
- Create Post-crisis_1 dummy between Apr 2009 - Dec 2013		263,017
- Create Crisis_2 dummy between Jul 2017 - Jun 2018		43,888
- Create Post-crisis_2 dummy between Jan 2014 - Jun 2017		202,813
- Create Post-crisis_2 dummy between Jul 2018 - Dec 2018		43,962
Delete identical duplicates	(0)	(0)
Total sample CRSP database	**8,549**	**675,652**
Compustat database		
All financial info between Jan 2006 - Dec 2018	20,826	584,046
Delete observations with no last quarter information	(0)	(432,545)
Delete observations with a market cap. $<$ \$250 mln	(5,765)	(63,737)
Delete identical duplicates	(0)	(91)
Total sample Compustat database	**15,061**	**87,673**
Merge databases		
CRSP database between Jul 2007 - Dec 2018	8,549	675,652
Include MSCI 2006 data between Jan 2007 - Dec 2013		384,989
Include MSCI 2013 data between Jan 2014 - Dec 2018		290,663
Delete only non-matching data from Compustat	(0)	(51,527)
CRSP & MSCI database merged with Compustat	8,549	675,652
Missing observations for *Net CSR* between Jan 2007 - Dec 2013		(218,883)
Missing observations for *Net CSR* between Jan 2014 - Dec 2018		(177,895)
Delete total missing observations for *Net CSR*	(5,608)	(369,778)
Delete missing observations for *L/T debt*, *S/T debt*, *Cash holdings*, *Profitability*, *Market capitalization* and *Book-to-Market ratio*	(960)	(72,806)
Delete observations characterized as Financial firm	(183)	(19,253)
Total sample of observations	**1,789**	**186,815**

Note: This table shows the sample construction process of Part III of the research. The amount between parentheses indicate a negative number of observations.

the vague contribution to a firm's CSR. Nevertheless, Lins et al., (2017) controlled for its potential influence, which was not significant.

The corporate governance category (6) could be seen as governmental influence and is considered as not-contributing to a firm's CSR orientation. However, it is taken into account by Lins et al., (2017), when performing robustness tests because it presumably influences trust in a firm on an individual or aggregated level.

What is left are the five stakeholder related categories, which are also used in other researches on Corporate Social Responsibility and could additionally be linked to the trustworthiness of firms (Servaes & Tamayo, 2013).

To replicate Lins et al., (2017), first an equally weighting measure is used to confirm the influence of the net CSR on raw as well as abnormal returns. Hereby, they take into account the variation in maximum CSR score each individual category could receive per year, whereas they divide each score by the maximum score that can be obtained in this specific year. This results in an index score per category, varying between zero and one. After this, strengths and concerns will be aggregated, resulting in a net CSR index varying between -1 and +1. Finally, all five categories are totaled, to result in a CSR measure varying between -5 and +5. This calculation could be summarized in the following formula:

$$NetCSR_{i,t} = \sum \left(\frac{Number\ of\ strengths_{c,i,t}}{Maximum\ number\ of\ strengths_{c,t}} - \frac{Number\ of\ weaknesses_{c,i,t}}{Maximum\ number\ of\ weaknesses_{c,t}} \right) \tag{7}$$

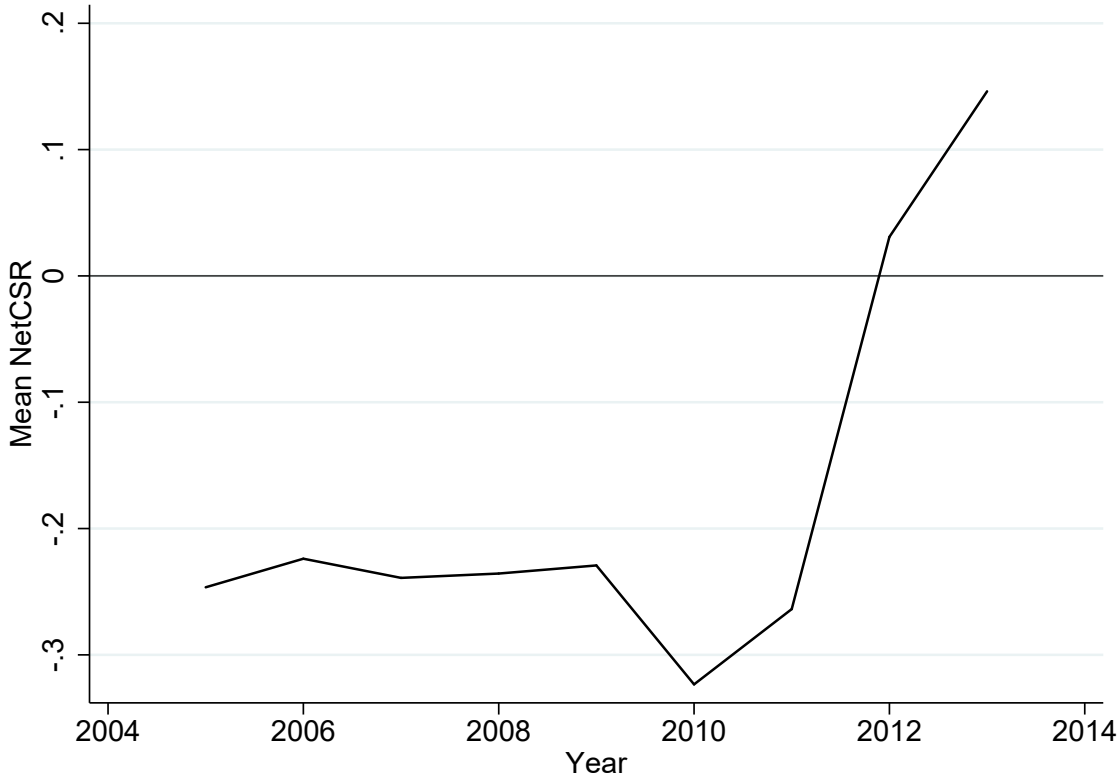
Where c denotes the relevant previously mentioned individual category of CSR: Community, Diversity, Employee relations, Environment or Human rights. Next to this, i denotes the company who received the score and t the year in which the score is received.

For the first part of the research, the year that will be used is 2006, to correct for firms who altered their CSR investments anticipating the financial crisis. For the second part of the study, the year 2013 will be used. This year is determined because of the restricted availability of the CSR data in the MSCI database. To circumvent possible anticipation but also take the score which is most adjacent to the trust dip, the year 2015 would be ideal. The more recent data in the database provide country codes per company. To replicate the Lins et al., (2017) study, the assumption is made that all MSCI firms have the U.S. as country of residence. However, with the domicile attribute, foreign influence could be measured. Therefore, an extra variable *Dummy U.S. firms* will be added, to assess this effect.

Figure 2 shows the mean distribution of the calculated net CSR variable. While Lins et al., (2017) assume a more constant trend of the CSR score, - which is likely because of the scope of their research - this figure shows an exponential rising trend starting in 2010. Presumably investments in

CSR dropped in 2010 because of the preceding financial crisis, whereafter it gained popularity and increased above zero.

Figure 2: Distribution of the Net CSR mean between 2005 – 2013



Note: The mean Net CSR per year is displayed in this figure, with an extra axis on x = 0, to indicate the moment the mean intersects this number.

4.3.2 Raw and abnormal return variables

The return measures that will be used are *Research-period Raw Return* and *Research-period Abnormal Return*. The raw return is a firms' relative raw buy-and-hold return for the mentioned time frames August 2008 to March 2009 and July 2017 to March 2019. This can be formulated as follows:

$$R_i = \frac{Price_{t\_end,i} - Price_{t\_begin,i}}{Price_{t\_begin,i}} \tag{8}$$

Where i denotes the individual company and respectively *t_begin* and *t_end* the begin and end dates of the corresponding periods. In this calculation, distributed dividends are not excluded from the price.

Next to this, the abnormal return is calculated by the difference between the raw and the expected

return. The expected return will be approached by use of the classic Capital Asset Pricing Model (CAPM, Black, 1972; Lintner, 1965; Sharpe, 1964):

$$R_{i,t} = R_{f,t} + \beta_i(R_{m,t} - R_{f,t}) + \varepsilon_{i,t} \tag{9}$$

The systematic risk factor (β) for each individual company (i), will be calculated by regressing the returns of this company over a 60-month period up until July 2008 and June 2017. To approximate the expected market return ($E(R_m)$), the return on a CRSP value weighted market portfolio including dividends will be used. R_f denotes the risk free rate, which equals the 5-year Treasury Yield Curve. The rate of 3.25 on the 31^{st} of July 2008 will be used in Part I and the rate of 1.89 on the 30^{th} of June 2017 will be used in Part II. Monthly updated rates will be used in Part III (U.S. Department of the Treasury, 2019). The calculation of abnormal returns might differ from the calculation of Lins et al., (2017), who use a market model-adjusted return to calculate the abnormal returns. Both the raw and abnormal returns are winsorized at the 1^{st} and 99^{th} percentiles, to avert outlier issues. The residual variance resulting from the preceding CAPM model, will be used as *Idiosyncratic risk* variable.

4.3.3 Financial fundamentals

The financial health of a firm will be used to control for omitted variable bias. This will be measured with the fundamentals *Long-term debt*, *Short-term debt* (in current liabilities), *Cash holdings* (including marketable securities) and *Profitability* (based on Return on Assets) in Part I and II of the research.

Other known characteristics that affect stock returns are Size, Book-to-Market ratio and a Momentum factor (Fama & French, 1992). This results in the variables *Ln(Market capitalization)* as Size factor and *Book-to-Market (B/M) ratio* as well as *Dummy negative B/M ratio*. *Momentum* is the raw return, calculated in the same way as subsection 4.3.2, seeing on the year between August 2007 and July 2008, as well as July 2016 and June 2017. All control variables are winsorized at the 1^{st} and 99^{th} percentiles, to avert outlier issues, equivalent to the Lins et al., (2017) approach.

Part III of the research will examine the drivers behind excess returns, studying the influence of net CSR on respectively the earlier used *Profitability*, *Gross margin (in percentage)*, *Sales growth (in percentage)*, *Accounts receivable divided by Sales (in percentage)*, *Sales per employee*, *Employee growth*, *Long-term debt issuance* and *Equity issuance*. While Lins et al., (2017) name the first variable *Operating Return on Assets (in percentage)*, the calculation of this element is identical to the calculation of *Profitability*. To avoid confusion and maintain coherence throughout this paper, the term *Profitability* will be used. The control variables used in these models are *Ln(Assets)*, *Cash holdings (lagged one month)*, *Total debt (lagged one month)* and *Profitability*. All variables are obtained on a monthly basis, except for (*Sales per Employee* and *Employee growth*), which is

retrieved on a yearly basis. The formulas regarding the calculation of all financial fundamental variables will be found in Appendix A.1.

4.4 Descriptive statistics

In Table II, the descriptive statistics for all used variables in the three parts of the research can be found. Table IIa presents the opportunity to compare the differences between the two identified crisis periods. The three main variables *Net CSR*, *Crisis-period Raw return* and *Crisis-period Abnormal return* show a negative mean with a value of respectively -0.241, -0.421 and -0.524 for Part I of the research, and 0.047, 0.078 and 0.104 for Part II.

