Corporate Social Responsibility and Resilience: Perceiving Elusive Capital

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Abstract:

This paper provides an empirical analysis of the effect of Corporate Social Responsibility (CSR) engagement on firm resilience in adverse market conditions, measuring resilience using cumulative abnormal return over crisis periods and market betas derived from a dual-beta model. The results indicate that CSR engagement does not enhance resilience to crises in the short-term. In contrast, the results imply that CSR engagement lowers a firm's sensitivity to downward market movements and hence increases resilience in the medium term. This indicates CSR engagement builds 'elusive capital' and provides competitive advantages that surface during adverse market conditions. It also indicates that investors require time to integrate CSR performance in their valuations. Moreover, when firms exceed a given level of CSR engagement, marginal CSR improvements decrease the beta during expansion months, indicating that the resilience-inducing properties of CSR come at a cost. This paper provides a unique perspective on the dynamics between CSR and firm performance, extending the literature with the assessment of CSR in a dual-beta context. It exposes how CSR engaged firms react under various market conditions, yielding substantial implications for investors and portfolio managers. Moreover, the results suggest more elaborate research on the relation between CSR and resilience is required.

Keywords: Corporate Social Responsibility, resilience, crisis, market beta

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1 Introduction

Business's concern for society appears omnipresent, as investors and consumers alike have taken a keen interest in doing good. Firms are developing sustainability strategies and explicitly incorporate their contributions to a better world in their financial reports. Sustainable and responsible investment in the US has increased 18-fold compared to 1995 levels, constituting total assets under management of 12 trillion in 2018 (US SIF, 2018). Growth has accelerated since 2012, averaging 20% annually, indicating that responsible investment is gaining further traction. The growing relevance of Corporate Social Responsibility (CSR) adds a new dimension to investment analysis and decision-making processes. Even the most charitable managers need to explain to their shareholders the impact of CSR policies and traditionally, business is discussed in financial terms. The increased corporate interest for responsible investing and CSR has been matched by academics, attempting to provide scientific substantiation for the financial impact of CSR. The responsibilities of firms and financial implications have been discussed along the lines of the shareholder and stakeholder perspectives (Friedman, 1970; Freeman, 1984). Although some argue CSR to originate from agency conflicts (Cheng et al., 2013), increasingly, academics indicate that these strongly debated perspectives can be aligned. Generally, taking a shareholder perspective and engaging in CSR is found to be beneficial for shareholder value and returns (Hillman and Keim, 2001; Henisz et al., 2014; Servaes and Tamayo, 2013; Ferrell et al., 2016). CSR has developed into an integrated element of corporate strategies and greater academic scrutiny has articulated its value for businesses. CSR primarily builds firm value in two forms. CSR can be beneficial through incremental effects, increasing sales or justifying higher prices, or by enhancing harm reduction and risk mitigation. Incremental benefits stem from decreased costs of financing (Goss and Roberts, 2011), price premiums (Anselmsson et al., 2014), and customer purchase decisions (Mohr and Webb, 2005). Harm reduction benefits include better relations with employees, customers, and other stakeholders (Bénabou and Tirole, 2010), optimized supply chains (Porter and Van der Linde, 1995), and investor perceptions (Krüger, 2015).

An abundance of research assesses the long-term effect of CSR on firm value. The 2020 COVID-19 pandemic demonstrated how the market is sensitive to external conditions and how abrupt changes can induce volatility and rapidly evaporate company value. To advance the literature and potentially provide new insights on the effect of CSR on firm performance, I move away from the existing body of literature by questioning if CSR provides resilience to decreasing stock prices in the short and medium-term, assessing if CSR provides firms with capital and competencies that come to surface specifically during adverse market conditions. There have been few papers researching the effect of CSR specifically in the context of adverse market conditions. Schnietz and Epstein (2005) concluded that a reputation for social responsibility protected firms from the market shock following the Seattle World Trade Organization protests. Nofsinger and Varma (2014) found that responsible mutual funds outperformed

regular funds during depressed markets. Lins, Servaes, and Tamayo (2017) found that firms with high CSR levels outperformed competitors during the 2007-2008 crisis. The limited research on CSR and resilience causes the potential benefits of CSR in adverse markets to remain ambiguous. I pursue to extend the literature by further clarifying the relation between CSR and resilience and offer new perspectives on the value-increasing mechanisms of CSR engagement.

I theorize that CSR engagement is closely related to the formation of what is coined as 'elusive capital' in this paper. I define elusive capital as capital, resulting from the engagement in CSR, that is undervalued by investors. Engaging in CSR provides firms with competitive advantages (e.g. improved stakeholder relations, reputation, and customer loyalty) that help firms outperform the market during adverse market conditions and may provide resilience against crises and general market risk (Jones et al., 2000; Peloza, 2006). The harm-reducing and risk-mitigating characteristics of dynamic capabilities, social capital, and intangible assets providing this competitive advantage are difficult to value through regular valuation methods and therefore often undervalued (Choi et al., 2000). As a consequence, the value of these competitive advantages is elusive. In the light of crises or recessions, the stock of elusive capital may be revalued by investors, hence providing resilience to adverse market conditions. In pursuance of explicating the resilience increasing properties of CSR, this research focuses on the question if Corporate Social Responsibility enhances firm resilience in the short- and medium-term. Resilience is measured by assessing Cumulative Abnormal Returns over crisis periods (short-term) and market betas, measuring the exposure to market risk (medium-term). Corporate Social Responsibility engagement is proxied by a score computed from the MSCI ESG KLD Database. Environmental, Social and Governance (ESG) performance constitute an important dimension of Corporate Social Responsibility, which makes the use of the ESG KLD Database as a proxy for CSR engagement a widely accepted practice in CSR research (Kempf and Osthoff, 2007; Barnea and Rubin, 2010; Servaes and Tamayo, 2013). I articulate 8 hypotheses to analyze the relationship between CSR and short- and medium-run resilience, which are tested on an unbalanced sample containing data on 4371 firms between 1991 and 2018.

First, I examine the resilience effects of CSR engagement in the short term. Elusive capital, becoming apparent in the light of a crisis, is hypothesized to improve firm performance. 16 crisis episodes are classified using the Chicago Board Options Exchange Volatility Index, identifying episodes of abrupt, persistent market uncertainty. The results observed do not indicate a relationship between CSR and cumulative abnormal returns over the identified crisis episodes. Contrary to conclusions in prior research from Schnietz and Epstein (2005), I find no evidence for crisis resilience resulting from CSR engagement. Controlling for characteristics of industries and crisis episodes by including fixed effects does not alter these conclusions. To ensure these results are not produced by the method employed to

identify crises, I performed a robustness analysis. Assessing a subsample of selected crisis episodes did not alter the results. Hence, the appearance of elusive capital in crisis times is not confirmed.

Second, I seek to assess the relation between CSR engagement and exposure to market movements. It is hypothesized that CSR provides resilience to general market exposure, drawing on observations from Nofsinger and Varma (2014). Additionally, their research is extended by separately estimating recession and expanding market betas. Employing a dual beta market model enables an accurate assessment of the effect of CSR in different market states. Hence, I can analyze if CSR provides resilience in recession times and how this impacts market sensitivity in growth markets. The linear regression specifications find no relation between CSR and regular market betas or betas in expanding markets. More importantly, the results significantly and consistently display that firms with high levels of CSR engagement have lower market betas. The indicated lower exposure to systemic risk in a medium-term window provides support for the beneficial effects of elusive capital. Therefore, I argue that CSR engagement provides resilience to adverse market conditions in recession markets.

Thirdly, I assess if CSR effects are the largest at an 'optimal' level of CSR engagement. Non-linear regression specifications are employed to capture potentially uneven effects exhibited by CSR engagement. I find results that indicate the relation between CSR and general market sensitivity is non-linear. However, the direction of the observed relation contradicts my initial expectations. Rather than an 'optimal' CSR level at which market sensitivity is the smallest, there appears to exist a CSR level for which market exposure is the largest. It is only after surpassing this level that market sensitivity decreases. This relationship is particularly explicit for months classified as expansion months. It indicates that for firms with average CSR engagement, sensitivity to upward markets is relatively high. However, when firms exceed a given level of CSR engagement, sensitivity to positive market sentiments starts to decrease exponentially. Firms in upper-bound segments of CSR engagement experience a substantially lower market sensitivity in expanding markets, potentially hindering these firms from benefitting from positive market sentiments. This effect equally occurs for firms with the lowest CSR engagement scores. I infer the market penalizes firms that underperform on Corporate Social Responsibility engagement. Similarly, the market appears to penalize firms that are perceived as being too engaged, potentially signaling overinvestment and agency conflict as argued by Cheng et al., (2013).

Finally, I assess if my results are robust to altering the assumptions underlying key variables. Acknowledging that the CSR score used is a construct, I attempt to alleviate concerns about the opted measure of CSR engagement by using a score that requires fewer alterations and is, therefore, less dependent on the chosen methodology. Then, I attempt to assess if the crisis classification method is determinative to not finding evidence for the hypothesis on crisis resilience. Furthermore, I perform a regression using stricter prior data requirements for dual beta calculations. In the first and third

robustness analyses, I find a highly significant and negative relation between CSR and the market beta in recession months.

Overall, this paper reports empirical findings that advance the understanding of the relationship between CSR and firm performance. CSR engagement decreases firms' exposure to market risk in recession times. For firms with the highest CSR levels, this comes at the cost of lower sensitivity to expansion markets. I provide directions for further avenues of academic research in the field of CSR, arguing that an in-depth assessment of social responsibility engagement scores can strengthen the interpretability of relations found. For business, this research emphasizes the value of CSR in signaling market risk in different states of the economy, holding consequences for portfolio management strategies.

The remainder of the paper is structured as follows. Section 2 proceeds with assessing prior literature and relevant theory and is concluded with setting forth hypotheses. Section 3 describes the data collection and the employed methodology. Section 4 reports the performed regression and found results. The main findings of the paper are discussed in Section 5, considering potential limitations and implications for investors and academics.

2 Literature review and theoretical framework

2.1 Balancing business and burdens

The traditional economic perspective on the objective of the firm has been unambiguous. As Friedman (1970) canonically argued; the primary responsibility of the firm is to its investors. Investors demand wealth maximization, in the form of accumulating profits and increasing company value. Friedman discards the idea that firms have a social conscience or responsibilities other than to their shareholders. Firm governance would be an agreement merely between a firm's owners and management and driven purely by economic incentives. Freeman (1984) challenges this traditional objective of the firm and counters the argumentation of Friedman by establishing a structured foundation for the stakeholder theory. From the stakeholder perspective, the external environment is essential to a firm's success, indicating the incentive to foster stakeholder relations. Additionally, the objectives and responsibilities of a firm surpass simply maximizing profits as businesses take a fundamental position in society. The contributions of these scholars have contributed to an ongoing, impactful debate about the role of firms; the shareholder versus the stakeholder perspective.

Friedman argues companies are not to engage in any activities that do not directly contribute to an increase in firm value. This market value, in the simplest form, is a function of discounted firm profits. The endeavors to earn these profits come with associated (external) costs and responsibilities. It requires firms to strategize, take risks, and invest accordingly. Firms are subjected to an intertemporal optimization problem. In this problem, choices determine profitability and create future opportunities. This implies that companies must find a balance between short term profit maximization and long-term strategy. In line with Friedman's arguments, the intertemporal maximization problem drives firms to assess the impact of a firm's contemporary business on its future ability to realize profits. Firms are required to think about how their current activities affect their future opportunities. Hence, the seemingly opposing perspectives of both Friedman and Freeman are not always mutually exclusive. By taking the stakeholder perspective, firms can maximize the shareholders' future wealth. The optimization problem demands companies to develop an equilibrium long-term investment strategy that weighs future needs and with currents costs and responsibilities.

In the best form, this optimization problem is a self-regulating mechanism where companies commit to limit their externalities and negative impact to ensure a sustainable society where business interests are balanced with social costs. In the worst form, the market is unable to correct these external costs and society bears the full burden. Heal (2005) differentiates between private and social costs of business. If the spread between these costs is excessive, companies can be held accountable for the social costs (externalities) incurred by society, establishing a risk and potential liability for these firms. This is the case when governments use legislative power to restrict a factory from polluting a nearby river or when

customers boycott a product as a result of unacceptable working conditions. When social costs are lower or harder to assess, markets can nevertheless produce an outcome that is optimal from a total wealth perspective. However, these results can be distributed unfairly as these costs are often borne by groups or entities that cannot resist or respond effectively (countries with low employee protection, natural environments).

Corporate Social Responsibility engagement can bridge this gap, potentially facilitating (auto)regulation of the business environment, ensuring 'the invisible hand produces the social good', and rebalancing the distribution of social costs. Additionally, CSR could increase profits and protect against several forms of risk, serving as an extension to the classic neoliberal free-market model. 45 years before Heal, Coase (1960) articulated the concern that the cure for social costs must not be worse than the problem. He suggested a balanced consideration of corporate gains and associated social costs and argued that methods to alleviate social costs must be proportionate. Comparable concerns surround CSR, fearing it is a substantial financial burden that limits companies in their profit-making potential and restricts them when flexibility is required. This implies firms would halt CSR engagement in times of economic downturns. Nonetheless, Harwood et al. (2011) found that CSR activities were not decreased during constraint economic times, against popular expectations, indicating CSR provides more value than conveyed simply by assessing company valuations.

2.2 Corporate Social Responsibility and the objective of the firm

The increased attention for social costs, externalities, and the burdens of business has increased attention for stakeholder approaches, the sustainability of corporate operations, and a fair distribution of the gains of business. In this wide realm of 'doing good in business', Dahlsrud (2008) suggests that the definition of Corporate Social Responsibility depends heavily on the context and that 'the social responsibility' of a company is firm-specific. In this paper, I define Corporate Social Responsibility as all efforts dedicated to mitigating negative externalities result from the activities of a firm and improving the fairness of conducting business. In the empirical section of this paper, ratings from the MSCI ESG KLD STATS Database will be employed as a proxy for Corporate Social Responsibility engagement. This section discusses the literature on the relationship between CSR and company value and assesses how welfare and wealth maximization are connected.

