

Accepted Manuscript

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PII: S0929-1199(17)30712-5
DOI: doi:[10.1016/j.jcorpfin.2018.07.004](https://doi.org/10.1016/j.jcorpfin.2018.07.004)
Reference: CORFIN 1388
To appear in: *Journal of Corporate Finance*
Received date: 26 November 2017
Revised date: 29 June 2018
Accepted date: 21 July 2018

Please cite this article as: Bonnie Buchanan, Cathy Xuying Cao, Chongyang Chen , Corporate social responsibility, firm value, and influential institutional ownership. Corfin (2018), doi:[10.1016/j.jcorpfin.2018.07.004](https://doi.org/10.1016/j.jcorpfin.2018.07.004)

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Corporate Social Responsibility, Firm Value, and Influential Institutional Ownership

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Keywords: Corporate social responsibility; ESG; firm value; corporate governance; financial crisis.

JEL classification: D22; G34; M14

Acknowledgements: The authors wish to thank participants at the 2018 FMA International Meetings, Kristiansand, Norway, 2018 SWFA Meetings, Albuquerque, 2017 Behavioral Finance Working Group Workshop, London; Hanken School of Economics research seminar participants, Danial Hemmings, Eva Liljebloom, Danika Wright, Chris Cowton, Kathy Walsh, Richard Walton, Feixue Xue, Mikko, Mäkinen, Olga, Neselevska, Gulnur Muradoglu and Minna Martikainen.

ACCEPTED MANUSCRIPT

Corporate Social Responsibility, Firm Value, and Influential Institutional Ownership**Abstract**

We examine how Corporate Social Responsibility (CSR), jointly with influential institutional ownership (IO), affects firm value around the 2008 global financial crisis. We find that the effect of CSR on firm value varies with the level of influential institutional ownership and depends upon economic conditions. Using difference-in-difference methods, we show that compared with non-CSR firms, CSR firms have higher firm values before the financial crisis but experience more loss in firm value during the crisis. Our findings suggest that the overall CSR effect depends on the relative dominance of two effects: conflict-resolution and overinvestment effect. In addition, we apply triple difference analysis and show that the relation between CSR and firm value depends upon the level of influential institutional ownership. Specifically, before the crisis, CSR positively affects the value of low institutional ownership firms and the effect is significantly weaker for firms with higher influential IO. During the crisis, the CSR-firm value relation is positive for high institutional ownership firms, suggesting that overinvestment concerns dominate when the crisis occurs. However, such a positive IO effect is not significant for CSR firms with high rollover risks. Our results are supported by a series of robustness tests.

1. Introduction

Is there a significant link between Corporate Social Responsibility (CSR) and financial performance or, ultimately, firm value? How does CSR, jointly with influential institutional ownership, affect firm value? In this paper, by applying difference-in-difference (DID) and triple difference (DDD) approaches, we document that institutional ownership (IO) can have non-trivial influences on the CSR-firm value relation.

Existing theoretical research remains inconclusive on the effect of CSR on firm value or financial performance.¹ The conflict resolution theory explains that high CSR activities can lead to high firm value by mitigating conflicts of interest between managers and non-investing stakeholders, improving firm reputation, and enhancing firm profitability.² However, the overinvestment theory suggests that such practices are costly, generating overinvestment concerns, especially during the 2008 financial crisis. In addition, the empirical literature finds both positive and negative effects of CSR on firm value.³ For example, Bird, Hall, Momente, and Reggiani (2007) and Harjoto and Jo (2015) suggest that different aspects of CSR activities, such as community versus product related CSR or legal versus normative CSR, have various implications to firm value.

Identifying the impact of CSR on firm value can be challenging. First, CSR can be endogenous to factors such as firm financial performance and liquidity, i.e., firms tend to do good when they do well. (Waddock and Graves (1997) and Hong, Kubik, and Scheinkman (2012)). This issue can lead to biased estimation on CSR-firm value relation. Second, the CSR-

¹ Excellent literature reviews may be found in Berman et al (1999), Margolis and Walsh (2003), Margolis et al. (2007), Renneboog et al (2008), Friede et al. (2015) and Servaes and Tamayo (2017).