These first numbers show a considerable improvement in net CSR score, consistent with the mean distribution in Figure 2. The negative mean of the net CSR variable in Part I could be explained by the higher occurrence of concerns compared to strengths per category, consistent with Lins et al., (2017) and their resources.[4] The absolute value differs, however, from Lins et al., (2017), who report a mean of -0.165. This difference could be explained by the contrast in observations, with 1,109 in this paper, and 1,673 firms in Lins et al., (2017). The coherence of the positive net CSR mean in Part II with Figure 2 implies an evenly distributed sample. However, companies with a lower CSR score are more pronounced in this data set, therefore the mean is slightly lower in comparison with Figure 2.

The negative means of *Raw return* and *Abnormal return* in Part I of the analysis could be explained by the financial crisis. According to Lins et al., (2017), these means are an indication that investors were, among other things, expected to be distressed about the negative forecasts regarding the survival of the firms in their portfolio. This contradicts the relatively low *Book-to-market ratio*, which, with a value less than one, indicates an overvaluation.

The difference in control variable means between Part I and Part II of the data could be explained anew by the specific economic cycle. This applies to *Market capitalization* (almost twofold in size in Part II), *Long-term debt* (lower in Part I, where it is more complicated to obtain a long term loan) and *Momentum* (negative in Part I during the financial crisis while positive in Part II).

Part III of the research covers a more extensive time period of 11 years, showed in Table IIb. The mean Net CSR variable is slightly positive, and higher than the mean of Net CSR in Part II. This could imply the presence of firms with a higher Net CSR score in this part of the data set, opposed to Part II of the analysis.

The dummies for *Crisis* and *Post-crisis* have a mean of respectively 0.113 and 0.887. This shows that the crisis periods cover a relatively short time, in comparison with the post-crisis periods. To attain the effect of the crises optimally, the crisis and post-crisis dummies will therefore be separated in a *Dummy (Post–)Crisis*$_1$ and a *Dummy (Post–)Crisis*$_2$.

[4] See Deng, Kang & Low (2013), Servaes & Tamayo (2013) and Borisov, Goldman & Gupta (2016).

Table IIa: Descriptive Statistics of Part I and II

		Mean	Std. dev.	25th perc.	Median	75th perc.
Part I	Net CSR 2006	-0.240	0.519	-0.500	-0.250	0.000
	Crisis-period Raw Return	-0.421	0.245	-0.584	-0.419	-0.276
	Crisis-period Abnormal Return	-0.524	0.252	-0.698	-0.521	-0.371
	Market capitalization	6,994	19,308	624	1,418	4,155
	Long-term debt	0.190	0.190	0.007	0.161	0.287
	Short-term debt	0.028	0.053	0.000	0.005	0.030
	Cash holdings	0.116	0.133	0.023	0.070	0.158
	Profitability	0.034	0.033	0.022	0.034	0.049
	Book-to-market ratio	0.428	0.288	0.237	0.368	0.565
	Momentum	-0.106	0.348	-0.327	-0.134	0.060
	Idiosyncratic risk	0.034	0.142	-0.051	0.035	0.116
	Dummy negative B/M ratio	0.024	0.154	0.000	0.000	0.000
	Dummy U.S. firm	0.647	0.478	0.000	1.000	1.000
Part II	Net CSR 2013	0.047	0.619	-0.333	0.000	0.333
	Crisis-period Raw Return	0.078	0.269	-0.068	0.056	0.211
	Crisis-period Abnormal Return	0.104	0.273	-0.053	0.078	0.241
	Market capitalization	13,253	28,798	1,270	3,185	10,349
	Long-term debt	0.252	0.195	0.106	0.235	0.358
	Short-term debt	0.031	0.062	0.000	0.009	0.032
	Cash holdings	0.107	0.111	0.027	0.071	0.149
	Profitability	0.030	0.029	0.018	0.029	0.042
	Book-to-market ratio	0.399	0.299	0.201	0.350	0.548
	Momentum	0.122	0.304	-0.053	0.092	0.276
	Idiosyncratic risk	0.008	0.071	-0.034	0.005	0.048
	Dummy negative B/M ratio	0.042	0.200	0.000	0.000	0.000
	Dummy U.S. firm	0.874	0.332	1.000	1.000	1.000
	Dummy financial firm	0.100	0.301	0.000	0.000	0.000

Note: The sample of Part I consists of 1,109 and 1,266 observations with CSR data available from the MSCI ESG Stats database as of respectively year-end 2006 and 2013, returns available during the periods of respectively August 2008 to March 2009 and July 2017 and March 2018 and financial fundamental data avaiable from the Compustat database as of the last (available) quarter of respectively 2007 and 2016. All variables except net CSR are winsorized at the 1^{st} and 99^{th} percentiles. Market capitalization is in millions of dollars.

Table IIb: Descriptive Statistics of Part III

		Mean	Std. dev.	25th perc.	Median	75th perc.
Part III	Net CSR	0.072	0.426	0.000	0.000	0.050
	Dummy Crisis period	0.113	0.317	0.000	0.000	0.000
	Dummy Post–crisis period	0.887	0.317	1.000	1.000	1.000
	Raw Return	0.011	0.107	-0.049	0.009	0.066
	Abnormal Return	0.495	1.422	-0.298	0.282	1.003
	Market capitalization	9,486	23,768	703	1,917	6,348
	Long-term debt	0.212	0.188	0.036	0.193	0.319
	Short-term debt	0.025	0.047	0.000	0.006	0.030
	Cash holdings	0.122	0.124	0.030	0.084	0.173
	Profitability	0.032	0.033	0.021	0.032	0.046
	Book-to-market	0.449	0.316	0.233	0.399	0.613
	Momentum	0.109	0.411	-0.136	0.068	0.285
	Idiosyncratic risk	-0.002	0.092	-0.053	-0.004	0.044
	Dummy negative B/M	0.034	0.181	0.000	0.000	0.000
	Gross margin	0.346	0.455	0.230	0.362	0.539
	Sales growth	0.049	0.229	-0.049	0.020	0.098
	Accounts receivable / Sales	-0.025	0.137	-0.070	-0.017	0.022
	Sales per employee	134	167	53	82	141
	Total assets	10,069	32,470	743	1,999	6,352
	Employee growth	0.068	0.660	-0.020	0.029	0.096
	Employee growth within range	0.049	0.151	-0.020	0.028	0.095
	Long-term debt issuance	0.099	0.178	0.000	0.015	0.116
	Equity issuance	0.073	0.109	0.021	0.039	0.075

Note: The sample consists 186,815 observations for the variables except the following: 186,064 observations for Sales growth, 180,008 observations for Sales per employee, 186,356 observations for Gross margin, 174,515 observations for Accounts receivable divided by Sales, 14,852 observations for total assets, 14,105 observations for Employee growth, 13,943 observations for Employee growth within the -50% to +100% range. 185,786 observations for Long-term debt issuance and 184,769 observations for Equity issuance. All variables except net CSR, Employee growth and Employee growth within the -50% to +100% range are winsorized at the 1^{st} and 99^{th} percentiles. Market capitalization and Total assets are in millions of dollars and Sales per employee in dollars.

Table IIIa refers to the correlation matrices for Part I and II of the research. The correlation matrix for Part I of the research resembles the correlation matrix created by Lins et al., (2017). Nonetheless, the high correlation between *Raw return* and *Abnormal return* stands out. This means that the upwards deviation from the mean of Raw returns is almost identical to the upwards deviation from the mean of Abnormal returns and vice versa. This diversion from the mean can be defined by the error terms, which consist of the same unexplained parts of both raw and abnormal return. The similarity in error terms can logically be clarified by their interdependence, as mentioned in Section 4.3.2.

Ln(Market capitalization) yields a relatively high correlation with Net CSR, specifically in Part II of the research. This implies that companies with a larger amount of equity are achieving higher CSR scores, and might be more inclined to invest in social capital. Next to this, a considerable high correlation between *Dummy negative B/M ratio* and *Long-term debt* draws attention in both parts (with 0.39 and 0.45 respectively). This implies that companies who suffer from losses and have therefore a negative book value, are less capable of attracting long-term debt. The reverse occurs with *Cash holdings* and *Long-term debt*, with values of respectively -0.29 and -0.30.

As discussed shortly previously, the sample size in Part I of the research differs from the original paper by Lins et al., (2017), with respectively 1,109 and 1,673 observations. This means the outcome of this current research could reflect differently. Part II of the research does not refer to Lins et al., (2017). Nevertheless, the number of observations is resembling the total of firms in the first part. Because of the random selection of the sample, a selection bias can be excluded and the sample could therefore be assumed to be valid.

Furthermore, Tables IIIb and IIIc show the correlation matrix for Part III of the research. The low correlation between raw and abnormal returns in comparison with Part I and II of the research draws attention. This might be explained by the longer research period and the monthly calculation of the raw returns, regarding to the crisis-period raw returns in Table IIIa.

Next to this, *Ln(Assets)* yields a high correlation with *Ln(Market capitalization)*, because of their inter-connectivity. The correlation of 0.41 between *Ln(Assets)* and *Net CSR* supports the earlier statement of the assumed relationship between (equity) capital and Net CSR score.

A high correlation between *Raw return* and *Idiosyncratic risk* can be motivated by the monthly calculation of the raw return variable, in comparison with the correlation for these variables in Table IIIa. *Idiosyncratic risk* is calculated as the error term from the CAPM model, as discussed in Section 4.3.2, which results in the same behavior as the Raw and Abnormal return in Part I and II.

Lastly, Table IIIc shows the remaining correlation numbers of Part III. The negative outcome of -0.27 between *Equity issuance* and *Gross margin* can be explained by the earnings a firm makes with a high gross margin, diminishing the need for equity. This is also visible in the correlation of 0.54 between *Gross margin* and *Profitability* in Table IIIb.