2.2.1 CSR and company value

Friedman (1970), an outspoken critic of CSR engagement, is famously quoted arguing 'the only social responsibility of business is to increase profits'. He encourages businesses to pursue any activity not forbidden by law to increase their profits. Companies engaging in Corporate Social Responsibility, in his perspective inherently inefficient and value-destroying, were said to be disloyal to their owners, the

shareholders. Other authors debating the market perspective of Friedman have fueled a discussion of stakeholders versus shareholders. Frederick (1960) had proclaimed 'the end of laissez-faire' a decade earlier and pleads the responsibilities of business should reflect a degree of social awareness and go beyond mere profit-making. Nevertheless, increasing corporate attention for social responsibility was received with a degree of caution by economists.

Researchers have been suspicious of the value-increasing properties of CSR and have found value and CSR to be non- or even negatively related in instances. King and Lenov (2001) question the value-enhancing properties of CSR and do not find the supposed relationship after controlling for firm characteristics and strategic position. Some perceive CSR as a product of agency problems, with managers consuming private benefits at the expense of shareholders in line with the agency theory posed by Jensen and Meckling (1976). Barnea and Rubin (2010) argue that investing in CSR may reap more reputational than financial benefits, as insider ownership is negatively related to a firm's CSR rating. CSR in this respect it motivated by the personal gain of managers. Cheng et al., (2013) highlight that 'goodness investments' can increase firm value, although firms may overinvest due to agency problems. Furthermore, CSR can be dismissed as mere window-dressing. Kotchen and Moon (2012) discover that companies that do wrong in specific CSR categories compensate by engaging in CSR in other categories. This behavior, which CSR both ineffective and inefficient, is stronger for harmful companies and in industries that are under greater public scrutiny, such as the fossil fuels and mining industry.

The growing body of research and increasing academic interest surrounding CSR and firm value has been accompanied by a shift in academic consensus. Empirically assessing the effect of CSR on firm value, numerous scholars have refuted the idea of CSR being inefficient or value-destroying, concluding that social and shareholder interests are more aligned than previously believed and ruling in favor of CSR engagement as a means to wealth maximization. Dowell et al. (2000) find that corporations with higher global environmental standards receive significantly higher market values, as negative externalities are generally incorporated in firm valuation. Negligence and unaddressed external costs are perceived by investors as liabilities that reduce the value of the firm. Hillman and Keim (2001) identify the value-increasing effects of CSR and demonstrate how stakeholder management is complementary to shareholder value creation. The positive relationship between stakeholder support and firm value is later confirmed by Henisz et al. (2014).

The notion of CSR engagement as a method of wealth maximization furthermore holds from a portfolio perspective. Bauer et al. (2005) observe no significant difference between performances of ethical mutual funds and conventional funds in the period 1990-2001, indicating no diminished value resulting from CSR engagement. Statman (2005) finds special CSR indexes to outperform the S&P 500 during a market expansion in the 1990s yet underperform during the early 2000s recession. Kempf and Osthoff

(2007) conclude that a trading strategy that purchases stocks with high social responsibility ratings and sells that with low ratings can provide high abnormal returns. There is ample recent support of academics confirming that CSR engagement enhances shareholder value creation (Servaes and Tamayo, 2013; Gregory et al., 2014; Fatemi et al., 2015; Ferrell et al., 2016).

2.2.2 Aligning welfare and wealth maximization

Investors and consumers have displayed an increased interest in environmental impact mitigation and social contributions. Firms are developing sustainability strategies and publish financial reports that explicitly incorporate their contributions to a better world. This shift is partly revealed by higher valuations of firms with high levels of CSR engagement. Porter and Kramer (2006) plead for firms to adopt a coherent, strategic CSR policy, creating a better outcome for society, and providing companies with a competitive advantage. In addition to increasing consumer interest, CSR engagement can provide a competitive advantage through several mechanisms. This section illustrates channels through which CSR increases firm value. As Peloza (2006) articulates well, CSR provides economic benefits in two ways; 'incremental benefits and potential mitigation of harmful events'.

A fundamental factor increasing corporate value is that CSR engagement decreases the costs of financing. Goss and Roberts (2011) discover that companies that underperform on CSR issues pay a premium on bank debt. Similar findings are reported by Dhaliwal et al. (2011). CSR concerns are perceived as a business risk by banks, which consequently penalize these companies in the form of higher interests. A second factor is how CSR relates to customers' perceptions, and behavior. Anselmsson and Bondesson (2014) suggest that customer CSR perception of a brand is a significant determinant in the willingness to pay a premium on products in the food industry. In a survey distributed under US adults, Mohr and Webb (2005) conclude that in some instances, CSR affects purchase intentions stronger than price. As market demand patterns are changing and consumers demand responsible products and companies, firms with high CSR ratings are valued higher by consumers. Furthermore, firms that correctly anticipate future market demand shifts can be attributed large growth values by investors, as is the case in the market for artificial meat and meat substitutes.

Bénabou and Tirole (2010) report the importance of a long-term perspective to optimize future profit-generating opportunities. Relations with stakeholders, such as customers, suppliers, and employees, are fostered by investing in CSR and stakeholder engagement. Customer attraction, supplier continuity, and employee retention are expensive operations and by engaging in CSR, firms can decrease future costs and increases their value. Porter and Van der Linde (1995) hypothesize how environmental regulations and benchmarks can trigger innovation and beneficial initiatives, potentially offsetting the costs of complying with these criteria. Companies can use CSR to introduce benchmarks to decrease material usage, manage production, and lower abatement costs by reevaluating their supply chain. Economizing on safety and pollution initiatives may boost short-term profits, nevertheless exposes the firm to the risk

of future lawsuits and claims. Bénabou and Tirole (2010) hypothesize it is even possible for companies to support stricter legislation as a form of competing. Firms can set strategic benchmarks for the industry and competing firms and in this way generate a competitive advantage. Finally, investors' reaction to CSR information is relevant. Krüger (2015), studying CSR reporting and announcement, demonstrates that investors react significantly more negatively to news of poor CSR performance than to assuring CSR news. By preemptively commencing CSR initiatives firms prevent public shaming and bad publicity decreasing company value.

Additional value-increasing mechanisms of CSR engagement to consider include free publicity of new initiatives from media outlets, tax benefits, and investors preferring shares of responsible firms, substituting personal giving for corporate charity. These channels are not mutually exclusive, nor do they cover all value-enhancing mechanisms of CSR engagement. This section does, however, contain an overview of the range of interdepend factors relevant to the relation between CSR and firm value.

2.3 Valuation of elusive capital

Valuation theory and models generally assume that prices are perfect, and the market's assessment of value is equal to the true price, assuming all available information is relevant and integrated into an investor's price assessment. Company value is frequently estimated with the present value of all future cash flows and a growth value component. Company valuation is complex and the market's valuation can deviate excessively from the book value of a company. Perceived growth value and other future expectations contribute to a divergence between market capitalization and book value, growing larger over time. Fama and French (2007) find an annually increasing average price to book ratio for 1927-2006. Potential mispricing becomes clear from observing price corrections sometimes associated with market shocks, challenging the market's ability to correctly value companies.

The value-enhancing channels mentioned in section 2.2 constitute direct and measurable consequences of CSR for firm value. However, CSR also affects company value through less direct channels. Standard and Poor's has recognized the 'growing importance of non-financial disclosure in the overall assessment of a company's risk profile' for a long time (United Nations Environment Program, 2004). Businesses are subjected to a changing society and business environment and non-financial capabilities are increasingly relevant as a source of value creation. The increased importance of non-financial capabilities increases market complexity and decreases the accuracy of analysts attempting to model the (regulatory) environment, market parameters, risk factors, and company fundamentals. Besides, it has proven challenging for academics and investors to correctly measure and quantify the value of intangible assets. Whereas tangible assets are physical assets with a finite value and life span (e.g. machinery, inventory, and securities), intangible assets are non-physical assets and can represent future

value (e.g. patents, brands, and other intellectual property). Choi et al. (2000) indicate that the market attributes a lower value to intangible assets than to tangible assets and argue the required amortization of intangible assets to be unnecessary. Gu and Wang (2005) discover the proportion of intangible assets of a firm to be positively associated with analysts' forecast error. Furthermore, companies' resilience to unforeseen circumstances is complicated to predict as dynamic capabilities, short-term response, and overall likelihood of overcoming market shocks are difficult to quantify. The increasing complexity of information impedes investors' ability to correctly assess value and future performance. Financial reporting and accounting methods have not succeeded in developing integrated measures for growth value, intangible assets, and non-financial disclosures, resulting in a structural misvaluation of these components. These elements are difficult for investors to formally quantify, yet provide an important competitive advantage, and will therefore be characterized as 'elusive capital'.

2.3.1 CSR and elusive capital

CSR engagement can have multiple consequences that do not directly or explicitly increase the valuation of its stock. It affects reputation, the stock of intangible assets, and other non-financial capabilities. For example, empirically predicting the results of an integrated strategy, where CSR constitutes an important aspect, is more difficult than it would be for a regular strategy (Baron, 2001). Additionally, CSR engagement can occasionally constitute completely new classes of intangible assets, making the previously mentioned valuation errors of intangible assets more pressing for recently produced, CSR related intangible assets. Firms with high levels of CSR engagement proportionally retain more 'elusive capital', which may be undervalued or not even reported on the balance sheet. The complexity of integrating this capital into formal valuation methods does not contradict its value. Elusive capital consists of undervalued intangible assets, social capital (Henisz et al., 2014), dynamic capabilities, preemptive compliance with future requirements, or the anticipation of changing legislation (Clarkson, 1995), mitigation of risk, and avoidance of costly future investments.

Bhattacharya and Sen (2004) argue that by investing in CSR, firms build up a 'reservoir of goodwill', providing resilience to negative information about the firm. Similarly, Vanhamme and Grobben (2009) conclude that companies' CSR claims can help restore the company image, mitigating the impact of negative publicity. However, consumers only accepted these claims when firms had a credible reputation and substantial history of CSR engagement. Zahller et al. (2015) find that voluntary high-quality CSR disclosure enhances credibility and trustworthiness and provides greater organizational resilience to exogenous shocks. These studies illustrate how a changing business environment can expose elusive capital and how the value of these investments becomes explicit. The next section will elaborate on how this elusive capital can help companies during adverse and crisis times.

2.3.2 Elusive capital as a source of resilience

Components of elusive capital, such as reputational benefits, dynamic capabilities, and the possibility of determining new benchmarks, can provide value when confronted with adverse market conditions**.** When the market is hit with a shock, elusive capital can help a company remain competitive. The ability to anticipate or react to unexpected events (e.g. regulatory changes, demand shifts, or pandemics) determines a company's ability to survive and thrive. Companies are rewarded for their investment as the stock of elusive capital provides an advantage over competitors. De Oliveira Teixeira and Werther (2013) describe different types of innovation and argue how anticipatory innovation provides firms with both a competitive advantage and resilience in financially challenging times. Standard economic theory argues that the risk-mitigating attributes of CSR engagement are integrated into the stock price, as the market integrates all relevant information. However, I presume that during adverse market conditions elusive capital becomes more relevant and apparent. Several competencies or qualities can be hidden from investors and come to light only when the market deems them more important. Reevaluation of assets and capabilities will lead investors to change their perspective on firms and their competitive opportunities. Beermann (2011) describes how climate change-induced risk is 'complex, uncertain, and characterized by a high degree of unpredictability'. This illustrates the risks organizations face in the near future and points out how reducing environmental impact and dependence on non-renewable resources can provide an advantage over competitors. Lins, Servaes, and Tamayo (2017) observe the effect of social capital, or trust, on companies' performance following the 2008 crisis. When investors penalized untransparent markets and companies and social trust declined unexpectedly, firms with higher levels of stakeholder trust significantly outperformed their peers. Jones et al. (2000) examined the resilience of companies during two stock market crises and found that a good reputation could serve as a buffer against market crashes. As Peloza (2006) articulates well, besides providing benefits by increasing sales and prices, CSR can serve as protection, providing 'the ability to maintain sales and pricing levels in terms of crisis'. Crisis resilience is an issue of relevant performance. As the market penalizes wrongdoing and poor governance, companies that can react to shifting demands, provide for new needs, and gain investors' trust will outperform their competitors after crises. CSR engagement can help companies build these competencies and will therefore help companies to be more resilient. Overall, firms with high CSR engagement, retaining more elusive capital, possess better opportunities and capabilities that become more apparent or beneficial in times of crisis.

2.4 Hypothesis development

I have provided a theoretical substantiation for why firms with high Corporate Social Responsibility engagement hold more elusive capital, resulting in a competitive advantage when the market experiences a crisis. An extension of the current literature is the perspective that CSR offers companies

an advantage during and following distressing market conditions, which I will label 'crisis resilience'. CSR as a long-term investment in elusive capital directly influences a firm's ability to withstand crises. When a market-wide shock hits, elusive capital can mitigate the impact of such an event. In the specific context of Corporate Social Responsibility, Avery and Bergsteiner (2011) find how sustainable leadership, containing elements of CSR, 'enhances the performance of a business and its prospects for survival'. Therefore, the stock value of firms with high levels of CSR engagement is more resilient to adverse market conditions. Furthermore, in accordance with the 'reservoir of goodwill' analogy from Bhattacharya and Sen (2004), Schnietz and Epstein (2005) theorize that a firm's reputation for social responsibility signals reduced risk of boycotts and preemptive compliance with potential regulatory restriction, consequently protecting firms from stock price decline during the 1999 World Trade Organization protests. Based on the literature discussed, I expect that the Cumulative Abnormal Return (CAR) over the event window around a crisis is higher for companies with higher levels of CSR engagement, leading to the first hypothesis.

1. *CSR engagement is positively related to Cumulative Abnormal Return during market crises.*

I continue to theorize that the resilience effect of CSR engagement is not only applicable to crises and provides general resilience to medium-term negative market sentiments, which I will label 'market resilience'. This implies that in the light of the business cycle, the value of firms with higher CSR engagement will be less sensitive to downward market movements. This theory is supported by similar conclusions of Nofsinger and Varma (2014), who observed that socially responsible mutual funds do better in times of crisis. However, the downside of this limited risk is underperforming in growth markets. Connecting the results of Nofsinger and Varma with the assumption that firms with high CSR engagement will have a longer-term focus and strategy, I arrive at my second hypothesis.