Table IIIa: Correlation Matrix of Part I and II

		Net CSR	Raw ret.	Abn. ret.	Ln (Mkt Cap)	L/T debt	S/T debt	Cash hold.	Profit.	B/M	Mom.	Idio. Risk	Dum neg. B/M	Dum non-U.S.
Part I	Raw Return	0.10	·	·	·	·	·	·	·	·	·	·	·	·
	Abn. Return	0.11	0.99	·	·	·	·	·	·	·	·	·	·	·
	Ln(Mkt cap)	0.21	0.11	0.14	·	·	·	·	·	·	·	·	·	·
	L/T debt	-0.06	-0.14	-0.13	0.05	·	·	·	·	·	·	·	·	·
	S/T debt	0.06	0.03	0.04	0.13	0.03	·	·	·	·	·	·	·	·
	Cash holdings	0.03	0.05	0.01	-0.18	-0.29	-0.10	·	·	·	·	·	·	·
	Profitability	0.08	0.04	0.06	0.22	-0.06	-0.03	-0.17	·	·	·	·	·	·
	B/M ratio	-0.08	-0.11	-0.10	-0.26	-0.08	-0.01	-0.21	-0.24	·	·	·	·	·
	Momentum	-0.10	-0.06	-0.02	0.06	-0.09	-0.03	-0.05	0.11	-0.15	·	·	·	·
	Idio. risk	0.04	0.18	0.19	-0.25	-0.08	0.04	0.15	-0.21	0.03	0.01	·	·	·
	Dum -/- B/M	-0.02	-0.02	-0.02	-0.05	0.39	0.06	0.01	0.02	-0.30	-0.05	-0.00	·	·
	Dum U.S. firm	0.05	0.13	0.14	0.28	-0.06	0.07	-0.08	0.09	-0.03	0.01	-0.04	-0.02	·
Part II	Raw Return	-0.03	·	·	·	·	·	·	·	·	·	·	·	·
	Abn. Return	-0.04	1.00	·	·	·	·	·	·	·	·	·	·	·
	Ln(Mkt cap)	0.55	-0.04	-0.06	·	·	·	·	·	·	·	·	·	·
	L/T debt	0.05	-0.03	-0.02	0.12	·	·	·	·	·	·	·	·	·
	S/T debt	0.09	-0.01	-0.01	0.07	-0.01	·	·	·	·	·	·	·	·
	Cash holdings	-0.08	0.12	0.13	-0.17	-0.30	-0.12	·	·	·	·	·	·	·
	Profitability	0.10	0.00	-0.02	0.18	0.03	-0.01	-0.04	·	·	·	·	·	·
	B/M ratio	-0.11	-0.05	-0.05	-0.27	-0.20	0.04	-0.19	-0.25	·	·	·	·	·
	Momentum	-0.03	0.11	0.12	-0.03	-0.04	0.07	0.16	0.01	-0.13	·	·	·	·
	Idio. risk	-0.10	0.07	0.08	-0.19	0.02	0.02	0.06	-0.15	0.12	0.03	·	·	·
	Dum -/- B/M	0.05	-0.01	-0.01	-0.01	0.45	0.04	0.05	0.07	-0.36	0.03	0.04	·	·
	Dum U.S. firm	-0.08	0.09	0.09	-0.08	-0.04	-0.02	0.08	0.03	-0.11	0.08	-0.01	-0.02	·
	Dum fin. firm	-0.00	-0.03	-0.02	-0.01	-0.10	0.19	-0.02	-0.14	0.27	0.05	0.12	-0.06	-0.05

Note: The sample consists of respectively 1,109 and 1,266 firms with CSR data available from the MSCI ESG Stats database as of respectively year-end 2006 and 2013, and returns available during the periods of respectively August 2008 to March 2009 and July 2017 and March 2018.

Table IIIb: Correlation Matrix of Part III

		Net CSR	Dum Cr.	Dum Post-cr.	Raw ret.	Abn. ret.	Ln (Mkt Cap)	L/T debt	S/T debt	Cash hold.	Profit.	B/M
Part IIIa	Dummy Crisis	0.01	·	·	·	·	·	·	·	·	·	·
	Dummy Post-crisis	-0.01	-1.00	·	·	·	·	·	·	·	·	·
	Raw Return	-0.01	-0.08	0.08	·	·	·	·	·	·	·	·
	Abn. Return	-0.12	-0.00	0.00	0.05	·	·	·	·	·	·	·
	Ln(Mkt cap)	0.44	0.00	-0.00	0.02	-0.21	·	·	·	·	·	·
	L/T debt	0.05	0.02	-0.02	-0.01	0.01	0.15	·	·	·	·	·
	S/T debt	0.09	0.01	-0.01	-0.00	-0.04	0.11	0.07	·	·	·	·
	Cash holdings	-0.06	-0.01	0.01	0.02	0.14	-0.19	-0.29	-0.11	·	·	·
	Profitability	0.09	-0.00	0.00	0.03	-0.12	0.20	-0.03	-0.01	-0.13	·	·
	B/M ratio	-0.10	0.03	-0.03	-0.09	0.08	-0.26	-0.16	-0.05	-0.20	-0.18	·
	Momentum	-0.03	-0.15	0.15	0.25	0.07	0.01	-0.02	-0.01	0.07	0.05	-0.20
	Idio. risk	0.01	0.02	-0.02	0.83	0.06	0.01	-0.01	0.00	0.01	0.02	-0.04
	Dum -/- B/M	0.02	0.01	-0.01	0.00	0.03	-0.02	0.40	0.05	0.05	0.02	-0.34
	Gross margin	0.06	0.00	-0.00	0.01	-0.08	0.13	0.00	-0.01	-0.08	0.54	-0.05
	Sales growth	-0.01	-0.01	0.01	0.02	0.04	-0.01	-0.02	-0.01	0.10	0.16	-0.07
	Acc. rec. / Sales	0.02	0.02	-0.02	-0.03	0.02	-0.02	0.01	0.00	-0.03	-0.06	0.13
	Sales / empl.	0.02	0.01	-0.01	-0.01	-0.04	0.21	0.09	0.05	-0.08	0.05	0.07
	Ln(Assets)	0.41	0.02	-0.02	-0.02	-0.16	0.88	0.31	0.15	-0.38	0.11	0.07
	Empl. growth	-0.03	-0.01	0.01	-0.00	0.01	-0.01	0.00	-0.00	0.02	-0.00	-0.04
	Empl. gr. range	-0.08	-0.04	0.04	-0.03	0.02	0.02	-0.04	-0.03	0.07	0.01	-0.15
	L/T debt iss.	-0.06	0.00	-0.00	-0.01	0.03	-0.05	0.38	0.05	-0.21	0.03	-0.04
	Equity issuance	-0.11	-0.01	0.01	0.01	0.15	-0.31	-0.16	-0.07	0.45	-0.34	-0.24

Note: The sample consists of respectively 1,109 and 1,266 firms with CSR data available from the MSCI ESG Stats database as of respectively year-end 2006 and 2013, and returns available during the periods of respectively August 2008 to March 2009 and July 2017 and March 2018.

Table IIIc: Correlation Matrix of Part III (continued)

		Mom.	Idio. risk	Dum neg. B/M	Gr. mar.	Sal. gr.	Acc rec. / Sal.	Sal. p/e	Ln (As)	Empl. gr.	Empl. gr. range	L/T debt iss.
Part IIIb	Idiosyncratic risk	0.16	·	·	·	·	·	·	·	·	·	·
	Dummy -/- B/M	0.00	0.00	·	·	·	·	·	·	·	·	·
	Gross margin	0.00	0.01	-0.04	·	·	·	·	·	·	·	·
	Sales growth	0.04	-0.00	0.00	0.04	·	·	·	·	·	·	·
	Acc. rec. / Sales	-0.13	-0.01	-0.00	-0.02	-0.19	·	·	·	·	·	·
	Sales / employee	-0.00	-0.01	0.02	0.04	0.11	-0.05	·	·	·	·	·
	Ln(Assets)	-0.05	-0.01	-0.03	0.10	-0.05	0.05	0.26	·	·	·	·
	Employee growth	0.02	-0.01	-0.01	-0.00	0.05	-0.07	-0.01	-0.03	·	·	·
	Empl. growth range	0.06	-0.06	-0.04	0.01	0.14	-0.23	-0.00	-0.09	1.00	·	·
	Long-term debt iss.	0.00	-0.01	0.12	-0.01	0.01	-0.04	0.01	0.02	0.03	0.08	·
	Equity issuance	0.03	0.01	0.13	-0.27	0.11	-0.06	-0.08	-0.49	0.02	0.07	-0.09

Note: The sample consists of respectively 1,109 and 1,266 firms with CSR data available from the MSCI ESG Stats database as of respectively year-end 2006 and 2013, and returns available during the periods of respectively August 2008 to March 2009 and July 2017 and March 2018.

5 Results

5.1 CSR and returns in period 2008/2009

5.1.1 Net CSR score and returns

In Table IVa and Table IVb, the results for the first linear regression models are shown. First, the influence of net CSR on returns, as seen in Equation 1 is calculated on the raw as well as the abnormal returns, as shown in model (1) and (2). Here, the positive significance on the 1% level of *CSR* on *Raw return* draws attention. This is similar to the result of these models in Lins et al., (2017), with a value for *CSR* of 0.059 in their model (1), except the difference in the intercept, which is -0.588 in the Lins et al., (2017) paper. This disparity could be explained by the different number of observations and the exception of the Fama & French four-factor loadings. The difference in outcome for *CSR* on *Abnormal return* is remarkable, with an influence of 6,2% opposite to 10,9% by Lins et al., (2017). This could be explained by a different calculation method used, when estimating the abnormal returns. The intercept differs also with a value of -0.781 found by Lins et al., (2017).

Next, the control variables are added, as seen in Equation 2, shown in model (3) and (4). Here, the significant effect of the CSR score of model (1) and (2) is marginally reduced, in contrast to Lins et al., (2017), yet stays significant on the respectively 5% and 10% level. For long-term debt, Lins et al., (2017) find a significant negative effect in model (3), but insignificant negative effect in model (4), while here both models produce a significant negative effect on the respectively 10% and 5% level. This matches the prediction in the first hypothesis. However, with the short-term debt variable, as well as cash holdings, they find a significant effect, whereas this model results insignificantly.

For *Profitability* and *Book-to-market ratio*, model (3) in Lins et al., (2017) results a significant effect, while model (4) results an insignificant effect. Here, *Profitability* yields a larger, positive and significant effect in both models, whereas *Book-to-market ratio* yields no significant effect in either model.

Furthermore, the large positive influence of the idiosyncratic risk variable stands out in the Lins et al., (2017) paper, with a value of -3.155 and -8.870 in model (3) and (4), respectively. While the model in this paper also reports a significant influence, the values of respectively 0.252 and 0.264 are considerably more limited and positive. This contradicts Hypothesis 1b, meaning that this outcome has no economically funded explanation. Aforementioned can be explained by a possible other method of calculating the idiosyncratic risk, which is obtained as the error term of the CAPM model for constructing the abnormal return. The used CAPM model to attain abnormal returns might be another approach than the ambiguous described market model-adjusted returns used by Lins et al., (2017), therefore yielding another outcome for the Idiosyncratic risk variable.

Next to this, the significance of the negative influence of the momentum variable in model (3) stands out, while Lins et al., (2017) report no significant effect. This corresponds to the predic-

tion made in Hypothesis 1b, forecasting a negative relationship between momentum and the return variables.

The dummy for a negative Book-to-market ratio is not significantly different from zero, comparable to the outcome in Lins et al., (2017). Moreover, it is interesting to see that the added dummy for U.S. companies yields a significant effect on the 10% level, meaning that domestic companies earn significantly more than foreign companies, during the crisis period in the U.S.

Moreover, the significance of the intercept holds in all models, equal to Lins et al., (2017). Yet, is is remarkable that Lins et al., (2017) report a significant positive intercept of 0.0867 in model (4), while all other intercepts are largely negative. In this model, the intercept reports a significant value of -0.469.

The adjusted R^2 differs somewhat from the reported numbers in Lins et al., (2017), which is higher in model (1) and (3), but lower in model (2) and (4). This implies that the models (2) and (4) explain fewer variation in the sample of abnormal returns, and therefore lack the comparable explanatory power. This could probably be attributed to the different effect of the *CSR* on *Abnormal return*, due to the alternate calculation method. Finally, this paper only includes industry fixed effects while Lins et al., (2017) also includes the four-factor loadings as explained previously in section 3. This could also explain the discrepancy in explanatory power of these models.

In Table IVb, dummies for each separate industry are added to examine industry specific effects. This is one of the extensions this paper adds next to the Lins et al., (2017) replication. The classification of the codes per division can be found in Appendix A.2. The dummy for the sector Agriculture will be left out of the equation, to avoid collinearity, whereas its effect will be included in the intercept. The earlier mentioned industry fixed effects will be left out of these models, because of their interaction with the industry dummy variables. Firstly, the dummies will be added without the supplementary control variables in model (5) and (6), whereafter they will be studied collectively in model (7) and (8). What draws attention immediately are the significant negative influence of all industry dummies in model (5) and (6). The largest influence on both raw and abnormal returns can be attributed to the Mining division, which means that this industry was affected most during this particular crisis period. Additionally, *CSR* is significantly positive, similar to with the first models (1)–(4). However, this influence is slightly smaller than before. The value of the intercepts is slightly higher than the earlier calculated constants. Nevertheless, the adjusted R^2 of both models is more than halved, presumably because of the omitted within-industry fixed effects.

The significant influence of *CSR* diminishes when the other independent variables are added to the equation. The significance of the industry dummies stays intact for almost all variables, except for *Dummy Construction* in model (7). The significance level declines for *Dummy Construction* in model (8), even as *Dummy Retail* in model (7) and (8), compared with model (5) and (6). This implicates that Hypothesis 1a can only be partially accepted.

It is remarkable nonetheless, that all values for these dummies decrease with the addition of the auxiliary variables, confirming a small omitted variable bias in models (5) and (6). In comparison with models (3) and (4), a significant positive value for *Ln(Market capitalization)* stands out, consistent with Hypothesis 1b. The *Long-term debt* variable yields a larger negative and more significant influence, yet *Profitability* loses its significant influence. The value of *Book-to-market ratio* also increases, resulting significant at the 1% level, while *Momentum* decreases in influence in model (7), but stays significant at the 10% level. This also corresponds to the predictions made in Section 3.3.

Idiosyncratic risk remains it's positive illogical influence, whereas the dummy for U.S. based companies yields more significance. Again, the intercepts are higher than the previous models, holding their significance. The adjusted R^2 increases with the added control variables, yet stays at almost half of the adjusted R^2 in the respective models (3) and (4).

With Tables IVa and IVb, one element of the answer on the first hypothesis can be derived. Net CSR yields a significant effect on Raw return as well as Abnormal return, in all models without control variables. This accepts the first sub-hypothesis of Hypothesis 1, predicting a higher valuation from shareholders during the trust shock in 2008 for more trustworthy firms. The models including control variables yield a significant effect in models (3) and (4), but an insignificant effect in model (7) and (8). This partially accepts the second sub-hypothesis, which predicts a better financial health for more trustworthy firms, to withstand the effects of said trust shock.

5.1.2 Quartiles of net CSR score and returns

To continue the Lins et al., (2017) research, the CSR score will be divided in quartiles, where a dummy for each quartile will be added to all four models. The first quartile will be left aside of the equation, to avoid collinearity and capture this effect in the constant. The outcome of this model is shown in Table V. Resembling the Lins et al., (2017) paper, the significant influence on the 1% level of the fourth quartile of the CSR score is shown in model (1) and (2). Yet, their values differ, with 0.070 and 0.076 in these models, regarding to respectively 0.0552 and 0.0985 in Lins et al., (2017).

The other quartiles yield no significant influence, whereas Lins et al., (2017) find a significant influence on the 10% level for *CSR3*. The intercept holds its significance and is slightly higher than the intercept in Table IVa. This number cannot be compared to Lins et al., (2017), because they do not report their intercepts for this model. Again, the adjusted R^2 is higher for model (1) than Lins et al., (2017), while in model (2) it is much lower. The same arguments as in Table IVa underpin this difference.

Despite the relatively low significance, the influence of the fourth CSR quartile in model (3) remains significant at the 10% level and larger than the overall CSR influence of 0.040 in Table IVa. None of the quartiles yield a significant influence in the fourth model. These findings contradict Lins et al., (2017), who find a significant influence on the 5% level for *CSR3* in model (3) and *CSR4* in

Table IVa: Net CSR Score: Raw and Abnormal Returns of Part I

	Raw Return (1)	Abnormal Return (2)	Raw Return (3)	Abnormal Return (4)
CSR	0.058***	0.062***	0.040**	0.039*
	(0.018)	(0.018)	(0.020)	(0.021)
Ln(Market cap.)			0.011	0.014
			(0.009)	(0.009)
Long-term debt			−0.124*	−0.137**
			(0.064)	(0.066)
Short-term debt			−0.196	0.155
			(0.204)	(0.212)
Cash holdings			0.029	−0.016
			(0.090)	(0.092)
Profitability			0.760**	0.931**
			(0.357)	(0.363)
B/M ratio			−0.070	−0.055
			(0.043)	(0.044)
Momentum			−0.078**	−0.054
			(0.033)	(0.033)
Idiosyncratic risk			0.252***	0.264***
			(0.094)	(0.095)
Dummy -/- B/M ratio			−0.071	−0.060
			(0.089)	(0.093)
Dummy U.S.			0.036*	0.036*
			(0.021)	(0.021)
Constant	−0.223***	−0.302***	−0.365***	−0.469***
	(0.013)	(0.014)	(0.088)	(0.090)
Industry dummies	Yes	Yes	Yes	Yes
N	1,109	1,109	1,109	1,109
Adjusted R^2	0.180	0.197	0.222	0.242

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

model (3) even as model (4). The control variables yield almost exactly the same significance on similar values for *Raw return* as well as *Abnormal return*, which is presumably because of the same data input. Nevertheless the values differ slightly from Table IVa. Next to this, *Momentum* yields a significant influence in model (4) on the 10% level and *Dummy U.S.* yields still a significant influence on the same level for both models. The intercepts are analogous to the results of model (1) and (2), namely marginally higher than in Table IVa and significant on the 1% level. The R^2 are likewise resembling model (1) and (2) of this table, and Table IVa. The similar outcomes for the explanatory as well as control variables imply a partial acceptance for the first hypothesis, consistent with the preceding tables.

Table IVb: Net CSR Score: Raw and Abnormal Returns of Part I (continued)

	Raw Return (5)	Abnormal Return (6)	Raw Return (7)	Abnormal Return (8)
CSR	0.041***	0.045***	0.020	0.021
	(0.013)	(0.014)	(0.013)	(0.014)
Dummy Mining	−0.346***	−0.364***	−0.241***	−0.270***
	(0.031)	(0.031)	(0.042)	(0.042)
Dummy Construction	−0.126***	−0.165***	−0.071	−0.109*
	(0.042)	(0.044)	(0.053)	(0.056)
Dummy Manufacturing	−0.193***	−0.221***	−0.171***	−0.201***
	(0.013)	(0.013)	(0.023)	(0.024)
Dummy Transport.	−0.131***	−0.133***	−0.074***	−0.083***
	(0.023)	(0.023)	(0.027)	(0.027)
Dummy Wholesale	−0.180***	−0.203***	−0.148***	−0.177***
	(0.032)	(0.033)	(0.035)	(0.036)
Dummy Retail	−0.080***	−0.101***	−0.054*	−0.077**
	(0.029)	(0.030)	(0.030)	(0.031)
Dummy Services	−0.166***	−0.193***	−0.135***	−0.161***
	(0.019)	(0.019)	(0.026)	(0.027)
Ln(Market cap.)			0.019***	0.023***
			(0.006)	(0.006)
Long-term debt			−0.200***	−0.200***
			(0.047)	(0.048)
Short-term debt			−0.060	−0.026
			(0.131)	(0.136)
Cash holdings			0.012	−0.039
			(0.062)	(0.063)
Profitability			0.213	0.298
			(0.260)	(0.265)
B/M ratio			−0.101***	−0.088***
			(0.030)	(0.031)
Momentum			−0.042*	−0.018
			(0.023)	(0.024)
Idiosyncratic risk			0.320***	0.361***
			(0.066)	(0.067)
Dummy -/- B/M			0.007	0.013
			(0.064)	(0.065)
Dummy U.S.			0.043***	0.043***
			(0.016)	(0.016)
Constant	−0.236***	−0.314***	−0.389***	−0.500***
	(0.010)	(0.010)	(0.059)	(0.061)
N	1,109	1,109	1,109	1,109
Adjusted R^2	0.051	0.053	0.127	0.134

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero. The dummy for the Agriculture division is left out of the estimation, to avoid collinearity. A table with corresponding SIC codes and a more extensive description of each division can be found in Appendix A.3.

Table V: Dummies for quartiles of net CSR Score: Raw and Abnormal Returns of Part I

	Raw Return (1)	Abnormal Return (2)	Raw Return (3)	Abnormal Return (4)
CSR2	0.014	0.011	0.004	0.000
	(0.027)	(0.030)	(0.027)	(0.028)
CSR3	0.018	0.018	0.016	0.016
	(0.024)	(0.029)	(0.023)	(0.024)
CSR4	0.070***	0.076***	0.049*	0.047
	(0.026)	(0.029)	(0.029)	(0.029)
Ln(Market cap.)			0.011	0.014
			(0.009)	(0.009)
Long-term debt			−0.125*	−0.138**
			(0.065)	(0.067)
Short-term debt			−0.201	−0.161
			(0.203)	(0.211)
Cash holdings			0.028	−0.017
			(0.090)	(0.092)
Profitability			0.761**	0.933**
			(0.355)	(0.362)
B/M ratio			−0.073*	−0.058
			(0.043)	(0.044)
Momentum			−0.081**	−0.058*
			(0.033)	(0.034)
Idiosyncratic risk			0.248***	0.260***
			(0.095)	(0.096)
Dummy -/- B/M			−0.068	−0.058
			(0.089)	(0.093)
Dummy U.S.			0.038*	0.037*
			(0.021)	(0.021)
Constant	−0.266***	−0.348***	−0.396***	−0.500***
	(0.000)	(0.000)	(0.084)	(0.086)
Industry dummies	Yes	Yes	Yes	Yes
N	1,109	1,109	1,109	1,109
Adjusted R^2	0.176	0.194	0.219	0.239

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The heteroscedasticity-consistent standard errors are reported in parentheses, with *, ** and *** as indication for a respectively 10%, 5% and 1% level of significance.