2. *CSR engagement is negatively related to the market beta.*

Multiple researchers have suggested and confirmed that companies respond differently to recession times and expansion periods, estimating separate (dual) betas for each market state (Fabozzi and Francis, 1977; Woodward and Anderson, 2009). I extend the second hypothesis by integrating CSR theory with research on dual betas, separately assessing the market sensitivity in recession and expansion markets. I expect high CSR engagement to constrain firms in benefitting from positive market sentiments, resulting in a lower beta during expanding economies. Similarly, it limits the downside risk and decreases market sensitivity during times of economic downturn. These firms hence experience less downward price pressure from the market and CSR will provide resilience against market sentiments and systemic risk, expressed in a lower beta. These considerations lead to the next hypotheses.

3. *During an economic expansion, CSR engagement is negatively related to the market beta.*
4. *During a recession, CSR engagement is negatively related to the market beta.*

Increasing CSR engagement strengthens commitments to stakeholders. While Becchetti et al. (2015) acknowledge the potential value-increasing effects of decreasing shareholder conflict risk, they suggest that it simultaneously reduces firms' flexibility to respond to productive shocks. The resulting earnings insecurity is associated with increased idiosyncratic risk. Similarly, Barnea and Rubin (2010) observe that CSR engagement can create value for a firm, however, overinvestment as a result of agency conflicts can decrease firm value. McWilliams and Siegel (2001) employ a demand and supply framework to find the desired CSR level, implying there is an optimal level of CSR engagement. Similar to the effect on firm value, CSR engagement may hold a non-linear relationship with crisis resilience and market resilience. The supposed decreased flexibility may find investors penalizing companies with the highest levels of CSR engagement in times of crisis. Consequently, I formulate the fifth hypothesis.

5. *The positive relation between CSR engagement and Cumulative Abnormal Return during crisis times decreases above an optimal level of CSR.*

Finally, I theorize that over optimal CSR engagement diminishes the market resilience effect from CSR engagement. If firms engage in CSR at levels the market perceives as excessive, CSR engagement may increase firms' sensitivity to market movements. Hence, in line with hypotheses 2-4, I formulate an additional set of hypotheses.

6. *The negative relation between CSR engagement and the market beta decreases above an optimal level of CSR engagement.*
7. *The negative relation between CSR engagement and the market beta during a recession decreases above an optimal level of CSR engagement.*
8. *The negative relation between CSR engagement and the market beta during an expanding economy decreases above an optimal level of CSR engagement.*

3 Data and Methodology

3.1 Data

3.1.1 Sustainability data

The data on CSR is sourced from the Morgan Stanley Capital International (MSCI) ESG KLD STATS database. This database provides yearly ratings for environmental, social, and governance indicators to institutional investors. The dataset is composed by collecting data on a macro level from academic, government, and NGO datasets, company disclosures, media, and additional stakeholder sources. The ESG KLD database coverage, which at the time of research spanned from 1991 to 2018, covers a wide range of CSR performance indicators for a large number of companies and enables over time comparability by applying criteria carefully and consistently. The ESG KLD database has frequently been employed as a measure of CSR engagement in academic studies (e.g. Hillman and Keim, 2001; Kempf and Osthoff, 2007; Barnea and Rubin, 2010; Cheng et al., 2013; Servaes and Tamayo, 2013; Krüger, 2015). The Thomson Reuters Asset4 is an alternative sustainability database. It has larger international coverage and therefore allows for global comparison. However, partially to ensure that the complete sample adheres to minimum accounting standards (GAAP by the Financial Accounting Standard Board), this paper focuses on US firms listed on domestic stock exchanges. This limits the possibility of accounting standards affecting the company valuation process and therefore diminishes the benefits of the Asset4 database's international data. Considering the larger time coverage and the extensive usage of the ESG KLD database in other research, I choose to work with the ESG KLD database.

The ESG KLD database distinguishes between three major categories: Social, Environmental, and Governance (ESG). The categories are divided into subcategories: community, corporate governance, diversity, employee relations, environment, human rights, and product subcategories. All categories consist of performance indicators that are either labeled strengths or concerns. MSCI providing a binary score for strengths and concerns, registering a '1' if it applies, denoting an exceptionally positive or poor performance for that indicator, and '0' otherwise. An illustration of a strength is companies taking advantage of opportunities in renewable power production by increasing investments, capacity, and following trends. An example of a concern is human rights, complying with abuse and displacement of humans, or complying with repressive governments involved in these actions. A complete overview of relevant strengths and concerns is provided in the MSCI ESG KLD Stats Manual (2016).

3.1.2 Firm and market data

All databases used in this research are accessed using Wharton Research Data Services. The financial data on a firm-level is sourced from the Compustat database. Yearly company financial data and control variables are retrieved for all US firms included in the ESG KLD database during 1991-2018. Furthermore, the Compustat database provides the industry of sampled firms. Industry classification is done according to the Global Industrial Code Standard (GICS). For included industries please see the descriptive statistics. Daily information on stock prices, shares outstanding and the S&P 500, I retrieve from the Center for Research in Security Prices (CRSP) database. For a complete overview of the variables employed in this paper I refer to Appendix A1.

3.1.3 Constructing the CSR engagement variable

The ESG KLD database includes 77 indicators in the most recent specification. The range and number of variables monitored vary over time and per firm. To effectively employ the information in the database as a measure of CSR engagement one must construct a score that is comparable across companies, deciding what variables to include and how to compare the different variables. Some researchers limit their research only to assess companies' affiliation with vices, or sin stocks (Hong and Kacperczyk, 2009; Kim and Venkatachalam, 2011; Blitz and Fabozzi, 2017). When taking a broader approach, researchers compose a score themselves, deciding on what categories to include and how to weigh different CSR indicators. The assumptions made composing the score can be determinative for the results found. Hence, the inclusion of the Governance category is sometimes debated. The incentives for engaging in governance CSR can be argued to be dissimilar from the motivation for social and environmental CSR. Also, some perceive governance CSR as a form of entrenchment and potentially detrimental to the firm (Hong et al., 2012). This paper builds on the assumption that shareholder and stakeholder interest can be aligned and I, therefore, choose to include all categories. The construction of a coherent, comparable CSR score from the ESG database has been documented by numerous academic authors. The two methods of composing a CSR engagement variable are either a summed CSR score or a proportionate CSR score.

The summed score simply sums all strengths and subsequently subtracts the concerns registered within a category (Statman and Glushkov, 2009). For the Environment, Social, and Governance categories a company receives separate scores, which are summed to provide a total score.

$$Environmentsum_{f,t} = \sum_{i=1}^{N} EnvironmentStrength_{f,t,i} - \sum_{i=1}^{N} EnvironmentConcern_{f,t,i} \quad (1.1)$$

$$Socialsum_{f,t} = \sum_{i=1}^{N} SocialStrength_{f,t,i} - \sum_{i=1}^{N} SocialConcern_{f,t,i} \quad (1.2)$$

$$Governancesum_{f,t} = \sum_{i=1}^{N} GovernanceStrength_{f,t,i} - \sum_{i=1}^{N} GovernanceConcern_{f,t,i} \quad (1.3)$$

$$CSRsum_{f,t} = Environmentsum_{f,t} + Socialsum_{f,t} + Governancesum_{f,t} \quad (2)$$

For each category, I sum all established strengths for firm f in year t and subtracts all registered concerns for firm f in year t, using equations 1.1 – 1.3. Equation 2 provides variable $CSRsum$, the total score over all three categories for firm f in year t. The benefit of an unweighted, summed score is that the score is only affected if the performance on indicators was exceptionally positive or poor. It does therefore reduces the 'noise' from neutral '0' scores. However, the summed score carries multiple disadvantages, as it does not consider MSCI monitoring a different number of indicators per firm or the removal or addition of performance indicators over time. This complicates year over year comparison and potentially dilutes results due to differences across firms in the number of variables monitored.

Alternatively, a proportionate score is calculated, employing a method comparable to Waddock and Graves (1997).

$$Environment_{f,t} = \frac{Environmentsum_{f,t}}{\sum_{i=1}^{N} EnvironmentIndicator_{f,t,i}} \quad (3.1)$$

$$Social_{f,t} = \frac{Socialsum_{f,t}}{\sum_{i=1}^{N} SocialIndicator_{f,t,i}} \quad (3.2)$$

$$Governance_{f,t} = \frac{Governancesum_{f,t}}{\sum_{i=1}^{N} GovernanceIndicator_{f,t,i}} \quad (3.3)$$

$$CSR_{f,t} = \frac{Environmentsum_{f,t} + Socialsum_{f,t} + Governancesum_{f,t}}{\sum_{i=1}^{N} TotalIndicator_{f,t,i}} \quad (4)$$

For all categories, a score is constructed per category by adding the relevant strength indicators and subtracting the relevant concerns, as was done for the summed score. Next, this score is divided by the number of items assessed in that category, for firm f in year t, resulting in a proportionate CSR engagement score per category. Equations 3.1 – 3.3 provide us with the variables Environment, Social, and Governance. This allows to differentiate between categories and infer conclusions on the effect of individual categories. The total proportionate CSR engagement score of firm f in year t, CSR is then obtained by pooling all strengths and concerns registered, and dividing this by the total number of indicators assessed for firm f in year t, as displayed in equation 4.

Items that were rated as 'Not Researched' by MSCI were not included in the number of indicators assessed in that year. The categories are different in size, with Social composing the majority of indicators assessed. Therefore, instead of weighing the categories equally, I chose to weigh each category in proportion to the number of indicators monitored. By attributing equal weights to all indicators, irrespective of their category, I hope to limit the possibility of amplifying measurement decisions made by the MSCI, yet still include all items the MSCI considered worth reporting.

The proportionate measure has several advantages over using the summed score. The ESG KLD database has monitored a changing number of variables over the years, hence this approach better allows for comparison over time. Furthermore, some performance indicators are only applicable to certain

industries or firms. Therefore, the summed score can wrongly imply that one firm is more socially responsible than another firm when they may be subjected to different assessments. The proportionate score allows for a better performance assessment across firms and industries. Both engagement scores hold merits and downsides. The proportionate CSR score allows for better comparability and is better suited for this research, therefore it will be the primary variable employed in this paper. For robustness reasons, I perform multiple regressions with the summed CSR score.

3.2 Methodology

The fundamental models in this paper revolve around short-term crisis resilience and medium-term market resilience. The crisis resilience hypothesis of companies is tested by regressing the Cumulative Abnormal Return for identified market shocks on CSR. Testing the hypotheses around market resilience involves a regression model with a regular beta, in addition to regression models with independent betas for recessions and expanding markets, computed with a dual-beta market model. Lastly, hypotheses theorizing the optimal level of CSR involve the calculation of a quadratic variable. This section describes the methodology of constructing the variables required to test the hypotheses.

3.2.1 Crisis resilience

Crisis resilience will be proxied by firms' CAR during a market shock, which is calculated over a 5-day event window surrounding crisis market shock episodes. The CAR subsequently is regressed on CSR engagement to assess the relationship between CSR and crisis resilience. For this research, it is imperative to narrowly define the concept of crisis and identify related episodes over the sample period. This paper perceives crises to be episodes of abrupt adverse market conditions, characterized by excessive market volatility. To identify these episodes, I employ the Chicago Board Options Exchange Volatility Index (VIX) which is an indicator of market uncertainty. The VIX denotes investors' perspective on stock market volatility expectations for the next 30 days and is negatively correlated to the S&P 500. A spike in the VIX therefore often correlates with a decline of the S&P 500 (Szado, 2009). To identify shock episodes I establish a critical benchmark value. When the VIX surpasses the critical value 5 subsequent days, an indication of severe market distress, this is classified as a shock. The first day exceeding the critical value qualifies as the starting day of the shock [t_0]. The moving arithmetic average over 100 trading days, adding two standard deviations, is selected as the critical value. Adding two standard deviations to a running average assures correction for prolonged periods with increased market volatility and only includes episodes with a relatively severe increase in uncertainty. Furthermore, as the VIX is rather volatile itself, I demand the benchmark value to be exceeded for 5 subsequent days, to exclude exceedances of the benchmark value that are only incidental and hold a limited effect on the market.

During the period 1991 to 2018, I identify 20 market shocks. The shock episodes were manually checked with the S&P 500 index and 18 of these shocks correspond with significant reported economic events and adversities. Generally, increased market volatility expectations cause investors to demand higher rates of returns and stock prices to fall. Although the correlation is strong, expected market volatility run-ups are not always reflected in stock prices (Whaley, 2001). For robustness and integrity purposes I do not exclude shocks based on their association with distinguishable market events. One modification is made by excluding shocks that follow other shocks closely, overlapping the event period of one shock with the estimation period of the following. After excluding 4 shocks, for this reason, 16 shocks remain in the sample. A comprehensive overview of all shock episodes is included in Appendix A2.

Having established the shock occurrences during the sample period, I deploy CAR as a dependent variable to empirically test the validity of hypotheses 1 and 5. To determine the CAR an event-study methodology is employed. Realized stock performance around the beginning of a shock episode is compared with the expected return, based on company-specific parameters. The parameters are estimated using equation (5.1).

$$R_{i,t} = \alpha_{i,t} + \beta_{i,t}(MKT_t) + \varepsilon_{i,t} \quad (5.1)$$

$R_{i,t}$ denotes the stock return of firm i in period t. MKT_t denotes the return on the S&P 500 market index in period t. This paper operates the commonly accepted method of utilizing S&P 500 returns as a proxy for overall US market performance. The parameters alpha $\alpha_{i,t}$ and beta $\beta_{i,t}$ denote the firm's regression intercept and market exposure of firm i in period t. Epsilon $\varepsilon_{i,t}$ is the error term that captures residuals in the equation. To avoid any distortions in direct anticipation of a shock episode, coefficients alpha and beta are estimated using a market model using a window starting 200 trading days before the first day of the market shock, ending 20 trading days before the starting day of the shock episode. The abnormal returns for day t, $AR_{i,t}$ are calculated by subtracting the expected stock returns derived from the market model, from the realized return $R_{i,t}$ as in equation (5.2).

$$AR_{i,t} = (R_{i,t} - (\alpha_{i,t} + \beta_{i,t}(MKT_t)) \quad (5.2)$$

The Cumulative Abnormal Return is obtained by summing the daily abnormal returns during the event window as displayed in equation (5.3).

$$CAR_{i,s} = \sum_{t=T_0}^{t=T_1} (R_{i,t} - (ER_{i,t})) \quad (5.3)$$

The $CAR_{i,s}$ denotes the Cumulative Abnormal Return for company i during shock episode s. The event window starts 1 day before the start of a shock episode $T_0 = [t_{-1}]$. The US stock market is highly efficient and will quickly react to a market crisis. However, I choose to observe an event window ending 3 trading days after the start of the shock episode, $T_1 = [t_3]$, as the hypotheses are based on the

revaluation of elusive capital, which I believe to be less efficient than the initial market response. Although the consequence of a shock may be an endured period of market stress and uncertainty, the event period is truncated at 5 trading days to isolate the short-term shock impact.