5.1.3 Separate CSR categories and returns

Next, the specific influence of each CSR category on the raw and abnormal returns will be considered. The results for this model can be found in Table VI. It is noteworthy that the 1% level of significance of the Net CSR variable in Table IVa diminishes when dividing this variable in its initial categories. Nevertheless, *Diversity* keeps its significant influence on the 10% and 5% level in respectively model (1) and (2), similar to *Employee relations*. In these two models, the intercepts show a limited decrease regarding Table IVa, as well as the R^2. In model (3) and (4), all information disperses as the control variables are added, except for the Human Rights category, which remains significant on the 10%

level with a substantial value. The influence of the control variables persists roughly, with a difference in significance for *Market capitalization*, *Book-to-market ratio* and *Dummy U.S.*. The intercepts in model (3) and (4) are marginally higher compared to Table IVa, while the adjusted R^2 coefficients remain almost identical. This results implicate also a partial acceptance of H1a and H1b.

Table VI: Net CSR Categories: Raw and Abnormal Returns of Part I

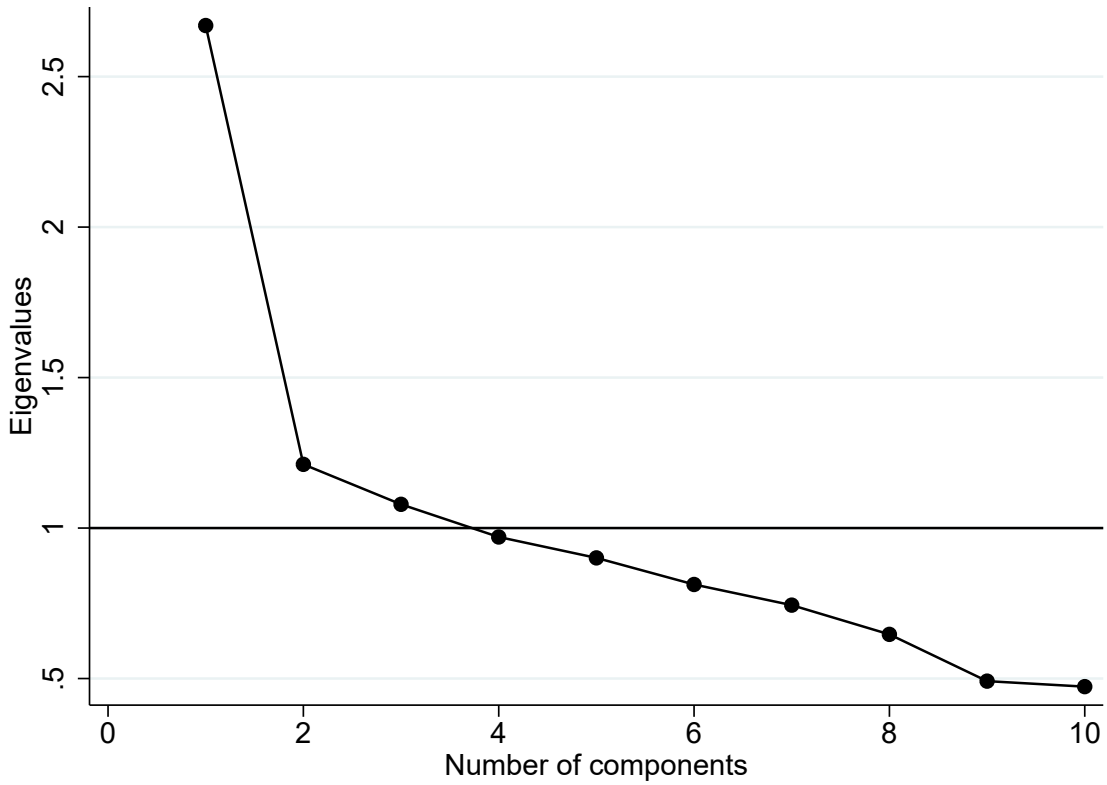
	Raw Return (1)	Abnormal Return (2)	Raw Return (3)	Abnormal Return (4)
Community	−0.033	−0.039	−0.050	−0.064
	(0.081)	(0.082)	(0.079)	(0.079)
Diversity	0.053*	0.059**	0.027	0.025
	(0.029)	(0.029)	(0.031)	(0.031)
Employee relations	0.083*	0.089**	0.055	0.057
	(0.043)	(0.044)	(0.043)	(0.044)
Environment	0.075	0.074	0.083	0.082
	(0.075)	(0.077)	(0.071)	(0.073)
Human Rights	0.105	0.106	0.126	0.141*
	(0.089)	(0.090)	(0.081)	(0.083)
Ln(Market cap.)			0.013	0.017*
			(0.009)	(0.009)
Long-term debt			−0.119*	−0.132**
			(0.064)	(0.066)
Short-term debt			−0.185	−0.142
			(0.206)	(0.214)
Cash holdings			0.031	−0.014
			(0.090)	(0.092)
Profitability			0.780**	0.953**
			(0.360)	(0.366)
B/M ratio			−0.066	−0.051
			(0.043)	(0.044)
Momentum			−0.075**	−0.051
			(0.033)	(0.034)
Idiosyncratic risk			0.258***	0.270***
			(0.094)	(0.096)
Dummy -/- B/M			−0.072	−0.061
			(0.090)	(0.094)
Dummy U.S.			0.036*	0.036*
			(0.021)	(0.021)
Constant	−0.219***	−0.296***	−0.390***	−0.496***
	(0.016)	(0.017)	(0.092)	(0.094)
Ind. dum	Yes	Yes	Yes	Yes
N	1,109	1,109	1,109	1,109
Adjusted R^2	0.178	0.196	0.221	0.242

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

5.1.4 CSR components and returns

Furthermore, the Principal Component Analysis (PCA) will be used to determine new variables which might yield more explanatory value than the earlier splitted categories. The calculated components with their corresponding eigenvalues are graphically displayed in Figure 3. A table with the numerical outcomes of the eigenvalues can be found in Appendix A.3. As mentioned in Section 3.1.2, the number of components to retain are depending on the so-called 'elbow curve' in the scree plot. However, the cut-off point remains unclear to determine because of an indefinite elbow curve. This leaves the possibility to retain two or three components to continue. The earlier explained Kaiser rule demands to discard all components with an eigenvalue below one. As seen in Figure 3, the third component still holds an eigenvalue above one. Therefore, this component will be included in the regression model to examine the influence on the returns.

Figure 3: Scree plot with eigenvalues from Principal Component Analysis



Note: This figure displays a scree plot with eigenvalues obtained with the Principal Component Analysis. A table with numerical outcomes for all eigenvalues can be found in Appendix A.3. The complementing eigenvectors can be found in Table VII.

Moreover, the components obtained with the PCA will be examined. In Table VII the eigenvectors per principal component are displayed, to clarify possible structures in the underlying data. This shows that the Strengths scores in the categories Community, Diversity, Employee relations and

Environment are strongly represented in PC_1. Also the Weaknesses scores for these categories, except for Community, obtain a high representation rate within PC_2. Human Rights Strengths and Weaknesses scores are not that well represented in these two principal components, but have therefore high eigenvectors in PC_3, with only *Diversity Weaknesses* adjoining. Accordingly, the representation of all categories can be confirmed in this table.

Table VII: Eigenvectors Principal Component Analysis of Part I

	PC_1	PC_2	PC_3	Unexplained
Community Strengths	0.400	−0.268	0.087	0.478
Community Weaknesses	0.283	0.334	−0.002	0.652
Diversity Strengths	0.413	−0.371	−0.061	0.373
Diversity Weaknesses	−0.140	0.383	0.364	0.628
Employee relations Strengths	0.378	−0.104	−0.250	0.538
Employee relations Weaknesses	0.198	0.419	0.074	0.677
Environment Strengths	0.389	0.013	−0.231	0.537
Environment Weaknesses	0.340	0.514	−0.155	0.345
Human Rights Strengths	0.165	−0.258	0.681	0.346
Human Rights Weaknesses	0.305	0.127	0.497	0.466
N	2,963			

Note: These eigenvectors are a result from the Principal Component Analysis and are complementing the eigenvalues in Appendix A.3 and the scree plot in Figure 4.

Subsequently, the obtained components will be used in the regression model, to examine their influence on the returns. The results can be found in Table VIII. Model (1) and (2) in this table show the exclusive influence on returns without the control variables, and show a positive significant influence for the first principal component on the respective 10% and 5% significance level. PC_2 yields a negative significant influence on the 5% level in both models. PC_3 results no significant effect. This implies a positive influence for the Community, Diversity, Employee relations and Environment Strengths, next to a large negative influence of Diversity, Employee relations and Environment Weaknesses. This outcome is consistent with the predictions of Hypothesis 1a. The intercept holds its significance with a higher value compared to Table IVa, the adjusted R^2 coefficients are marginally lower compared to Table IVa.

The influence of the first component discontinues with the inclusion of the control variables in model (3) and (4). Yet, the influence of PC_2 holds, even as the significance of the control variables. This confirms the first sub-hypothesis, and partially confirms the second sub-hypothesis. Resembling the first two models, the constant holds its significance and results relatively high regarding Table IVa. The adjusted R^2 coefficients remain nearly unchanged.

Table VIII: Principal Components of CSR Score: Raw and Abnormal Returns of Part I

	Raw Return (1)	Abnormal Return (2)	Raw Return (3)	Abnormal Return (4)
PC_1	0.009*	0.010**	−0.002	−0.004
	(0.005)	(0.005)	(0.006)	(0.007)
PC_2	−0.022**	−0.023**	−0.020**	−0.020**
	(0.010)	(0.010)	(0.010)	(0.010)
PC_3	−0.004	−0.005	−0.004	−0.004
	(0.006)	(0.006)	(0.006)	(0.006)
Ln(Market cap.)			0.016	0.021**
			(0.010)	(0.010)
Long-term debt			−0.128**	−0.143**
			(0.064)	(0.066)
Short-term debt			−0.180	−0.137
			(0.204)	(0.213)
Cash holdings			0.030	−0.015
			(0.090)	(0.092)
Profitability			0.744**	0.912**
			(0.359)	(0.364)
B/M ratio			−0.066	−0.051
			(0.043)	(0.044)
Momentum			−0.077**	−0.053
			(0.033)	(0.033)
Idiosyncratic risk			0.257***	0.270***
			(0.093)	(0.095)
Dummy -/- B/M ratio			−0.067	−0.055
			(0.088)	(0.091)
Dummy U.S.			0.036*	0.035*
			(0.021)	(0.021)
Constant	−0.239***	−0.318***	−0.423***	−0.538***
	(0.009)	(0.009)	(0.095)	(0.097)
Industry dummies	Yes	Yes	Yes	Yes
N	1,109	1,109	1,109	1,109
Adjusted R^2	0.177	0.195	0.2212	0.242

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

5.2 CSR and returns in period 2018/2019

5.2.1 Net CSR score and returns

After the examination of the influence of CSR scores on return during the financial crisis, this research will be extended with a second time period facing a recent moment of decline in trust. This study will be performed to confirm the external validity of the Lins et al., (2017) paper by analyzing the effects outside the financial crisis. Lins et al., (2017) have extended their research with the Enron/Worldcom fraud scandals and reported a positive influence of a non-negative CSR score on returns during the period October 2001 to March 2003. To compare the results of this paper with

Lins et al., (2017), an indicator for a positive CSR will be included in the regression model. All control variables will remain, next to the industry dummies.