3.2.2 Market resilience

The responsiveness to market movements, as mentioned in hypotheses 2-4 and hypotheses 6-8, will be proxied by market betas. The market beta relates to a company's systematic risk and denotes the sensitivity of a stock return to changing market returns. A beta above 1 implies a high market sensitivity and a beta below 1 suggests less correlation between market movements and stock price. Hypotheses 2 and 6 are tested by using the normal market beta, estimated over the prior 36 months. Hypotheses 3, 4, 7, and 8 are tested by using distinct market betas for upstream and downstream markets to identify if socially responsible companies behave differently during recessions and expansions. The idea of asymmetric betas was formally documented by Fabozzi and Francis (1977), who were the first to estimate separate betas for 'bull' and 'bear' markets. Woodward and Anderson (2009) further substantiate the existence of dual betas and demonstrate how market sensitivity differs over time. Employing a dual-beta model improved predictions about company and portfolio returns. It assumes separate betas for upstream and downstream markets and implies that firms' stock prices behave differently compared to the market in all phases of the business cycle, e.g. companies can be more sensitive to economic expansions compared to recessions.

First, a monthly, regular beta is estimated based using the single index market model (Fabozzi and Francis, 1977), as in equation (6.1).

$$R_{i,t} = \alpha_{i,t} + BETA_{i,t}MKT_t + \varepsilon_{i,t} \quad (6.1)$$

This is a market model analogous to the market model introduced in the previous section. $R_{i,t}$ denotes the return for firm i over month t. $\alpha_{i,t}$ is the constant value for company i over month t. $BETA_{i,t}$ denotes its accompanying beta. MKT_t is the market's performance over month t, proxied by the S&P 500, and $\varepsilon_{i,t}$ functions as the error term. The market model estimates a monthly company beta based on the relation between market and company performance over an estimation period of 36 months.

Subsequently, separate betas are estimated similarly to Fabozzi and Francis (1977) and Faff (2001). Using equation 6.2, upward (expansion) and downward (recession) market betas are estimated for associated months.

$$R_{i,t} = \alpha_{u,i}D_u + BETA_{u,i}MKT_tD_u + \alpha_{d,i}D_d + BETA_{d,i}MKT_tD_d + \varepsilon_{i,t} \quad (6.2)$$

$R_{i,t}$ denotes the return of company i in month t. $\alpha_{u,i}$, $BETA_{u,i}$, $\alpha_{d,i}$ and $BETA_{d,i}$ denote the expansion and recession alphas and associated beta values for up u and down d states for company i. This model is similar to the aforementioned market model and intends to estimate expansion and recession market

betas. MKT_t is the market's performance over month t, again proxied by the S&P 500, and D_u and D_d are dummies for expanding and recession months. To determine if months classify as expansion or recession markets, we observe the excess market return. The excess market return is calculated using equation (7).

$$EMKT_t = MKT_t - Rf_t \quad (7)$$

$EMKT_t$ denotes the excess market return in month t, where MKT_t denotes the market return during month t, proxied by the S&P 500, and Rf the risk-free rate in month t. The proxy for the risk-free rate will be the return of the 3-month Treasury Bill, a security backed by the United States government. Data on the 3-month Treasury Bill is obtained from the database of the Federal Reserve Bank of St. Louis.

When the excess market return is positive ($EMKT_t > 0$), the market is classified as an expanding economy. The dummy variable D_u is registered as 1 and D_d is attributed a value of 0. Similarly, when the excess market return is negative ($EMKT_t < 0$), the market is perceived as a recession month. D_u is then attributed a value of 0 and D_d is registered as 1. This method of defining 'bull' and 'bear' markets is mutually exclusive and collectively exhaustive, attributing an expansion or recession label to every month. This method does not account for any trend effects and is employed by both Fabozzi and Francis (1977) and Faff (2001). The market model estimates expansion betas and recession betas observing the 36 months preceding month corresponding to the beta. The sample includes 422388 normal monthly firm betas. 148147 expanding market month betas are identified and 256678 observations are defined as recession month betas. In expanding market months, firms experienced an average return of 5.46% and a beta of 1.25, and recession months averaged -1.53% with an associated beta of 1.37.

3.2.3 Optimal CSR level

Hypotheses 5-8, theorizing optimal levels of CSR engagement, implicitly assume CSR engagement exhibits a non-linear effect on the dependent variables CAR, BETA, $BETA_u$, or $BETA_d$. Testing these hypotheses requires regressions to include a quadratic component to capture non-linear effects. This quadratic component is constituted by computing a squared CSR score, requiring all CSR scores to be either positive or negative. Values of the initial CSR variable used to test hypotheses 1-4, range between -0.192 and 0.275 and average -0.005.

To enable the construction of a squared CSR variable, regular CSR scores must be corrected to all be positive. Hence, the adjusted CSR score is computed by adding 0.5 to all CSR observations. This increases the average to 0.505, obtaining only positive values between 0.308 and 0.775. $CSRadj^2$ is constructed by computing the squared value of the adjusted CSR score. The equations (8.1) and (8.2) are displayed below.

$$CSRadj = CSR + 0.5 \quad (8.1)$$

$$CSRadj^2 = CSRadj * CSRadj \quad (8.2)$$

The quadratic variable $CSRadj^2$ is used to formulate non-linear regression specifications which are employed to test hypotheses 5-8.

3.3 Regression models

The dependent variables CAR, BETA, $BETA_u$, or $BETA_d$ will be deployed in this paper to test the hypotheses. This section provides an overview of the baseline regressions and describes the variables employed. For all regressions, I employ a set of control variables to reduce the possibility of relevant firm characteristics to influence the obtained results. Similar to Lins, Servaes, and Tamayo (2017), I control for factors that influence a firm's financial health and a firm's fundamentals, and subsequently stock performance, to reduce the possibility of unobserved variables diluting the effect of CSR. I control for Cash, Leverage, and Profitability as proxies for the firm's financial strength. A firm with a strong financial position may be better suited to overcome abrupt crises and less responsive to general market movements. Additional fundamental factors potentially affecting stock returns are firm size and firm growth. Firm size is added to capture performance differences emerging from firm size. The Market-to-book ratio is operated as a proxy for the perceived growth value of a company, controlling for growth. Furthermore, as the idea of elusive capital is partially constituted on the undervaluation of intangible assets, CSR engagement may correlate with the degree of (in)tangible assets. Therefore, I control for Tangibility. For a complete synopsis of variables employed I refer to Appendix A1.

A proportion of regressions will account for industry- and crisis- or year fixed effects. Industry fixed effects are employed to control for unobserved industry characteristics correlated with crisis performance or market sensitivity. To control for these systematic differences between industries, I control for industry fixed effects. Crisis fixed effects are included to control for the different market contexts of individual crises. The market context affects shock severity, market reaction, and recovery speed and differs substantially across crises. Crisis fixed effects will help remove idiosyncratic market differences between crises and isolate the effect of CSR on Cumulative Abnormal Return. The market context during a specific crisis affects short-term returns and, therefore, I prefer specific crisis fixed effects over, less detailed, year fixed effects for regressions involving crisis Cumulative Abnormal Return as a dependent variable. Additionally, I consider that the market's composition, preferences, and performance vary over the years, resulting in market betas changing over time. The colossal technology firms (online platforms and software developers) currently constitute a considerable share of the total market. A handful of firms had a changing impact on the course of market indices in the direct aftermath of the COVID-19 market crisis in March 2020. These large firms outperformed the market, increasing the value-weighted market return of the S&P 500, while many firms were still struggling. This example,

of time-varying market composition affecting market sensitivity, advocates the inclusion of year fixed effects in the regression.

To test hypothesis 1, which assumes CSR engagement to be positively related to crisis resilience, and assess the relationship between Corporate Social Responsibility and Cumulative Abnormal Return during market crises, I perform a linear OLS regression of CAR on CSR, controlling for industry and crisis fixed effects. The regression model is displayed in regression model (1).

$$CAR = \alpha + \beta CSR + \gamma Controls + \varepsilon \quad (1)$$

Hypotheses 2-4 theorize that CSR engagement provides firms with market resilience, a decreased sensitivity to medium-term market movements. Hypothesis 2 assumes that CSR engagement lowers overall sensitivity to market movements. Hypothesis 3 assumes that CSR engagement restricts firms from pursuing potentially profitable activities, thereby lowering sensitivity to upward movements of the market during times of market expansion. Hypothesis 4 assumes that CSR engagement provides firms with resilience to downward market pressure in recession months.

Hypothesis 2, theorizing the relationship between CSR engagement and overall sensitivity to market movements, is tested using regression model 2.

$$BETA = \alpha + \beta CSR + \gamma Controls + \varepsilon \quad (2)$$

Hypothesis 3, theorizing the relation between CSR engagement and market sensitivity in expanding market months, is tested using regression model 3:

$$BETA_u = \alpha + \beta CSR + \gamma Controls + \varepsilon \quad (3)$$

Hypothesis 4, theorizing the relation between CSR engagement market sensitivity in recession months, is tested using regression model 4:

$$BETA_d = \alpha + \beta CSR + \gamma Controls + \varepsilon \quad (4)$$

For regression models 2-4, I will account for industry and year fixed effects, intending to limit multicollinearity and effects of any unobserved variables.

Hypotheses 5-8 provide an extension of hypotheses 1-4, theorizing that CSR effectiveness is strongest at an optimal CSR level. Initially, CSR engagement would be beneficial for a firm, in the form of increased resilience to crises or medium-term market movements. However, as CSR engagement surpasses an optimal level, further CSR engagement would reduce the implied benefit. Hypotheses 5-8 implicitly assume a non-linear relation between CSR engagement and dependent variables CAR, BETA, $BETA_{u,}$ or $BETA_d$. Therefore, hypothesis 5-8 include an adjusted CSR variable and an adjusted quadratic CSR variable as computed in section 3.2.3.

Hypothesis 5, theorizing that the positive relation between CSR engagement and Cumulative Abnormal Return during crisis times decreases above an optimal level of CSR, is tested using regression model (5).

$$CAR = \alpha + \beta_1 CSRadj + \beta_2 CSRadj^2 + \gamma Controls + \varepsilon \quad (5)$$

Regression model 5 controls for industry and crisis fixed effects. Hypothesis 6, theorizing that the negative relation between CSR engagement and the market beta decreases above an optimal level of CSR engagement is tested using regression model (6).

$$BETA = \alpha + \beta_1 CSRadj + \beta_2 CSRadj^2 + \gamma Controls + \varepsilon \quad (6)$$

Hypothesis 7, theorizing that the negative relation between CSR engagement and the market beta during an economic expansion decreases above an optimal level of CSR engagement, is tested using regression model (7).

$$BETA_u = \alpha + \beta_1 CSRadj + \beta_2 CSRadj^2 + \gamma Controls + \varepsilon \quad (7)$$

Hypothesis 8, theorizing that the negative relation between CSR engagement and the market beta during a recession decreases above an optimal level of CSR engagement, is tested using regression model (8).

$$BETA_d = \alpha + \beta_1 CSRadj + \beta_2 CSRadj^2 + \gamma Controls + \varepsilon \quad (8)$$

Similar to regression models 2-4, regression models 6-8 include industry and year fixed effects.

It is important to consider that the causal relation between firm financial performance and CSR engagement has been a topic of debate among researchers. It is recognized that firm performance can influence CSR and CSR can influence firms' performance. In the context of resilience, firms may be resilient as a result of their CSR engagement, or firms that are resilient engage more in CSR. This induces potential endogeneity concerns for my research. These concerns are sometimes addressed by lagging CSR scores by 1 year. I choose not to do so, as corporate decisions generally require a longer time to come into effect. In the context of CSR, the result of sustainable investments, choosing different suppliers, or diversifying the board of management takes a considerable amount of time to become effective and be recognized by the market. However, I do acknowledge that this holds potential endogeneity implications for my research.

Furthermore, Bruce Pagan tests indicate heteroskedasticity, which is corrected by the use of robust standard errors.

Also, regression specifications are subjected to analysis of Variance Inflation Factors (VIF) to signal multicollinearity in the data. No indication of problematic collinearity between the variables, signaled by a VIF in excess of 10 (Chatterjee and Hadi, 2012), is found.

3.4 Sample selection and descriptive statistics

This section describes the sample selection process and provides a synopsis of the data included in the final sample. The sample is composed of 4371 firms over the period 1991-2018, resulting in 426379 observations. The sample is unbalanced, implying an unequal number of observations per firm and industry. Several steps were taken to compose the final sample by connecting three individual databases. In the MSCI ESG KLD database, companies were identified using unique ticker code and year combinations, excluding non-identical ticker-year combinations in the process. These acquired combinations were connected to PERMNO codes using CRSP data. The PERMNO codes were used to extract yearly Compustat data and monthly and daily CRSP information. Further enhancements were motivated by data availability, company and stock requirements, and industries. The financial industry is excluded in accordance with general research standards, due to the high degree of leverage in this sector. The utilities sector is excluded due to being subjected to higher regulatory requirements. To mitigate the effect of outliers, all variables are winsorized at the 1st and 99th percentile. The complete overview of data enhancements and descriptive statistics of variables included in the final sample are displayed in Table 3.1.

Table 3.1: Summary statistics

The sample consists of 426379 observations between 1991 and 2018. The initial sample is composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 170 days and 12 months were met for CAR and BETA calculations respectively. $BETA_u$ and $BETA_d$ require 6 months of available data. 6. All variables are winsorized at the 1st and 99th percentile. A market model is employed to calculate Cumulative Abnormal Returns over event window [-1, 3] for 16 crisis episodes. The event window starts 200 trading days before and ends 20 days before the event date and uses the S&P 500 as a proxy for market return. Monthly betas are acquired by employing a market model, calculating betas based on the prior 36 months. Detailed variable definitions are enclosed in Appendix A1.

Variable	Observations	Mean	Median	Std. Dev.	Min	Max
Environment	426379	.011	0	.105	-.364	.429
Social	426379	-.002	0	.096	-.200	.333
Governance	426379	-.053	0	.163	-.571	.333
CSR	426379	-.005	0	.078	-.192	.275
CSRsum	426379	-.247	0	4.150	-10	14
CAR	20077	-.002	-.002	.065	-.208	.205
BETA	422388	1.316	1.184	.846	-.339	4.290
$BETA_u$	148147	1.250	1.153	2.014	-4.958	8.771
$BETA_d$	256678	1.368	1.202	1.208	-1.678	5.727
Cash	421454	.128	0.081	.138	.001	.703
Leverage	424972	.521	0.517	.244	.073	1.320
Profitability	426203	.065	0.084	.148	-.679	.362
Firm size	425928	14.220	14.058	1.593	10.939	18.617
Market-to-book	425772	2.050	1.594	1.382	.699	8.740
Tangibility	409064	.804	0.868	.200	.229	1

The mean scores for Social, Governance, and CSR and CSRsum are negative. A negative score indicates that for these firms, on average, the MSCI registered more concerns than strengths. In addition, all 5 CSR-related variables have medians of 0. This indicates that firms often have no strengths or concerns, indicating no exceptionally positive or poor performance. It is also possible that these firms have an equal number of strengths and concerns, crossing them out against each other. This should not impact our ability to infer sensible results from the data. The average of CAR observation is -0.002, indicating a cumulative abnormal return of -0.2% over the 5-day crisis episodes. Of all observations containing either a $BETA_u$ or $BETA_d$ value, 36.6% is defined as an expanding market month and 63.3% is defined as a recession month. Considering the majority of the sample features monthly observations after the 2007/2008 financial crisis, this appears plausible. The beta variable means are all exceeding 1. In addition to the largest US firms, the MSCI database also covers small and medium-sized firms. Smaller firms have less access to capital (Beck et al., 2007), making their investments riskier and their stock more volatile than larger firms. As the beta variables are computed using the performance relative to the S&P 500, this may explain the beta values exceeding 1. Capital constraints become more explicit in economically bad times, which can explain that recession betas on average are larger than expansion betas. Besides the CSR engagement related variables, variables do not show signs of severe or potentially impairing skewness.

Table 3.2: Industry distribution

Industry classification according to the Global Industrial Code Standard(GICS) at the Sector level (first two digits). CSR denotes the average CSR score for the full sample of observations. CAR denotes the average Cumulative Abnormal Return, calculated over event window [-1, 3] for 16 crisis episodes, per industry over the available 20077 CAR observations. Beta denotes the average market beta per industry over the available 422388 BETA observations. Observations for the subsamples of CAR and BETA share comparable distributional properties with the full sample. Detailed variable definitions are enclosed in Appendix A1.

Industry	**Sample observations**	**Firms**	**CSR**	**CAR**	**BETA**
Communication Services	19283	214	0.001	0.20%	1.29
Consumer Discretionary	81510	781	-0.002	-0.72%	1.26
Consumer Staples	26729	212	0.018	0.01%	0.78
Energy	30811	330	-0.024	-1.61%	1.33
Health Care	69107	913	-0.007	-0.20%	1.20
Industrials	79745	673	-0.011	-0.13%	1.24
Information Technology	84631	962	0.005	1.03%	1.69
Materials	30991	244	-0.019	-0.96%	1.33
Real Estate	3572	42	-0.009	0.58%	1.33
Total	426379	4371			

An overview of the industries included in the sample is provided in Table 3.2. The sample consists of 10 industries that, save Communication Services and Real Estate, each constitute between 6 and 20 percent of the total sample. Whereas observations are approximately proportionate to the number of firms in an industry, they are not distributed evenly across different industries. Furthermore, we observe divergence in relevant variables across industries. The average CSR Scores per industry are notably different (e.g. performance of Energy (-0.024) is structurally lower than the score of Consumer Staples (0.018)). Additionally, Cumulative Abnormal Return during crisis episodes differs across industries. On average, firms in the Energy sector underperform (-1.61%) during these episodes, and firms in the Consumer Staples industry increase in value during these episodes (1.03%), indicating vast differences in abnormal returns and, hence, in resilience to market shocks. The final conclusion derived from observing Table 3.2 is the presence of large deviations in market sensitivity between industries. Firms in Consumer Staples (0.78) have a beta significantly lower than that of any other industry and the return in Information Technology (1.69) is the most correlated to market movements. Resulting from consumer demand patterns, investor expectations, or financial fundamentals, we observe substantial differences in CSR engagement, CAR, and market betas between industries. To effectively capture these dynamics, fixed industry effects are employed in the regression analysis.

The correlation matrix, included as Appendix A3, is analyzed to detect any unexpected correlations between the variables employed. All values with an asterisk (*) are significant at a 5% level. The negative correlation between the three beta variables and Social, Governance, and total CSR scores may hint at support for the market sensitivity decreasing effect of CSR engagement. Additionally, we observe a sizable correlation between the different measures of CSR. A comparable degree of correlation can be observed between the beta variables BETA, $BETA_u$, and $BETA_d$. As these variables are following the same overall firm strategy (CSR) or are computed partly from overlapping input data (betas), these correlations are expected. There is no observation containing both a $BETA_u$ and $BETA_d$ estimation, hence the absence of a correlation measure between these variables.

The matrix displays a positive relationship between Environmental, Social, and total CSR performance and firm size. However, this correlation is negative for governance measures of CSR performance, implicating firms size generally enhances CSR performance. However, large firms may underperform on governance measures of CSR. Furthermore, the positive correlation between Cash and Beta variables and the negative correlation between Profitability and Beta variables are noticeable. Lastly, I observe a significant correlation between several financial firm fundamentals. An example is the correlation between Cash and Tangibility. Cash is considered a tangible asset and is therefore correlated with Tangibility. However, these correlations are neither surprising nor alarming and have no implications for the research. The correlation matrix does not indicate any variables that may impair the explanatory power of statistical analysis, allowing for progression to the analytical section of this research.

4 Empirical Results

This section describes the empirical examination of the hypotheses and reports the results of the regression analyses performed, concluding with a robustness analysis of the main results.

4.1 CSR and Cumulative Abnormal Returns

Hypothesis 1 predicts that a stock of elusive capital, becoming apparent as a result of market shocks, can strengthen a firms' performance during times of crisis. Companies with high levels of CSR would have accumulated more elusive capital and would therefore enjoy higher returns (lower losses) during periods of market adversity. The hypothesis is tested using an Ordinary Least Squares (OLS) regression model on a sample of 20077 CAR observations across 16 various crisis episodes, controlling for crisis and industry effects. All CARs are observed over a 5-day event window [-1, 3]. This methodology is largely consistent with preceding CSR literature (Waddock and Graves, 1997; Servaes and Tamayo, 2013). To correct for heteroskedasticity, all regressions include robust standard errors. Table 4.1 presents the results of regressions with CAR as the dependent variable.

The regression specifications find no significant relation between CSR and Cumulative Abnormal Return during crises. Based on hypothesis 1, we would expect a positive coefficient for CSR. Specification 1 in Table 4.1 displays the results of a model excluding any fixed effects. It reports a positive, insignificant coefficient for CAR. Most control variables are estimated as determinative for CAR in crisis times. Specification 2 displays the results of a model specification that uses fixed effects controlling for individual crisis episodes, estimating an insignificant, positive coefficient for CSR. Specification 3 introduces industry fixed effects which alter the direction of the relation, however, does not improve the significance of the variable of interest.

The coefficients in specification 1 and specification 2 are in accordance with my expectations and find a positive relation between CSR engagement and crisis Cumulative Abnormal Return. However, when employing all fixed effects in specification 3 the coefficient turns negative. Additionally, the results of these regression specifications are not significant and do not provide support for hypotheses 1. Therefore, hypothesis 1 is rejected. In contrast with theory and observations in prior literature (Schnietz and Epstein, 2005), I find CSR engagement does not hold a significant relationship with Cumulative Abnormal Return during market shocks.

Table 4.1: Linear regression of Cumulative Abnormal Return on CSR

The sample consists of 20077 crisis CAR observations between 1991 and 2018. The initial sample is composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 170 days and 12 months were met for CAR calculations. 6. All variables are winsorized at the 1st and 99th percentile. A market model is employed to calculate Cumulative Abnormal Returns over event window [-1, 3] for 16 crisis episodes. The estimation window starts 200 trading days before and ends 20 days before the event date and uses the S&P 500 as a proxy for market return. Detailed variable definitions are enclosed in Appendix A1. Employed fixed effects and the adjusted determination coefficient, Adj. R^2, are displayed below the variable coefficients. Industry fixed effects are based on the Global Industrial Code Standard (GICS) sectors. Crisis fixed effects are based on the crisis qualifications enclosed in Appendix A2. Standard errors, reported between parentheses, are adjusted for heteroskedasticity and clustered at crisis level. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Regression specification		
Variable	**(1) CAR**	**(2) CAR**	**(3) CAR**
CSR	0.0007	0.0072	-0.0009
	(0.0057)	(0.0070)	(0.0072)
Cash	0.0027	-0.0075	-0.0186*
	(0.0045)	(0.0134)	(0.0099)
Leverage	-0.0151***	-0.0167***	-0.0158***
	(0.0022)	(0.0054)	(0.0049)
Profitability	-0.0002	-0.0012	-0.0059
	(0.0043)	(0.0136)	(0.0140)
Firm size	-0.0012***	-0.0002	0.0000
	(0.0004)	(0.0016)	(0.0013)
Market-to-book	0.0036***	0.0040**	0.0040*
	(0.0004)	(0.0019)	(0.0019)
Tangibility	-0.0122***	-0.0087	0.0004
	(0.0023)	(0.0058)	(0.0038)
Constant	0.0246***	0.0102	-0.0136
	(0.0056)	(0.0218)	(0.0217)
Observations	19023	19023	19023
Adjusted R^2	0.0111	0.0114	0.0216
Crisis FE	No	Yes	Yes
Industry FE	No	No	Yes

4.2 CSR and market sensitivity

Hypothesis 2 predicts that companies with higher levels of CSR engagement portray a lower sensitivity to market movements. This reduced market sensitivity is observable from a lower beta for firms with higher levels of CSR engagement. The first element of the hypothesis is tested by employing an OLS regression model on a sample of 422388 firm month regular beta observations. I control for fixed year and fixed industry effects. Furthermore, robust standard errors are included to correct for heteroskedasticity. Table 4.2 presents the results of regressions with BETA as the dependent variable.

Table 4.2: Linear regression of BETA on CSR

The sample consists of 422388 monthly firm BETA observations between 1991 and 2018. The initial sample is composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 12 months were met for BETA calculations. 6. All variables are winsorized at the 1st and 99th percentile. Monthly betas are acquired by employing a market model, calculating betas based on the prior 36 months. Detailed variable definitions are enclosed in Appendix A1. Employed fixed effects and the adjusted determination coefficient, Adj. R^2, are displayed below the variable coefficients. Industry fixed effects are based on the Global Industrial Code Standard (GICS) sectors. Year fixed effects are based on calendar years. Standard errors, reported between parentheses, are adjusted for heteroskedasticity and clustered at year level. * and *** denote statistical significance at the 10% and 1% level, respectively.

	Regression specification		
Variable	**(1) BETA**	**(2) BETA**	**(3) BETA**
CSR	-0.2260***	-0.0147	-0.0964
	(0.0161)	(0.0799)	(0.0942)
Cash	0.6511***	0.5486***	0.3176***
	(0.013)	(0.1808)	(0.0947)
Leverage	0.1209***	0.1447*	0.2378***
	(0.0065)	(0.0809)	(0.0606)
Profitability	-0.8544***	-0.8669***	-0.9283***
	(0.012)	(0.1443)	(0.1318)
Firm size	-0.0481***	-0.0386***	-0.0384***
	(0.0009)	(0.0107)	(0.0101)
Market-to-book	-0.0214***	-0.0207	-0.0021
	(0.0012)	(0.0142)	(0.0132)
Tangibility	0.1512***	0.2358***	0.2442***
	(0.0065)	(0.0592)	(0.0455)
Constant	1.8365***	1.6339***	1.5608***
	(0.0146)	(0.1366)	(0.1625)
Observations	399500	399500	399500
Adj. R^2	0.0660	0.0577	0.1206
Year FE	No	Yes	Yes
Industry FE	No	No	Yes

As hypothesis 2 argues that CSR lowers market sensitivity, I expect a negative coefficient for CSR. Initial examination learns that all regressions estimate a negative relation between CSR and BETA, in varying degrees of significance. Specification 1 in Table 4.2 finds a highly significant and negative relationship, although does not control for fixed effects. Specification 2 includes year fixed effects and finds an insignificant negative relation. In section 3.4, I demonstrated how different industries exhibit different sensitivity to market movements. As unobserved industry effects may influence both BETA and CSR performance, I employ industry fixed effects in specification 3, finding a stronger negative,

yet still insignificant, coefficient. All regressions report a negative relation between CSR and BETA. However, including appropriate fixed effects decreases the significance of this relation. The disappearance of statistical significance after including fixed effects was similarly observed by Servaes and Tamayo (2013).

Intending to test the argumentation of Nofsinger and Varma (2014), suggesting that CSR can limit downside risk, however, may restrict upside potential, I continue the analysis by separately estimating the relation between CSR and market sensitivity in different markets. For hypotheses 3 and 4 the analysis is extended by differentiating between betas in expanding and recession markets. Both are tested using an OLS model controlling for fixed effects, on samples with expanding and recession betas with 148147 and 256678 observations respectively. The same specifications are employed as in the recession with a singular beta, save the specification without fixed effects. Robust errors are employed for all regressions, clustered at year level. Table 4.3 presents the results of regressions with $BETA_u$ and $BETA_d$ as the dependent variables.

Hypothesis 3 argues that CSR engagement lowers firms' market sensitivity in expansion months. I, therefore, expect a negative coefficient for CSR in Specifications 1 and 2 in Table 4.3, which employ $BETA_u$ as the dependent variable. Regression Specifications 1 and 2 both find a negative, although insignificant, relation between CSR and $BETA_u$ in expanding markets. Complementing hypothesis 3, hypothesis 4 theorizes that CSR engagement lowers firms' market sensitivity in recession months. Accordingly, I expect a negative coefficient for CSR in Regression Specifications 3 and 4 in Table 4.3, $BETA_d$ as the dependent variable. Specification 3 estimates a negative, insignificant relation between CSR and $BETA_d$ in recession months. Specification 4, including fixed effects for year and industry, finds a strong and negative relation between market sensitivity in recession months, significant at a 5% level.