The results for this model can be found in Table IX. The first thing that draws attention are the relative equal number of observations in the current model, comparing to 1,110 in the earlier models, and 412 in the examined time period by Lins et al., (2017). The models (1) and (2) take the original Net CSR score into account, which result in no significant effect, a similar outcome to the Lins et al., (2017) paper. This is why they include a positive CSR dummy, referring to the relatively large influence of the fourth quartile of CSR score in table V. In this model, the *CSR >0 indicator* yields no significant effect, in contrast with Lins et al., (2017) who report a significant effect for this variable at the respectively 10% and 5% level during the Enron/Worldcom trust crisis. This rejects the first sub-hypothesis. Remarkable are the absence of almost all significant influence, regarding the first research period. Merely the *Long-term debt* variable reports a significant influence, nevertheless this yields a positive influence, which cannot be economically validated. This implicates that the second sub-hypothesis will be rejected as well. Yet, it is interesting to see that the newly introduced U.S. dummy remains its significance at the 10% level. The intercept coefficients yield no significant effect in model (1) nor (2), while Lins et al., (2017) report large significant effects for these two intercepts, contrasting an insignificance result in model (3) and (4). Lastly, the adjusted R^2 of Lins et al., (2017) is a lot higher than the adjusted R^2 in this table, which might also be pointing to a different effect of CSR on the returns. However, questions can be raised on the validity of the results of Lins et al., (2017), regarding the number of observations supporting this outcome.

Table IX: Net CSR Score: Raw and Abnormal Returns of Part II

	Raw Return (1)	Abnormal Return (2)	Raw Return (3)	Abnormal Return (4)
CSR	0.014	0.016		
	(0.019)	(0.019)		
CSR > 0 indicator			−0.003	−0.002
			(0.024)	(0.025)
Ln(Market cap.)	−0.001	−0.004	0.003	0.001
	(0.011)	(0.011)	(0.010)	(0.010)
Long-term debt	0.186*	0.208**	0.184*	0.206**
	(0.096)	(0.098)	(0.096)	(0.098)
Short-term debt	0.257	0.259	0.267	0.269
	(0.203)	(0.203)	(0.203)	(0.202)
Cash holdings	0.189	0.200	0.191	0.203
	(0.132)	(0.131)	(0.132)	(0.131)
Profitability	−0.632	−0.763	−0.642	−0.774
	(0.583)	(0.583)	(0.585)	(0.585)
B/M ratio	−0.054	−0.047	−0.051	−0.044
	(0.058)	(0.059)	(0.058)	(0.059)
Momentum	0.043	0.050	0.043	0.049
	(0.048)	(0.048)	(0.048)	(0.048)
Idiosyncratic risk	0.013	0.008	0.012	0.006
	(0.217)	(0.221)	(0.217)	(0.221)
Dummy -/- B/M	−0.124	−0.121	−0.120	−0.117
	(0.090)	(0.091)	(0.089)	(0.090)
Dummy U.S. firm	0.050*	0.052*	0.049*	0.051*
	(0.027)	(0.028)	(0.027)	(0.028)
Constant	0.106	0.128	0.070	0.090
	(0.104)	(0.106)	(0.096)	(0.098)
Industry dummies	Yes	Yes	Yes	Yes
N	1,266	1,266	1,266	1,266
Adjusted R^2	0.069	0.074	0.068	0.073

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

5.3 Comparing the two time periods

5.3.1 Difference-in-differences model

Next, both time periods will be combined and studied with a Difference-in-Differences (DiD) model. This model is varying from a classic DiD, because there is no 'control' group without 'treatment' of both crises. Therefore, continuous treatment is assumed, and only the interaction with CSR within and outside of the crisis periods are examined. First, the effect of CSR on returns in the aggregated crisis periods is viewed, whereafter these periods will be considered individually. Furthermore, the drivers of excess returns will be studied by looking at different measures of operating performance and capital raising capabilities.

To start, Table X shows the interaction of CSR with a crisis and post–crisis dummy. All earlier control variables as well as firm and time fixed effects are included. It is interesting to see no significant effect of *CSR* × *Crisis* in both raw and abnormal return models, while Lins et al., (2017) report a significant influence in both models. Furthermore, Lins et al., (2017) report no significant influence for the *CSR* × *Post–crisis* variable, while Table X reports a negative value significant on the 5% level. This result means that firms receive a lower valuation by shareholders outside of the crisis periods, which is opposite to the expectations. This means that the first sub-hypothesis of Hypothesis 3 cannot be accepted. Nevertheless, the intercepts yield a significant effect, which Lins et al., (2017) have not reported. The difference for this value between model (1) and (2) is however remarkable, presumably because of the different calculation of Abnormal Returns. The number of observations is 50% higher than in Lins et al., (2017), which could also play a role in the different outcome. The adjusted R^2 coefficients are fairly low with respective values of 0.060 and 0.016, regarding respectively 0.29 and 0.06 reported by Lins et al., (2017). This confirms the low explanatory value of the data, despite the high number of observations.

Table X: Returns surrounding both crisis periods and CSR of Part III

	Raw Return (1)	Abnormal Return (2)
CSR × Crisis	−0.002	0.009
	(0.001)	(0.061)
CSR × Post–crisis	−0.002**	0.041
	(0.001)	(0.047)
Constant	0.020***	2.413***
	(0.005)	(0.349)
Firm characteristics	Yes	Yes
Time (monthly) fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
Standard errors clustered by	Firm	Firm
N	186,815	186,815
Adjusted R^2	0.060	0.016

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

The aggregation of both crises in this table disturbs possible influence from the crisis separately. Therefore these crises are studied individually in Table XI, referring to $Crisis_1$ as the (financial) trust crisis studied in Part I of this paper, and $Crisis_2$ as the more recent trust crisis studied in Part II. Here, we see a positive significant influence for *CSR* × $crisis_1$ and *CSR* × $Post–crisis_1$ as well as a strongly significant negative influence for *CSR* × $crisis_2$ and *CSR* × $Post–crisis_2$ on raw return. Regarding the abnormal returns, only *CSR* × $Post–crisis_2$ yields a significant positive effect. This confirms the prediction that the aggregated variables of both crises disturb the actual effect. Next to

this, it endorses the earlier outcome about the first crisis, where CSR positively attributes to a higher firm valuation, yet with a marginally higher outcome during opposed to after the crisis period. This implicates the partially acceptance of Hypothesis 3a. Nevertheless, the second crisis yields again a reverse effect on raw return, both during and after the crisis period, with even a marginally more negative effect during the crisis. This implies a rejection of Hypothesis 3a. The values of the constant variables remain nearly unchanged, the adjusted R^2 remains unchanged.

Table XI: Returns surrounding both separated crisis periods and CSR of Part III

	Raw Return (1)	Abnormal Return (2)	Raw Return (3)	Abnormal Return (4)
CSR × Crisis_1	0.007^{*}	-0.036		
	(0.004)	(0.100)		
CSR × Post–crisis_1	0.003^{**}	0.022		
	(0.001)	(0.080)		
CSR × Crisis_2			-0.003^{***}	0.008
			(0.001)	(0.058)
CSR × Post–crisis_2			-0.002^{***}	0.028^{*}
			(0.001)	(0.037)
Constant	0.020^{***}	2.401^{***}	0.019^{***}	2.417^{***}
	(0.005)	(0.348)	(0.005)	(0.351)
Firm characteristics	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm	Firm
N	186,815	186,815	186,815	186,815
Adjusted R^2	0.060	0.016	0.060	0.016

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

Next the aggregated and separated crisis periods are interacted with a separated CSR variable, resembling the Lins et al., (2017) research. The CSR variable will be divided in an internal as well as an external stakeholder variable. These variables consider respectively the categories Employee Relations and Diversity, as the categories Community, Human Rights and Environment. These variables will examine from which improvements in a firms social capital, trust will be derived most by its stakeholders. In Table XII the splitted CSR variable is interacted with the aggregated crisis and post–crisis variable, to examine their influence on the raw and abnormal return. The non-significant influence of internal stakeholder CSR compared to the significant influence of external stakeholder CSR draws attention. This contradicts Lins et al., (2017), who find significant results for both stakeholders. Moreover, these variables yield a negative influence on raw return, while resulting a positive influence on abnormal return. The interaction with the crisis and post–crisis dummies yield no considerable difference within the external stakeholders trust.

Table XII: Returns surrounding both crisis periods and separated internal and external stakeholder CSR of Part III

	Raw Return (1)	Abnormal Return (2)
Internal stakeholder CSR x Crisis	−0.001	−0.119
	(0.002)	(0.077)
Internal stakeholder CSR x Post-crisis	−0.001	−0.071
	(0.001)	(0.059)
External stakeholder CSR x Crisis	−0.006*	0.245*
	(0.003)	(0.145)
External stakeholder CSR x Post-crisis	−0.004**	0.222**
	(0.002)	(0.094)
Constant	0.020***	2.427***
	(0.005)	(0.347)
Firm characteristics	Yes	Yes
Time (monthly) fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
Standard errors clustered by	Firm	Firm
N	186,815	186,815
Adj, R^2	0.060	0.017

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

Furthermore, in Table XIII the separated CSR variables interacting with the separated crisis periods are displayed. Here, a more clear distinction can be made between the effects of both crises. As for the first crisis period, only the internal stakeholder CSR yields a significant influence during the crisis, whereas external stakeholder CSR results significant post–crisis. However, these effects occur only in model (1). Regarding the second trust crisis, Internal stakeholder CSR yields a negative significant influence on raw as well as abnormal returns, whereas external stakeholder CSR results a positive significant influence on abnormal returns. Next to this, *External stakeholder CSR* × *Post–crisis*$_2$ results a strong negative influence on raw returns, and a positive influence on abnormal returns. This implies that investors view an internal stakeholder focus as beneficial during the first crisis, and disadvantageous during the second crisis. A similar outcome can be projected onto an external stakeholder focus after the first and second crisis. This contributes to the partial acceptance of Hypothesis 3a. The other interacting variables yield no significant result, while the constants stay significant and resemble Table XII. The adjusted R^2 coefficients remains nearly identical.