An overall assessment of regressions employing BETA, $BETA_u$, or $BETA_d$ as the dependent variable, find negative coefficient estimation in all specifications. They suggest that CSR is negatively related to firms' market sensitivity. After employing year and industry fixed effects in regression specifications with BETA and $BETA_u$ as dependent variables, inadequate significance levels observed lead me to reject hypotheses 2 and 3. The regression with $BETA_d$ and the complete range of fixed effects finds a negative, significant relationship. This confirms hypothesis 4, theorizing that the risk-limiting aspects of CSR limit the sensitivity to downward market sentiments. These findings partially substantiate suggestions in prior research of Nofsinger and Varma (2014). The expected relation between CSR market sensitivity in general, downward, and upward markets is observed, although only statistically significant for the relationship between CSR and $BETA_d$.

Table 4.3: Linear regression of $BETA_u$ and $BETA_d$ on CSR

The sample consists of 148147 $BETA_u$ and 256678 $BETA_d$ observations between 1991 and 2018. The initial sample was composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 6 months were met for $BETA_u$ and $BETA_d$ computations. 6. All variables are winsorized at the 1st and 99th percentile. Monthly betas are acquired by employing a market model, calculating betas based on the prior 36 months. Detailed variable definitions are enclosed in Appendix A1. Employed fixed effects and the adjusted determination coefficient, Adj. R^2, are displayed below the variable coefficients. Industry fixed effects are based on the Global Industrial Code Standard (GICS) sectors. Year fixed effects are based on calendar years. Standard errors, reported between parentheses, are adjusted for heteroskedasticity and clustered at year level. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Regression specification			
Variable	**(1) $BETA_u$**	**(2) $BETA_u$**	**(3) $BETA_d$**	**(4) $BETA_d$**
CSR	-0.0818	-0.0325	-0.1810	-0.2898**
	(0.2361)	(0.2204)	(0.1087)	(0.1249)
Cash	0.2473	0.3116**	0.8199***	0.5151***
	(0.1942)	(0.1445)	(0.2192)	(0.1422)
Leverage	0.2446	0.2092*	-0.0888	0.0370
	(0.1439)	(0.1125)	(0.0928)	(0.0719)
Profitability	-0.4686**	-0.8454***	-1.0268***	-1.0379***
	(0.1813)	(0.1561)	(0.2547)	(0.2280)
Firm size	0.0128	0.0146	-0.0568***	-0.0587***
	(0.0304)	(0.0322)	(0.0133)	(0.0125)
Market-to-book	-0.0662*	-0.0274	0.0198	0.0346**
	(0.0334)	(0.0286)	(0.0187)	(0.0162)
Tangibility	0.5252***	0.2861***	0.1819	0.2127*
	(0.1663)	(0.0793)	(0.1137)	(0.1053)
Constant	0.6586	0.9004	2.0122***	1.9316***
	(0.3816)	(0.5319)	(0.1960)	(0.1717)
Observations	143468	143468	239661	239661
Adj. R^2	0.0063	0.0242	0.0491	0.0826
Year FE	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	Yes

4.3 CSR Categories

I continue by explicitly modeling the three relevant CSR categories (Environment, Social, and Governance) to estimate the idiosyncratic effects of each category. As these categories all exercise a different impact on a firm's operations and business model, the categorical specification of CSR engagement can be relevant for the observed effects. Table 4.4 presents the results of regression models with separate CSR categories as the independent variables. All specifications include fixed effects relevant to the dependent variable. The fixed effects applied are displayed below the table. Robust standards errors are employed and clustered at a crisis (Specification 1) or year (Specifications 2-4)

level. For specification 1, I expect the CSR categories to display a positive coefficient. For Specifications 2-4, I expect to observe negative coefficients for the CSR categories.

Table 4.4: Linear regression on CSR categories

The sample consists of 20077, 422388, 148147, and 256678 observations between 1991 and 2018 for CAR, BETA, $BETA_u$, and $BETA_d$, respectively. The initial sample is composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 170 days and 12 months were met for CAR and BETA calculations respectively. $BETA_u$ and $BETA_d$ require 6 months of available data. 6. All variables are winsorized at the 1st and 99th percentile. A market model is employed to calculate Cumulative Abnormal Returns over event window [-1, 3] for 16 crisis episodes. The estimation window starts 200 trading days before and ends 20 days before the event date and uses the S&P 500 as a proxy for market return. Monthly betas are acquired by employing a market model, calculating betas based on the prior 36 months. Detailed variable definitions are enclosed in Appendix A1. Employed fixed effects and the adjusted determination coefficient, Adj. R^2, are displayed below the variable coefficients. Industry fixed effects are based on the Global Industrial Code Standard (GICS) sectors. Crisis fixed effects are based on the crisis qualifications enclosed in Appendix A2. Year fixed effects are based on calendar years. Standard errors, reported between parentheses, are adjusted for heteroskedasticity and clustered at crisis or year level. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Regression specification			
	(1)	**(2)**	**(3)**	**(4)**
Variable	**CAR**	**BETA**	**$BETA_u$**	**$BETA_d$**
Environment	-0.0020	0.1143**	-0.0662	-0.0617
	(0.0070)	(0.0426)	(0.1248)	(0.0748)
Social	0.0005	-0.1609*	0.0949	-0.1731*
	(0.0077)	(0.0928)	(0.2145)	(0.0984)
Governance	-0.0021	-0.0380	-0.1798	-0.062
	(0.0070)	(0.0451)	(0.1218)	(0.0472)
Cash	-0.0186*	0.3173***	0.3100**	0.5147***
	(0.0098)	(0.0950)	(0.1445)	(0.1419)
Leverage	-0.0159***	0.2376***	0.2051*	0.0359
	(0.0048)	(0.0605)	(0.1139)	(0.0725)
Profitability	-0.0058	-0.9286***	-0.8409***	-10374***
	(0.0140)	(0.132)	(0.1549)	(0.2277)
Firm size	-0.0001	-0.0383***	0.0100	-0.0597***
	(0.0013)	(0.0108)	(0.0318)	(0.0130)
Market-to-book	0.0040*	-0.0021	-0.0267	0.0347**
	(0.0019)	(0.0131)	(0.0290)	(0.0161)
Tangibility	0.0004	0.2460***	0.2853***	0.2124*
	(0.0037)	(0.0457)	(0.0795)	(0.1056)
Constant	-0.0133	1.5573***	0.9687*	1.946***
	(0.0210)	(0.1744)	(0.5198)	(0.1762)
Observations	19023	399500	143468	239661
Adj. R^2	0.0224	0.1209	0.0245	0.0826
Crisis FE	Yes	No	No	No
Year FE	No	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

Separately specifying the three categories yields a different perspective than assessing overall CSR effects. Specification 1 finds insignificant results for all categories. The Social category shows a positive coefficient. Contrary to my expectations, Environmental and Governance show a negative coefficient. Specification 2 estimates a positive relation between Environment and BETA and a negative relation between Social and BETA, significant at a 5% and 10% level respectively. Also, it finds a negative, insignificant relation between Governance and BETA. The regression results point to CSR engagement in the Environmental category as increasing sensitivity to the market. Social CSR engagement, in contrast, is related to a lower sensitivity to market movements. The third regression specification displays a positive coefficient for the Social category. Environmental and Governance show a negative coefficient. All coefficients are highly insignificant. Regression specification 4 estimates a weakly significant negative relation between Social CSR and $BETA_d$, significant at a 10% level. It estimates insignificant, negative coefficients for Environmental and Governance. These results establish mixed support for CSR categories uniquely affecting crisis CAR and market sensitivity (BETA, $BETA_u$, or $BETA_d$). The findings indicate individual CSR categories exhibit different effects on the variables of interest, however lack the statistical significance to infer exact conclusions.

4.4 Optimal CSR engagement levels

Hypotheses 5 – 8 theorize that the effects of CSR are not evenly distributed across all levels of CSR engagement. As CSR engagement increases, it potentially loses effectiveness or increases financial constraints on the firm. The individual hypotheses on optimally effective CSR levels are tested by including a quadratic CSR component in the regression specifications, creating a non-linear regression model. Fixed effects and heteroskedasticity corrections are employed based on the dependent variable assessed, similar to preceding regressions. The results are displayed in Table 4.5.

Hypothesis 5 theorizes that the effect of CSR on Cumulative Abnormal Return during crisis times decreases above an optimal level of CSR. Initially, CSR increases crisis CAR. After surpassing a certain level of CSR, however, it decreases resilience to crises. Therefore, I expect the coefficient for CSRadj to be positive and for $CSRadj^2$ to be negative. Hypotheses 6-8 theorize that the effect of CSR on market sensitivity decreases above an optimal level of CSR. I expect the coefficient for CSRadj to be negative and for $CSRadj^2$ to be positive.

Specification 1 in Table 4.5 estimates CSRadj to be negative and $CSRadj^2$ to be positive and contradicts my expectations. Therefore, I reject hypothesis 5. Specifications 2-4 all estimate a positive coefficient for CSRadj and a negative coefficient for $CSRadj^2$. These estimations contradict my initial expectations, as the direction of these relationships is opposite to the direction I expected to find. This implies BETA, $BETA_u$, and $BETA_d$ initially increase with CSR levels and decrease only after a particular level of CSR. For specification 2, the estimated coefficients for the relationship between CSRadj and $CSRadj^2$ with

BETA are significant at a 5% and 1% level. As the estimated coefficients are opposing my expectations, I reject hypothesis 6.

Table 4.5: Non-linear regression on CSR

The sample consists of 20077, 422388, 148147, and 256678 observations between 1991 and 2018 for CAR, BETA, $BETA_u$, and $BETA_d$, respectively. The initial sample is composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 170 days and 12 months were met for CAR and BETA calculations respectively. $BETA_u$ and $BETA_d$ require 6 months of available data. 6. All variables are winsorized at the 1st and 99th percentile. A market model is employed to calculate Cumulative Abnormal Returns over event window [-1, 3] for 16 crisis episodes. The estimation window starts 200 trading days before and ends 20 days before the event date and uses the S&P 500 as a proxy for market return. Monthly betas are acquired by employing a market model, calculating betas based on the prior 36 months. The adjusted CSR measure is computed by adding 0.5 to all CSR observations, obtaining all positive values between 0.308 and 0.775. $CSRadj^2$ is the squared value of adjusted CSR. Detailed variable definitions are enclosed in Appendix A1. Employed fixed effects and the adjusted determination coefficient, Adj. R^2, are displayed below the variable coefficients. Industry fixed effects are based on the Global Industrial Code Standard (GICS) sectors. Crisis fixed effects are based on the crisis qualifications enclosed in Appendix A2. Year fixed effects are based on calendar years. Standard errors, reported between parentheses, are adjusted for heteroskedasticity and clustered at crisis or year level. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Regression specification			
Variable	**(1) CAR**	**(2) BETA**	**(3) $BETA_u$**	**(4) $BETA_d$**
CSRadj	-0.0073	1.1614**	4.0471***	0.6156
	(0.0874)	(0.4464)	(1.0864)	(0.6619)
$CSRadj^2$	0.0062	-1.2056***	-3.8368***	-0.8779
	(0.0845)	(0.4282)	(1.075)	(0.6370)
Cash	-0.0186*	0.3199***	0.3170**	0.5171***
	(0.0098)	(0.0948)	(0.1444)	(0.1426)
Leverage	-0.0158***	0.2407***	0.2153*	0.0394
	(0.0048)	(0.0604)	(0.1115)	(0.0712)
Profitability	-0.0059	-0.9317***	-0.8576***	-1.04***
	(0.0140)	(0.1321)	(0.1582)	(0.2285)
Firm size	0.0000	-0.0363***	0.0205	-0.0572***
	(0.0014)	(0.0105)	(0.0338)	(0.0128)
Market-to-book	0.0040*	-0.0029	-0.0292	0.0341**
	(0.0019)	(0.0131)	(0.0285)	(0.0161)
Tangibility	0.0003	0.2462***	0.2910***	0.2143*
	(0.0038)	(0.0453)	(0.0794)	(0.1054)
Constant	-0.0151	1.8376***	1.7976***	2.1326***
	(0.0243)	(0.1496)	(0.376)	(0.2219)
Observations	19023	399500	143468	239661
Adj. R^2	0.0223	0.1208	0.0247	0.0827
Crisis FE	Yes	No	No	No
Year FE	No	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

Specification 2 reveals that BETA initially increases with CSR engagement, reaching a maximum for observations with a CSR performance slightly above average and decreasing at a growing rate for firms with higher levels of CSR engagement. A comparable relation is observed for $BETA_u$, as specification 3 coefficient estimates for CSRadj and $CSRadj^2$ are significant at a 1% level. Again, as these estimations oppose my hypothesis and the expected direction of the relation, I reject hypothesis 7. Although the exact interpretation of coefficients proves difficult due to the adjustments for modeling purposes, I infer that $BETA_u$ initially increases with CSR and decreases it after a certain level of CSR. Specification 4 finds similar coefficient directions as specifications 2 and 3. As the estimated relationships are insignificant, I reject hypothesis 8.

4.5 Robustness analysis

The results of this research rely on assumptions regarding calculations of Corporate Social Responsibility scores, Cumulative Abnormal Return construction, and beta estimations. To ensure the results are not fundamentally affected by inaccuracies and alleviate concerns about potentially incorrect assumptions, this section reports several alternative regressions, testing the robustness and validity of the main results. These alternative regressions use different measures for CSR, CAR, and dual betas.

First, an alternative CSR measure is employed as the variable of interest. As argued in section 3, employing a proportional CSR engagement variable provides an advantage over employing an absolute, summed score. To test whether the chosen methodology of measuring CSR engagement impacts the obtained results, the proportional CSR score is substituted by the absolute CSR score, CSRsum. This summed CSR score is dependent on the number of variables inspected or rated by MSCI and potentially provides another perspective. The results of this check are displayed in Appendix A4. Regression specifications 1-3 yield low and insignificant coefficients for the effect of CSR on CAR, BETA, and $BETA_u$. Specification 4 estimates a highly significant negative relation between CSR and $BETA_d$, reconfirming hypothesis 4.

Secondly, we address the method of crisis identification. Initially, CARs were computed during 16 crisis episodes over event window [-1, 3]. These crisis episodes were identified as periods with adverse market conditions and high levels of expected market volatility, implying market unrest. This method ensured equal requirements for crisis classification and produced comparable Cumulative Abnormal Returns. However, this method also identified crisis episodes where the average Cumulative Abnormal Return positive. Appendix A2 indicates that for 5 identified crises, companies in the sample on average displayed a positive CAR during the observed event period, and hence not correctly correspond with a crisis. To prevent the chosen crisis identification procedure to cause misrepresentation or biased results, we exclude crisis episodes that have positive Cumulative Abnormal Returns and model CAR [-1, 3] of the remaining crises as the dependent variable. The results of this regression are presented in Appendix A5. Regression specification 1 shows a negative coefficient, significant at a 10% level, and is

contrasting my expectations about resilience. When controlling for the individual nature of crises by using fixed crisis effects, I obtain a positive coefficient in specification 2. However, after controlling for industry fixed effects, specification 3 yields a negative relation between CSR and crisis CAR. When controlling for potentially identified non-crisis episodes, I find alternating directions of effects and low significance of the results. Therefore, results on the crisis-resilient properties of CSR engagement remain inconclusive, again providing no support for hypothesis 1.

Finally, I apply stricter criteria to the required number of months for beta estimations. Betas for expanding and recession markets required a minimum of 6 months of data from corresponding market states in the prior 36 months to be included as a valid calculation. The stricter specification excludes all beta calculations with fewer than 12 corresponding months in the observed 36 months. Subsamples of 109428 $BETA_u$ observations and 219790 $BETA_d$ observations remain. The results of regressions 1-4 are enclosed in Appendix A6. The regressions yield comparable coefficients and significance levels, although all model specifications possess higher explanatory value. Regressions 1-3 estimate a negative, although insignificant relations between CSR and market sensitivity. Regression 4, controlling for firm and industry effects, finds a negative coefficient for CSR, significant at a 5% level. This reaffirms the relation between CSR and market sensitivity during recession months and supports the conclusion on hypothesis 4.

The robustness checks report results that are largely comparable with the main results of the initial regressions. I observed contrasting results on one regression after employing alternative CAR computations. Nonetheless, this occurred in the specification without fixed effects and the results do not invalidate the rejection of hypothesis 1. Overall, the analyses provide evidence that results are robust to alterations in CSR assessment and BETA requirements. Coefficient estimations and explanatory value tends to vary over model specifications, although the directions of relations and implications for hypothesis 4 remain. The robustness tests find conclusions comparable to the main results and I confirm that hypothesis 4 is robust to changes in both CSR and beta computation.

5 Conclusion

This research aims to assess if CSR enhances firm resilience in the short and medium-term by assessing, provided by competencies coming to the surface in times of adverse market conditions. This section discusses the results observed, assesses potential limitations to these results, and suggests implications for both business and academics.

5.1 Discussion of results

Contrary to the expectations formed following theory, CSR is not established as a method of acquiring resilience against abrupt market crises. Regressions with various model specifications do not imply elusive capital to exhibit the hypothesized effect on resilience in the short term. Significant relationships are absent after the inclusion of fixed effects and hypothesis 1 is rejected. This paper, therefore, fails to find support for the crisis-resilient properties of CSR engagement and related outperformance of companies with high levels of CSR engagement during crises, unexpectedly opposing the research of Schnietz and Epstein (2005), who found evidence for CSR enhancing crisis resilience during the crisis following the Seattle World Trade Organization failure in 1999. By manually selecting the crisis and event window for a single occurrence they successfully isolate the effects of CSR. After attempting to extend their analysis over 16 crisis episodes, I cannot confirm the theory on the appearance of elusive capital during crises and do not find evidence for CSR enhancing short-term resilience. Performing an additional analysis using only crisis episodes with a negative Cumulative Abnormal Return did not alter this perspective. This may indicate that the crisis selection procedure employed in this paper was not accurate enough to capture the relation found by Schnietz and Epstein (2005).

On the effects of CSR on market resilience, the results are more in line with expectations. Hypothesis 2 was rejected, not observing a significant relation between CSR and regular beta. After observing betas in expansion and recession periods separately, I cannot conclude CSR reduces market sensitivity in expansion periods, rejecting hypothesis 3. However, I conclude CSR consistently exhibits a negative effect on the beta in months classified as recession months, confirming hypothesis 4. This implies that in months of poor market performance, high CSR engagement generally entails a lower sensitivity to the market. Responsible firms are therefore less affected by adverse market conditions and enjoy a degree of resilience to market movements. This finding remains apparent and significant after multiple robustness checks. CSR is not found to have a significant effect on normal or expanding market betas.

Assessing hypotheses on optimal CSR effects, I find no significant relation between CSR and crisis Cumulative Abnormal returns nor $BETA_{d,}$ and hence hypotheses 5 and 8 are rejected. The non-linear model with BETA as the dependent variable yields results that contradict my initial expectations. I expected that market sensitivity would decrease with CSR levels, and only for firms with the highest levels of CSR engagement, surpassing an optimal point, the marginal effect of CSR on beta would be

positive. However, I find that BETA, when estimated irrespective of market states, is highest for firms with levels of average levels of CSR engagement. When companies move away from average CSR engagement levels, market sensitivity decreases. Furthermore, I find a stronger relationship with the same direction between CSR and $BETA_u$, indicating this effect is primarily expressed in upmarket months, where firms with CSR levels slightly above average have the highest market betas. For both BETA and $BETA_u$, firms in the lowest and the highest segments of CSR engagement experience lower market exposure. As this effect is stronger in expansion months, this potentially obstructs these firms from 'riding the wave' during growth markets.

In the context of medium-term market sensitivity, I find results that support the hypothesized limited downside risk of firms with high CSR engagement in recession markets. However, in the context of an optimal CSR level, I find seemingly opposing results indicating market sensitivity decreases only after an 'anti-optimal' level of CSR engagement. Initially, these results contradict my expectations. However, combining them with the results on the linear relation between CSR and $BETA_d$, the results can be in agreement with the observations of Nofsinger and Varma (2014). The risk-limiting aspects of CSR lower the exposure to downward market movements. Contrastingly, CSR engagement seemingly increases market sensitivity at lower levels. However, when firms surpass a certain level of CSR engagement, the constraining aspects of CSR lower a firm's sensitivity to market movements. This effect appears to be more substantial during times of economic expansion. If firms pass a particular level of CSR, the degree to which a firm benefits from expanding market sentiments decreases, indicating they are excessively engaged in CSR.

When CSR levels are not in upper or lower bounds, their ability to benefit from expanding markets is not substantially impaired. This implies that for firms with above average, non-extreme CSR levels, they profit from both resilience effects during resilience periods and the potential to benefit from expansion periods. However, for firms with remarkably low or high levels of CSR engagement, the constraining aspects of (not) engaging in CSR prevent them to effectively benefit from expanding markets. An unexpected observation is that firms with the lowest level of CSR also exhibited a low level of sensitivity to expanding markets. This indicates that firms with bad CSR performance are neither resilient to recession markets, nor do they benefit from expanding markets.

Additionally, this research briefly touches upon the effects exhibited by different CSR categories. Despite this research only yielding results with limited significance, it hints that social CSR engagement reduces market sensitivity and environmental CSR increases market exposure. Social CSR is found to potentially be a stabilizing factor, decreasing exposure to market sentiments in normal and downward market betas, while environmental CSR increases the regular beta. This resonates with comparable findings of Hillman and Keim (2001), stating that CSR related to stakeholder relationships positively impacts company value and while addressing issues not directly related to stakeholders did not**.** On the

grounds of limited significance, I consider these results to be indicators for potential further research rather than standalone conclusions.

This research fails to expand the current literature by finding support for the crisis resilient properties of CSR. This either implies that CSR does not build elusive capital stocks and enhance resilience, or that the market cannot assess CSR information appropriately in a short-term time window observed. Furthermore, I find that firms with high levels of CSR engagement have an advantage in recession markets. The resilience to downward market pressure observed in a medium-term window provides support for the existence of elusive capital. While the market appears to reward CSR engagement in recession times, it appears to penalize firms with high levels of CSR engagement during expansion times. The effect of CSR is only observable in the medium term and not in the short term, which implies that investors do not integrate CSR information at the same speed as information on financial fundamentals.

The indication that that CSR provides a degree of resilience against systemic risk during recession months, contributed to current literature the perspective that CSR presents companies with an advantage during distressing market conditions. This paper complements prior CSR literature by specifically focusing on market sensitivity in the short and medium run and provides further insight and on the performance and value increasing mechanisms of CSR. I extend the analysis of Schnietz and Epstein (2005), by observing the relation between CSR and crisis resilience over 16 identified crisis episodes. Furthermore, to the best of the author's knowledge, it is the first paper to combine Corporate Social Responsibility performance with a dual beta market model. Employing a dual beta model provides a new perspective to CSR and market dynamics by separately assessing expansion and recession periods. Whereas other authors (Nofsinger and Varma, 2014; Lins, Servaes and Tamayo, 2017) assessed performance and CSR in the context of crisis and non-crisis periods, this research's unique contribution to the literature is specifically assessing the effect of CSR on market sensitivity in different economic states, by employing upward and downward market betas.

5.2 Limitations

Limitations to the observed results are recognized, arising from assumptions, data selections, and variable calculations.

The conclusions on resilience during crises depend on the correct classification of crisis episodes. Appendix A2 indicates that several crisis episodes experience positive cumulative abnormal returns. Additionally, the benchmark measure used resulted in episodes that could not directly be linked to a crisis. This research has performed additional robustness analyses to correct for these limitations. However, these observations point to imperfect classification of crisis episodes, which could limit the reliability of the result obtained. A qualitative determination of the exact start of crises would

potentially improve the assessment and the empirical validity of the relationship between CSR and crises. This paper finds no relationship between CSR and cumulative abnormal returns employing this crisis qualification methodology. As these results contradict the findings of Schnietz and Epstein (2005), further research employing a qualitative method of crisis identification could focus on addressing this inconsistency.

Another determinant of this research is the weighted CSR score. It is composed by weighting different CSR categories proportionally to the number of items scored by MCSI. This method implicitly assumes that all scored items have a comparable effect on crisis resilience in terms of size, which is unrealistic given the different nature of items assessed. It assumes that for example, for all firms in the sample, efforts to integrate renewable energy have an equal effect on firm value as having a diverse board of directors. With the means available for this research, this method provides the best possible proxy for companies' CSR engagement and enable comparability over an unbalanced MSCI dataset. Other researchers have used different methods, including an independent panel of experts, rating the appropriate weighting of different categories. The methodology of measuring CSR performance is fundamental to research and, while it can be used to indicate the direction of relations, accurate interpretation of the results by business and academics is challenging. A more sophisticated CSR engagement score would facilitate better interpretation of the results obtained than a rough proxy variable, enabling to draw more exact relations, instead of mere directions of relations.

Additionally, this research employs a relatively simple market model to calculate abnormal returns and market betas. Therefore, all results in this research are subjected to the validity of the estimations from these market models. However, despite some researchers employing different models, as the Fama-French multi-factor model, the methodology employed in this research is a common practice among other academics, indicating a degree of trustworthiness, and was effective for the purpose of this paper.

Finally, the selection criteria of this paper limit the generalizability of the results. The sample consists only of US domestic firms, which generally have higher levels of institutional ownership. While proportional institutional holdings are excluded by other scholars as a significant determinant for CSR engagement (Graves and Waddock, 1994), institutional ownership may impact selling decisions and therefore crisis response. Potentially, institutional investors may be subjected to loss-limiting pressure during a crisis or hold a different perspective on the value of CSR than individuals investors. These and additional market characteristics of the United States may limit the generalizability of the research outside the sample.

5.3 Implications

Implications for business

The findings of this research hold informational value for both investors and firms. From the investor perspective, it may be beneficial to invest in firms with high CSR engagement during expected economic downturns. I demonstrated that firms with high CSR engagement on average carry lower systemic risk and are less sensitive to recession market movements than firms with low CSR ratings. The better performance in adverse markets comes at a price; companies with high levels of CSR yield lower market betas in good times. The contradicting effects observed in this research result in a delicate balance for investors and call for the explicit inclusion of CSR in portfolio management strategies, serving as a signal for underlying risk factors and explains firms and portfolio systemic risk during recession periods. From a firm perspective, this paper provides grounds to get engaged in CSR initiatives. Particularly for firms with a poor CSR performance, increased CSR engagement can build resilience against adverse markets while increasing exposure to expansion markets. For these firms, this research provides justification for CSR to shareholders and investors. For firms with CSR levels already above average, the balance is more delicate. Further CSR engagement is generally related to a lower sensitivity to growth markets, although it also increases resilience to recession markets.

Additionally, this paper underlines the value of a standardized CSR measure. The current reporting of CSR performance is done according to various accounting standards. These accounting standards have different perspectives and focus areas and are being embraced by different groups of companies. The limited degree of standardization burdens comparability over industries and countries and interpretability for investors and researchers. This research complements a growing body of literature assessing and observing the relevance of CSR in business, by displaying the value of CSR in recession markets. The value that adequate CSR information can convey to investors, should be the fundamental reason for businesses to become involved with CSR assessment and measurement. It calls for industry regulators to standardize CSR assessment and monitoring and stresses the incentive to become involved with and support a universal CSR metric, particularly for firms with high levels of CSR engagement. Academics and business have a joint interest in a universal, comparable measure of CSR, integrated into accounting standards. This requires a combined effort of involved parties and will realize merits in both directions, aiding both investment decisions and academic research in the field of Corporate Social Responsibility.