5.3.2 Drivers of excess returns by CSR

Next, the drivers behind the higher returns by CSR will be examined, by studying different performance measures, employment growth and capital raising abilities for each firm. First, the performance measures will be studied for the aggregated crisis periods, whereafter they are studied

Table XIII: Returns surrounding both separated crisis periods and separated internal and external stakeholder CSR of Part III

	Raw Return (1)	Abnormal Return (2)	Raw Return (3)	Abnormal Return (4)
Int. CSR × Crisis_1	0.010^{**}	-0.078		
	(0.005)	(0.135)		
Int. CSR × Post-crisis_1	0.002	-0.098		
	(0.001)	(0.108)		
Ext. CSR × Crisis_1	-0.012	-0.002		
	(0.008)	(0.167)		
Ext. × Post-crisis_1	0.008^{***}	0.210		
	(0.003)	(0.145)		
Int. CSR × Crisis_2			-0.005^{***}	-0.154^{*}
			(0.002)	(0.081)
Int. CSR × Post-crisis_2			0.000	-0.067
			(0.001)	(0.055)
Ext. CSR × Crisis_2			-0.001	0.308^{*}
			(0.003)	(0.146)
Ext. CSR × Post-crisis_2			-0.007^{***}	0.181^{*}
			(0.002)	(0.098)
Constant	0.019^{***}	2.393^{***}	0.018^{***}	2.443^{***}
	(0.005)	(0.349)	(0.005)	(0.351)
Firm characteristics	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm	Firm
N	186,815	186,815	186,815	186,815
Adjusted R^2	0.061	0.016	0.061	0.017

Note: The explanatory variables and the control variable are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

separately again. The measures that will be used are Profitability[5] (1), Gross margin (2), Sales growth (3), Accounts receivable divided by sales (4) and Sales per employee (5). For all performance measure models, *Ln(Assets)* will be used as control variable, resembling Lins et al., (2017).

In Table XIVa the first results of this model are shown for the first four performance measures regarding the aggregated crisis periods. What draws immediate attention are the non-significant values of the CSR interaction variables, as well as the low adjusted R^2. Only the control variable in model (1a), (2a) and (3a) as well as the intercept in model (1a) yield a significant result. This outcome of a negative relationship between *Ln(Assets)* and *Profitability*, contrasting a positive relationship between *Ln(Assets)* and both *Gross margin* and *Sales growth* is logically justifiable.

Comparing these outcomes with the values in Table XIVb, the separation of crisis periods yields no significant effect for any of the variables *Profitability* and *Gross margin*. Nevertheless, the control

[5] This variable is named 'Operating return on assets' by Lins et al., (2017), but will keep the name 'Profitability' here to avoid difficulties as well as maintaining consistence throughout this paper.

variable holds its significance, next to the intercept for the dependent variable *Profitability*. This result is largely inconsistent with Lins et al., (2017), who find a significant influence during and after the crisis for the first three variables. They only report an insignificant outcome for *Accounts receivable divided by Sales*. This results in a rejection of the second sub-hypothesis.

The individual approach of both crisis periods regarding the variables *Sales growth* and *Accounts receivable divided by assets* can be found in Table XIVc. Here as well, the first crisis period yields no significant effect interacting CSR score.

However, the second crisis period yields a significant negative effect during the crisis *Accounts receivable divided by assets*. This is interesting because of the insignificant value in the aggregated crisis period models in Table XIVa and in the Lins et al., (2017) results. This can be attributed to a small omitted variable bias in the fist table. The negative relationship with CSR during the second crisis period implies a larger access to cash as well as more ability to attract debt, thus can be considered as a favourable outcome. This partially accepts the second sub-hypothesis. Next to this, the intercept holds significance on the 10% level for this last variable in both crisis periods, while the adjusted R^2 stays low.

Lastly, the results for *Sales per employee* can be found in Table XIVd. Here, a strong significant influence is found in model (5a), where further exploration attributes this influence to the second crisis period in model (5c). The aggregated post–crisis period yields a less strong significant effect, which also refers to crisis_2. In Lins et al., (2017) this variable reports a strong significant effect both during and after the crisis period, with the post–crisis value approximately half the size of the during crisis value. This is similar to the outcome in this table, which leads to a partial acceptance of Hypothesis 3b. Again, the control variable yields a significant influence. The adjusted R^2 values are slightly higher than in previous models, however they remain below the numbers reported by Lins et al., (2017).

Table XIVa: Operating performance variables surrounding both crisis periods and CSR of Part III

	Profitability (in %) (1a)	Growth margin (in %) (2a)	Sales growth (in %) (3a)	Accounts Receivable / Sales (in %) (4a)
CSR × Crisis	0.001	−0.006	0.005	−0.012
	(0.001)	(0.009)	(0.007)	(0.025)
CSR × Post–crisis	0.000	−0.011	−0.003	0.000
	(0.001)	(0.009)	(0.005)	(0.021)
Ln(Assets)	−0.003***	0.062***	0.012*	−0.006
	(0.001)	(0.016)	(0.007)	(0.055)
Constant	0.053***	−0.130	−0.043	0.019
	(0.008)	(0.122)	(0.053)	(0.417)
Time fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm	Firm
N	186,815	186,356	186,064	174,515
Adj, R^2	0.003	0.008	0.001	0.000

Note: The explanatory variables and the control variable are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroskedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

Table XIVb: Operating performance variables surrounding both individual crisis periods and CSR of Part III

	Profitability (in %) (1b)	Growth margin (in %) (2b)	Profitability (in %) (1c)	Growth margin (in %) (2c)
CSR × Crisis_1	−0.001	0.000		
	(0.002)	(0.011)		
CSR × Post–crisis_1	0.002	0.004		
	(0.001)	(0.008)		
CSR × Crisis_2			0.001	−0.002
			(0.001)	(0.008)
CSR × Post–crisis_2			−0.000	−0.011
			(0.001)	(0.008)
Ln(Assets)	−0.003***	0.062***	−0.003***	0.063***
	(0.001)	(0.016)	(0.001)	(0.016)
Constant	0.053***	−0.129	0.053***	−0.133
	(0.008)	(0.123)	(0.008)	(0.123)
Time fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm	Firm
N	186,815	186,356	186,815	186,356
Adjusted R^2	0.003	0.008	0.003	0.008

Note: The explanatory variables and the control variable are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

Table XIVc: Operating performance variables surrounding both individual crisis periods and CSR of Part III (continued)

	Sales growth (in %) (3b)	Acc. Receivable / Sales (in %) (4b)	Sales growth (in %) (3c)	Acc. Receivable / Sales (in %) (4c)
CSR × Crisis_1	0.001	0.008		
	(0.011)	(0.009)		
CSR × Post–crisis_1	0.012	−0.001		
	(0.008)	(0.006)		
CSR × Crisis_2			0.009	−0.008**
			(0.006)	(0.004)
CSR × Post–crisis_2			−0.007	0.003
			(0.005)	(0.003)
Ln(Assets)	0.013*	−0.011**	0.012*	−0.011**
	(0.007)	(0.004)	(0.007)	(0.004)
Constant	−0.046	0.057*	−0.045	0.057*
	(0.053)	(0.034)	(0.053)	(0.034)
Time fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm	Firm
N	186,064	174,515	186,064	174,515
Adjusted R^2	0.001	0.001	0.001	0.001

Note: The explanatory variable and the control variable are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

The next operating performance measure is *Employee growth*, calculated as the number of employees in a firm compared to one year earlier. In contrast to all other variables, the data on this variable is obtained once a year. The variable *Employee growth* is studied as raw number, as well as trimmed within the range -50% to +100% in respectively Table XVa and Table XVb. The first table shows a positive significant effect for $CSR \times Post\text{–}crisis_1$, which is the only significant effect for the explanatory variables, next to the control variable. This is remarkable because of the insignificant outcome in Lins et al., (2017) and implies a faster recovery for high CSR companies after the first crisis. Therefore, the second sub-hypothesis can be partially accepted. The constant is strongly significant and negative. The number of observations is much lower compared to earlier tables, however almost 50% higher in contrast to to Lins et al., (2017). The adjusted R^2 remains low.

When trimming the dependent variables within a -50% to +100% range, both aggregated crisis and post–crisis variables result in a significant effect in model (2a). This effect is however negative, in contrast to the earlier found positive effect on Employee growth in model (1b) in Table XVa. Taking model (2b) and (2c) into account, the earlier found effect can be attributed to both post–crisis variables, as well as $CSR \times Crisis_2$. This effect during and after the second crisis period is negative, while the effect after the first crisis period is positive. This implies a slower growth and recovery for high CSR companies during and after the second crisis. This partially accepts Hypothesis 3b for

Table XIVd: Operating performance variables surrounding both aggregated and individual crisis periods and CSR of Part III

	Sales per employee (in $000's) (5a)	Sales per employee (in $000's) (5b)	Sales per employee (in $000's) (5c)
CSR × Crisis	14.155***		
	(4.405)		
CSR × Post–crisis	8.928**		
	(3.776)		
CSR × Crisis_1		−3.023	
		(3.927)	
CSR × Post–crisis_1		−1.004	
		(3.201)	
CSR × Crisis_2			15.495***
			(4.086)
CSR × Post–crisis_2			7.164**
			(3.153)
Ln(Assets)	22.116***	22.404***	22.839***
	(3.921)	(3.956)	(3.951)
Constant	−36.245	−37.728	−33.908
	(29.972)	(30.287)	(30.202)
Time fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm
N	180,008	180,008	180,008
Adj, R^2	0.023	0.021	0.023

Note: The control variable is winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroscedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

the first crisis, but rejects it for the second crisis. Reiteratively, the constant variable is significantly negative and the adjusted R^2 is slightly higher regarding the previous model.

Table XVa: Employment growth variables surrounding both aggregated and individual crisis periods and CSR of Part III

	Employee growth (1a)	Employee growth (1b)	Employee growth (1c)
CSR × Crisis	−0.000		
	(0.024)		
CSR × Post–crisis	−0.002		
	(0.023)		
CSR × Crisis_1		0.000	
		(0.017)	
CSR × Post–crisis_1		0.026***	
		(0.009)	
CSR × Crisis_2			0.003
			(0.021)
CSR × Post–crisis_2			−0.010
			(0.019)
Ln(Assets)	0.068***	0.069***	0.068***
	(0.016)	(0.015)	(0.016)
Constant	−0.460***	−0.466***	−0.463***
	(0.122)	(0.119)	(0.127)
Time fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm
N	14,105	14,105	14,105
Adjusted R^2	0.001	0.001	0.001

Note: The control variable is winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroskedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

Table XVb: Employment growth variables surrounding both aggregated and individual crisis periods and CSR of Part III (continued)

	Employee growth in -50% to +100% (2a)	Employee growth in -50% to +100% (2b)	Employee growth in -50% to +100% (2c)
CSR × Crisis	-0.020^{***}		
	(0.007)		
CSR × Post–crisis	-0.012^{**}		
	(0.005)		
CSR × Crisis_1		-0.013	
		(0.014)	
CSR × Post–crisis_1		0.018^{***}	
		(0.007)	
CSR × Crisis_2			-0.013^{*}
			(0.007)
CSR × Post–crisis_2			-0.015^{***}
			(0.005)
Ln(Assets)	0.042^{***}	0.042^{***}	0.043^{***}
	(0.005)	(0.005)	(0.005)
Constant	-0.278^{***}	-0.278^{***}	-0.283^{***}
	(0.041)	(0.041)	(0.041)
Time fixed effects	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm
N	13,943	13,943	13,943
Adjusted R^2	0.011	0.011	0.011

Note: The control variable is winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroskedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

Furthermore, the capital raising abilities per firm will be taken as independent variable, to examine this as driver of excess returns and higher valuation. In this model, the control variables will be again the logarithm of assets, next to one-period lagged variables of cash holdings and total debt, as well as firm profitability. Firstly, the debt issuance divided by assets will be studied, whereafter equity issuance divided by assets is taken into account. Table XVIa shows the first variable, looking at the influence of CSR together with the aggregated crisis variable, even as the separated crisis variables. In model (1a), a negative significant effect of *CSR* × *Crisis* is reported, which can be attributed to *CSR* × *Crisis*$_2$, where the same effect is measured. This indicates a lower debt issuance during the second crisis period. Additionally, all control variables except for *Profitability* yield a logically significant effect on the dependent variable. The intercept is strongly significant and report a negative value. The adjusted R^2 is slightly higher with 8%.