Implications for academics

To conclude, the results hold several implications for academics and areas of further research. Four future directions rise from my results. First, this research was constrained by the selected sample, limiting the generalizability of the results. By performing this research on an expanded sample, the

results can be examined in an international context. Additionally, by employing an alternative method of crisis classification, researchers can ensure that the event windows observed correctly monitor market shocks. Furthermore, this research estimated opposing effects of different CSR categories on market sensitivity**.** These results reconfirm the findings of prior research about the dynamics of CSR categories and company performance (Hillman and Keim, 2001). It implies complicated interactions between CSR categories and poses the question of why categories increase or decrease market sensitivity. A potential area for further research is that of CSR categories in a resilience context, employing a more sophisticated weighing and scoring procedure, as the procedure used by Graves and Waddock (1994). Finally, it is remarkable that CSR, as observed in this research and other literature (Nofsinger and Varma, 2014; Lins, Servaes and Tamayo, 2017), is found to provide medium-term market resilience and does not affect crisis resilience in the short run. The observations from Servaes and Tamayo (2013), finding a strong relation between the effectiveness of CSR engagement and market awareness, indicate this is potentially caused by the abundance of financial information and inadequate availability of CSR information to be used in trading models. To test this assumption, further research should assess if the relation between CSR and firm resilience changes using higher-frequency social responsibility data.

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Appendices

Table A1: Variable definitions

Variable name	Description	Computation	Derived from
Dependent variables			
CAR	Cumulative Abnormal Return over the event period [-1, 3]	Section 4.2.1	CRSP
BETA	Market responsiveness	Section 4.2.2	CRSP
$BETA_u$	Market responsiveness during an expanding economy	Section 4.2.2	CRSP
$BETA_d$	Market responsiveness during recession periods	Section 4.2.2	CRSP
Company characteristics			
CSR	Corporate Social Responsibility score	Section 4.1.3	MCSI ESG KLD Database
CSRsum	Summed Corporate Social Responsibility score	Section 4.1.3	MCSI ESG KLD Database
Cash	Available cash reserve as a proportion of total assets	Total cash / book value of assets	Lins, Servaes and Tamayo (2017)
Leverage	Debt as a proportion of total assets	Total liabilities / book value of assets	Lins, Servaes and Tamayo (2017)
Profitability	Profitability of business operations	Operating income / book value of assets	Lins, Servaes and Tamayo (2017)
Firm size	Market capitalization of firms	Natural logarithm of equity market capitalization (total shares outstanding*price at the start of the year)	Barnea and Rubin (2010), Lins, Servaes and Tamayo (2017)
Market-to-book	Market valuation of firm compared to the book value of assets	(Book value of assets + market capitalization – book value of equity) / book value of assets	Barnea and Rubin (2010)
Tangibility	Tangible assets as a proportion of total assets	Tangible assets / book value of assets	Literature review
Robustness			
CARadj	Cumulative Abnormal Return over the adjusted event period [-2, 2]	Section 4.2.1	CRSP
CSRadj	Adjusted CSR score for enabling non-linear estimations	Section 3.2.3	MCSI ESG KLD Database
$CSRadj^2$	Exponential CSR term for enabling non-linear estimations	Section 3.2.3	MCSI ESG KLD Database

Table A2: Identified shock episodes

Cumulative Abnormal Return computed over identified crisis episodes for event window [-1, 3]. Crises are classified as periods with exceedance of a benchmark VIX value for 5 consecutive days. The fifth day constitutes the event day [t = 0]. The benchmark value employed is the moving average over the 100 preceding trading days, adding two standard deviations. 20 events were identified during the period 1991-2018. When the CAR computations for several crisis episodes shared overlapping estimation periods, the second occurring crisis was excluded from the sample. 4 crises were excluded and 16 crises were analyzed. The average Cumulative Abnormal Return is calculated over all available observations in the final sample.

Event date	Start event period	End event period	Market adversity	Average Cumulative Abnormal Return
05/10/1992	02/10/1992	08/10/1992	The shock was preceded by Black Wednesday	-0.06%
29/03/1994	28/03/1994	04/04/1994	US Bond Market crisis	-2.53%
26/02/1996	23/02/1996	29/02/1996	No identifiable crisis	0.26%
06/03/1996	11/03/1996	05/03/1996	No identifiable crisis	Excluded
27/10/1997	24/10/1997	30/10/1997	A stock market crash resulting from the Asian financial crisis	-1.74%
27/08/1998	26/08/1998	01/09/1998	A stock market crash resulting from the Russian Financial Crisis	-1.96%
30/09/1998	29/09/1998	05/10/1998	Falling dollar and concerns about global stock markets	Excluded
07/09/2001	06/09/2001	19/09/2001	September 11 attacks	-3.42%
10/07/2002	09/07/2002	15/07/2002	A stock market downturn, technology bubble, September 11 attacks	-0.30%
01/08/2002	31/07/2002	06/08/2002	A stock market downturn, technology bubble, September 11 attacks	Excluded
17/05/2006	16/05/2006	22/05/2006	Middle East Financial Market crash	-0.32%
05/06/2006	02/06/2006	08/06/2006	Selloff after concerns about interest rate increases by Federal Reserve	Excluded
26/07/2007	25/07/2007	31/07/2007	Spike in perceived credit risk, TED Spread	-0.38%
15/09/2008	12/09/2008	18/09/2008	Financial Crisis 2007-2008	1.69%
14/05/2010	13/05/2010	19/05/2010	European Sovereign debt crisis after the downgrading of Greece's sovereign debt	0.05%
27/07/2011	26/07/2011	01/08/2011	European Sovereign debt crisis in Spain and Italy, fear of contagion	-0.20%
09/10/2014	08/10/2014	14/10/2014	Shock preceding October 2014 flash crash	1.13%
21/08/2015	20/08/2015	26/08/2015	General Stock Market Selloff	0.71%
29/01/2018	26/01/2018	01/02/2018	Unrest cryptocurrency market	-0.97%
17/12/2018	14/12/2018	20/12/2018	China Trade war, rising interest rates	-1.29%

Table A3: Pairwise correlation matrix

Matrix of pairwise correlation coefficients between relevant variables. An asterisk (*) denotes a significance level of 5%.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Environment	1.000													
(2) Social	0.265*	1.000												
(3) Governance	0.077*	0.127*	1.000											
(4) CSR	0.525*	0.914*	0.379*	1.000										
(5) CAR	0.018*	-0.015*	0.000	-0.005	1.000									
(6) BETA	0.005*	-0.084*	-0.005*	-0.069*	0.071*	1.000								
(7) $BETA_u$	0.011*	-0.012*	-0.011*	-0.006*	-0.020	0.466*	1.000							
(8) $BETA_d$	0.002	-0.053*	0.014*	-0.041*	0.063*	0.689*		1.000						
(9) Cash	0.037*	-0.058*	0.010*	-0.037*	0.050*	0.158*	0.023*	0.172*	1.000					
(10) Leverage	-0.013*	0.047*	-0.066*	0.019*	-0.069*	-0.010*	0.030*	-0.062*	-0.267*	1.000				
(11) Profitability	0.042*	0.109*	-0.030*	0.096*	-0.017*	-0.207*	-0.042*	-0.181*	-0.297*	-0.012*	1.000			
(12) Firm size	0.109*	0.376*	-0.173*	0.298*	-0.016*	-0.166*	-0.007*	-0.137*	-0.209*	0.179*	0.291*	1.000		
(13) Market-to-book	0.032*	0.079*	-0.012*	0.071*	0.079*	0.004*	-0.024*	0.059*	0.334*	-0.084*	-0.118*	0.196*	1.000	
(14) Tangibility	-0.082*	-0.037*	0.038*	-0.042*	-0.017*	0.081*	0.045*	0.054*	0.230*	-0.088*	-0.116*	-0.136*	0.130*	1.000

Table A4: Linear regression of alternative CSR score

The sample consists of 20077, 422388, 148147, and 256678 observations between 1991 and 2018 for CAR, BETA, $BETA_u$, and $BETA_d$, respectively. The initial sample is composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 170 days and 12 months were met for CAR and BETA calculations respectively. $BETA_u$ and $BETA_d$ require 6 months of available data. 6. All variables are winsorized at the 1st and 99th percentile. A market model is employed to calculate Cumulative Abnormal Returns over event window [-1, 3] for 16 crisis episodes. The estimation window starts 200 trading days before and ends 20 days before the event date and uses the S&P 500 as a proxy for market return. Monthly betas are acquired by employing a market model, calculating betas based on the prior 36 months. Detailed variable definitions are enclosed in Appendix A1. Employed fixed effects and the adjusted determination coefficient, Adj. R^2, are displayed below the variable coefficients. Industry fixed effects are based on the Global Industrial Code Standard (GICS) sectors. Crisis fixed effects are based on the crisis qualifications enclosed in Appendix A2. Year fixed effects are based on calendar years. Standard errors, reported between parentheses, are adjusted for heteroskedasticity and clustered at crisis or year level. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Regression specification			
Variable	**(1) CAR**	**(2) BETA**	**(3) $BETA_u$**	**(4) $BETA_d$**
CSRsum	0.0000	-0.0024	0.0000	-0.0053***
	(0.0001)	(0.0015)	(0.0045)	(0.0018)
Cash	-0.0186*	0.3176***	0.3115**	0.5151***
	(0.0099)	(0.0947)	(0.1444)	(0.1423)
Leverage	-0.0158***	0.2372***	0.2092*	0.0362
	(0.0049)	(0.0608)	(0.1126)	(0.0719)
Profitability	-0.0059	-0.9278***	-0.8452***	-1.0374***
	(0.0140)	(0.1316)	(0.1562)	(0.2279)
Firm size	-0.0001	-0.0382***	0.0139	-0.0592***
	(0.0013)	(0.0099)	(0.0313)	(0.0123)
Market-to-book	0.0040*	-0.0021	-0.0272	0.0349**
	(0.0019)	(0.0132)	(0.0287)	(0.0162)
Tangibility	0.0003	0.2447***	0.2854***	0.2128*
	(0.0038)	(0.0456)	(0.0798)	(0.1053)
Constant	-0.0129	1.5571***	0.9113*	1.9375***
	(0.0215)	(0.1601)	(0.5192)	(0.1704)
Observations	19023	399500	143468	239661
Adj. R^2	0.0223	0.1207	0.0243	0.0827
Crisis FE	Yes	No	No	No
Year FE	No	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

Table A5: Linear regression of CAR excluding non-crisis episodes

The sample consists of 12171 firm CAR observations between 1991 and 2018. The initial sample is composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 170 days were met for CAR calculations. 6. All variables are winsorized at the 1st and 99th percentile. A market model is employed to calculate Cumulative Abnormal Returns over event window [-1, 3] for 11 crisis episodes. The estimation window starts 200 trading days before and ends 20 days before the event date and uses the S&P 500 as a proxy for market return. Detailed variable definitions are enclosed in Appendix A1. Employed fixed effects and the adjusted determination coefficient, Adj. R^2, are displayed below the variable coefficients. Industry fixed effects are based on the Global Industrial Code Standard (GICS) sectors. Crisis fixed effects are based on the crisis qualifications enclosed in Appendix A2. Standard errors, reported between parentheses, are adjusted for heteroskedasticity and clustered at crisis level. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Regression specification		
Variable	**(1) CAR**	**(2) CAR**	**(3) CAR**
CSR	-0.0120*	0.0070	-0.0018
	(0.0072)	(0.0147)	(0.0127)
Cash	0.0152**	0.0062	-0.0102
	(0.0059)	(0.0141)	(0.0090)
Leverage	-0.0171***	-0.0168*	-0.0129*
	(0.0029)	(0.0087)	(0.0063)
Profitability	0.0097*	0.0047	0.0046
	(0.0054)	(0.0192)	(0.0146)
Firm size	0.0015***	0.0025	0.0023
	(0.0005)	(0.0019)	(0.0016)
Market-to-book	0.0016***	0.0022	0.0023
	(0.0005)	(0.0022)	(0.0022)
Tangibility	-0.0090***	-0.0064	0.0040
	(0.0028)	(0.0081)	(0.0054)
Constant	-0.0195***	-0.0365	-0.0530
	(0.0069)	(0.0242)	(0.0307)
Observations	11405	11405	11405
Adj. R^2	0.0092	0.0118	0.0346
Crisis FE	No	Yes	Yes
Industry FE	No	No	Yes

Table A6: Linear regression of CSR on dual betas employing stricter data requirements

The sample consists of 143468 $BETA_u$ and 239661 $BETA_d$ observations between 1991 and 2018. The initial sample was composed of MSCI KLD ESG Stats, Compustat, and CRSP databases. The final sample is subject to the following criteria: 1. Data availability on both CRSP and Compustat. 2. Publicly-traded U.S. securities with a CRSP stock code of 10 or 11. 3. Firms' availability of CSR scores in the MSCI database. 4. The firm is not in the financial or utilities sector. 5. Minimum requirements of data availability of 12 months were met $BETA_u$ and $BETA_d$ computations. 6. All variables are winsorized at the 1st and 99th percentile Monthly betas are acquired by employing a market model, calculating betas based on the prior 36 months. Detailed variable definitions are enclosed in Appendix A1. Employed fixed effects and the adjusted determination coefficient, Adj. R^2, are displayed below the variable coefficients. Industry fixed effects are based on the Global Industrial Code Standard (GICS) sectors. Year fixed effects are based on calendar years. Standard errors, reported between parentheses, are adjusted for heteroskedasticity and clustered at year level. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Regression specification			
Variable	**(1) $BETA_u$**	**(2) $BETA_u$**	**(3) $BETA_d$**	**(4) $BETA_d$**
CSR	-0.1764	-0.1027	-0.1537	-0.2615**
	(0.2250)	(0.2275)	(0.1071)	(0.1263)
Cash	0.1727	0.2197	0.8872***	0.5544***
	(0.1681)	(0.1243)	(0.2214)	(0.1379)
Leverage	0.2129**	0.1968**	-0.0881	0.0568
	(0.0923)	(0.0653)	(0.0972)	(0.0743)
Profitability	-0.6610***	-0.9690***	-1.1658***	-1.1553***
	(0.1669)	(0.1682)	(0.2587)	(0.2299)
Firm size	0.0111	0.0105	-0.0507***	-0.0533***
	(0.0189)	(0.0220)	(0.0127)	(0.0122)
Market-to-book	-0.0411	-0.0037	0.0224	0.0382**
	(0.0270)	(0.0232)	(0.0185)	(0.0157)
Tangibility	0.4561***	0.2673***	0.1816	0.2127*
	(0.1430)	(0.0766)	(0.1069)	(0.1045)
Constant	0.7831***	1.0226**	1.9244***	1.8486***
	(0.2515)	(0.4099)	(0.1693)	(0.1738)
Observations	109428	109428	219790	219790
Adj. R^2	0.0106	0.0348	0.0644	0.1090
Year FE	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	Yes