Lastly, *Equity issuance divided by assets* is studied in Table XVIb. Here, both during and after the aggregated crises, a strongly significant positive effect is measured. This effect can also be connected to the second crisis period, as seen in model (2c) and entails a higher equity issuance during and after

the second crisis period. This could be supported by the lower debt issuance seen in the previous table, presuming that firms with high CSR score are more prone to attract equity than debt. This leads to a partially acceptance of the third sub-hypothesis.

The control variable *Ln(Assets)* yield a negative significant effect on the 1% level, as lagged total debt results a positive significant effect on the 10% and 5% level. Lagged cash holdings and profitability yield no significant effect, in contrast to the constant, which is positive. This is also opposite from the constant in Table XVIa. The adjusted R^2 is relatively high regarding the previous models, whereas Lins et al., (2017) report a proportionately low R^2 coefficient for this specific model.

Table XVIa: Capital raising variables surrounding both aggregated and individual crisis periods and CSR of Part III

	Debt issuance / Assets (in %) (1a)	Debt issuance / Assets (in %) (1b)	Debt issuance / Assets (in %) (1c)
CSR × Crisis	−0.013**		
	(0.005)		
CSR × Post–crisis	−0.004		
	(0.005)		
CSR × Crisis_1		0.001	
		(0.008)	
CSR × Post–crisis_1		0.003	
		(0.006)	
CSR × Crisis_2			−0.015***
			(0.005)
CSR × Post–crisis_2			−0.004
			(0.004)
Ln(Assets)	0.022***	0.021***	0.022***
	(0.005)	(0.005)	(0.006)
Cash holdings_{t-1}	−0.051**	−0.052**	−0.051**
	(0.021)	(0.021)	(0.021)
Total debt_{t-1}	0.294***	0.293***	0.294***
	(0.024)	(0.024)	(0.024)
Profitability	−0.031	−0.032	−0.031
	(0.078)	(0.078)	(0.078)
Constant	−0.130***	−0.128***	−0.131***
	(0.042)	(0.042)	(0.042)
Time fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm
N	183,970	183,970	183,970
Adjusted R^2	0.080	0.080	0.080

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroskedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

Table XVIb: Capital raising variables surrounding both aggregated and individual crisis periods and CSR of Part III (continued)

	Equity issuance / Assets (in %) (2a)	Equity issuance / Assets (in %) (2b)	Equity issuance / Assets (in %) (2c)
CSR × Crisis	0.007***		
	(0.002)		
CSR × Post–crisis	0.006***		
	(0.002)		
CSR × Crisis_1		−0.002	
		(0.003)	
CSR × Post–crisis_1		−0.001	
		(0.002)	
CSR × Crisis_2			0.007***
			(0.002)
CSR × Post–crisis_2			0.006***
			(0.002)
Ln(Assets)	−0.059***	−0.059***	−0.059***
	(0.004)	(0.004)	(0.004)
$\text{Cash holdings}_{t-1}$	0.010	0.011	0.010
	(0.014)	(0.014)	(0.014)
Total debt_{t-1}	0.022*	0.023**	0.022*
	(0.011)	(0.011)	(0.012)
Profitability	−0.074	−0.074	−0.074
	(0.054)	(0.054)	(0.054)
Constant	0.521***	0.520***	0.522***
	(0.027)	(0.027)	(0.027)
Time fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
SE clustered by	Firm	Firm	Firm
N	182,969	182,969	182,969
Adjusted R^2	0.325	0.323	0.325

Note: The explanatory variables and all control variables are winsorized at the 1^{st} and 99^{th} percentiles. The standard errors are robust for heteroskedasticity and clustering, and reported in parentheses. *, ** and *** indicate with a level of respectively 10%, 5% and 1% that the stated parameter significantly differs from zero.

Conclusion

This paper examines the trust-shock robustness of Corporate Social Responsibility by regressing scores obtained by firms with their stock prices, as well as financial health and performance measures.

The first tables show the results of the simple linear regression models during the first trust shock in 2008, coinciding with the global financial crisis. With the positive significant influence of Net CSR score on raw as well as abnormal return in Table IV and VIII, the first sub-hypothesis can be accepted. Nevertheless, in Tables V, and VI, the significance diminishes when the control variables are added. Hypothesis 1a will therefore be partially accepted. The added control variables are not all of significant influence in aforementioned tables. Yet, Long-term debt, Profitability and Momentum do have a valid influence, next to the newly introduced U.S. domicile dummy. This means that the second sub-hypothesis can also be partially accepted. Both sub-hypotheses together lead to a partial acceptance of Hypothesis 1.

Moreover, the second hypothesis will be studied. Table IX reports the outcome of part II of the research, focusing on the trust shock in 2018. This results in a non-significant outcome for the explanatory variables, as well as the control variables. However, the positive influence of the U.S. domicile dummy remains. As earlier mentioned, the positive outcome for *Long-term debt* results no logical economical explanation and is therefore not reliable. This outcome results in a rejection of both sub-hypotheses, and therefore in a rejection of Hypothesis 2.

The third hypothesis is studied in Part III of the research. Table X and XI partially accepts the first sub-hypothesis, which is substantiated by Table XII and XIII. It is remarkable that, resembling Part I and II of this study, the first crisis yields positive significant results, yet the more recent trust crisis refutes this outcome. A similar outcome is seen in Tables XIV and XV, resulting in a faster recovery for high CSR companies after the first crisis, and a slower recovery after the second crisis. This causes to partially accept the second sub-hypothesis. Lastly, the third sub-hypothesis is tested in Table XVI. Here, both the debt and equity issuance variables found no effect regarding CSR firms in the first crisis, yet they did find a negative effect on debt issuance and a positive effect on equity issuance for high CSR firms in the second crisis. This leads to a partial acceptance of the third sub-hypothesis and conclusively a partial acceptance of Hypothesis 3. With the interpretations of the three hypotheses, the research question can be answered:

Research question: What effect on their valuation, financial health and performance can trustworthy firms in the U.S. expect during periods of decline in trust using the CSR based method by Lins et al., (2017) as a starting point?

In periods of decline in trust that are associated with an economic decline, trustworthy companies can expect a positive effect on their valuation by shareholders, financial health and performance. This effect is not confirmed during periods of decline in trust that are not associated with an economic

decline. In all periods of decline in trust, U.S. based companies can expect a positive effect on their valuation by shareholders and financial health, compared to non-U.S. based companies.

A comparison with Lins et al., (2017) can be made, regarding the replication of their study. The outcome of this study is not a perfect match, still it resembles their research and supports their conclusion substantially. Nevertheless, it remains of importance to look at the definition of 'economic trust'. A financial crisis might need to accompany a clear dip in trust as defined by the Edelman Trust Barometer, for the extenuating effect of CSR to take place.

Limitations to the first part of the research are deviant manners of calculating abnormal returns and Idiosyncratic risk, leading to different outcomes than the Lins et al., (2017) paper. Next, the Fama & French three-factor model and a momentum factor were excluded from this paper, and could be incorporated to enhance the robustness of the outcome.

The outcome of Part II of the research is not completely reliable, because of the limited availability of CSR data in the year 2015. As seen in Figure 2, the distribution of the mean of the net CSR score is not stable, therefore it is not predictable if a company remains its score in CSR over two years. Nevertheless it is hard to use another data set, because of the non-relevance of the other parts of this research and the Lins et al., (2017) paper.

The third part of the research could be improved by extending the Post-crisis$_2$ period within the Difference-in-Differences model, to measure the post-crisis effects more accurately. In this research, the post-crisis$_2$ period occupies 6 months, in comparison to the 56 months for the post-crisis$_1$ period.

Recommendations for further research include the use of more detailed CSR information, whereas periods could be compared with each other in a more comprehensive way. Furthermore, it would be interesting to further research the individual effects of each CSR category over time, especially with the increasing interest in CSR investments. Next to this, Part III of the research could be repeated in approximately five years, to fully examine the exploited post-crisis effects. Lastly, the connection between CSR and trust could be deepened, to examine the role of economical characteristics in a trust crisis, for the robustness effect of the CSR to take place.

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A Appendix

A.1 Calculation of financial variables

The components of financial firm performance used as control and dependent variables are calculated using data on Compustat fundamentals. These variables are calculated using the following formulas.

1. Market capitalization = Closing price · Common shares outstanding
2. Long-term debt = Total long-term debt / Assets
3. Short-term debt = Debt in current liabilities / Assets
4. Cash holdings = Cash / Assets
5. Profitability = Operating income before depreciation / Assets
6. Book-to-market ratio = Common equity / Market capitalization
7. Gross margin = (Sales - Costs of goods sold) / Sales
8. Sales per employee = Sales (quarterly) / Number of employees (yearly)
9. Long-term debt issuance = Long-term debt issuance (yearly) / Assets
10. Equity issuance = Common shares issued / Assets
11. Total debt = (Long-term debt + Short-term debt) / Assets

A.2 Classification of SIC codes per industry

SIC range	Industry division
0100 – 0999	Agriculture, forestry and fishing
1000 – 1499	Mining
1500 – 1799	Construction
2000 – 3999	Manufacturing
4000 – 4999	Transportation, communications, electric, gas and sanitary services
5000 – 5199	Wholesale trade
5200 – 5999	Retail trade
6000 – 6799	Finance, insurance and real estate[1]
7000 – 8999	Services
9100 – 9729	Public administration

[1] Financial firms are only included in the 2018–2019 trust dip.
Source: United States Department of Labor, Occupational Safety and Health Administration. https://www.osha.gov/pls/imis/sic_manual.html

A.3 Eigenvalues Principal Component Analysis of Part I

	Eigenvalue	Difference	Proportion	Cumulative
Component 1	2.670	1.458	0.267	0.267
Component 2	1.212	0.133	0.121	0.388
Component 3	1.079	0.109	0.108	0.496
Component 4	0.970	0.070	0.097	0.593
Component 5	0.901	0.088	0.090	0.683
Component 6	0.813	0.069	0.081	0.764
Component 7	0.744	0.097	0.074	0.839
Component 8	0.647	0.155	0.065	0.904
Component 9	0.491	0.018	0.049	0.953
Component 10	0.473	.	0.047	1.000
N	2,963			

Note: These eigenvalues are a result from the Principal Component Analysis and are complementing the eigenvectors in Table VII and the scree plot in Figure 4.