² See, among others, Turban and Greening (1997), Jensen (2002), Scherer et al (2006), Cespa and Cestone (2007), Jo and Harjoto (2011), and Servaes and Tamayo (2013).

³ See, for example, Jo and Harjoto (2011, 2012), Nelling and Webb (2009), Crisóstomo, Freire, and Vasconcellos (2005), Brammer, Brooks, and Pavelin (2006), Hillman and Keim (2001), Bird, Hall, Momente, and Reggiani (2007), and Harjoto and Jo (2015).

firm relation depends on which CSR effect dominates: the conflict resolution or the overinvestment effect.

To overcome these challenges, we examine the CSR effect surrounding the 2008 financial crisis. Motivated by existing studies⁴, we treat the recent financial crisis as an exogenous shock to firms and use it to disentangle the recursive relation between CSR and firm value. Faced with limited financial resources over an uncertain duration, firms tend to significantly reduce investment (Almeida, Campello, Laranjeira, and Weisbenner, 2012) and are unlikely to relate their CSR engagement to prior firm performance. In addition, the financial crisis magnifies agency problems (Johnson, Boone, Breach, and Friedman, 2000; Bernanke, Gertler, and Gilchrist, 1999) and potentially amplifies the costs of CSR activities.

We apply difference-in-difference (DID) methodology using non-CSR firms as a control group to help “difference out” possible confounding factors and isolate the effect of CSR practices on firm value. We use a propensity score matching approach to construct a comparable control group.

We find that CSR firms have higher firm value than non-CSR firms before the financial crisis. However, when the crisis occurs, CSR firms experience more loss in firm value. Our evidence suggests that the importance of the CSR conflict-resolution effect and overinvestment effect varies with economic conditions: the relative importance of the overinvestment effect increases following the onset of the financial crisis.

We next explore how influential institutional ownership (IO) impacts the CSR effects. On the one hand, influential investors, such as blockholders and long-term dedicated institutions, help to mitigate CSR overinvestment through effective monitoring (Chen, Harford, and Li, 2007;

⁴ See, among others, Lemmon and Lins (2003), Duchin, Ozbas and Sensoy (2010), Bharath, Jayaraman, and Nagar (2013), and Lins, Volpin, and Wagner (2013).

Starks, 2009; Gillan, Hartzell, Starks, 2010). On the other hand, influential IO can exacerbate the conflict between shareholders and non-investing stakeholders (Lemmon and Lins, 2003; Guiso, Sapienza, and Zingales, 2014), which overshadows the CSR conflict-resolution effect.⁵

We apply triple difference analysis (DDD) to identify the effect of influential institutional ownership on the CSR-firm value relation. We find that before the crisis the relation between CSR and firm value is positive for low institutional ownership firms, which indicates that the CSR conflict-resolution effect dominates. However, the results show that this effect is significantly lower for firms with high influential IO than for firms with low IO. The evidence suggests that the benefits of implementing CSR are higher for firms with low monitoring IO than those for high-IO firms.

Moreover, the results show that during the crisis, high institutional holdings have a positive impact on the CSR value effect when the crisis occurs. We find that relative to their comparable non-CSR peers within the same IO group, the decrease in firm value of high-IO CSR firms is less substantial than that of low-IO CSR firms. Our results supports the view that institutional ownership can be an effective value-increasing mechanism, especially during an economic recession (see, for example, Mitton, 2002).

Interestingly, we find that the positive impact of influential IO on CSR-firm value relation disappears for a subsample of firms with debts maturing right at the beginning of the crisis. Prior studies suggest that rollover risks can lead to severe outcomes such as underinvestment and default (see, for example, He and Xiong, 2012; Almeida et al., 2012). In addition, debtholders such as banks can play an active monitoring role and help mitigate agency problem (e.g., James, 1987; Lummer and McConnell, 1989; Rauh and Sufi, 2010). Our results

⁵ Edmans (2014) provides a great review on blockers and corporate governance.

suggest that the monitoring effect of short-term debtholders eclipses the positive impact of high institutional ownership on CSR-firm value relation during the crisis.

Our results are robust to a variety of model specifications, various measures of influential institutional ownership, different propensity matching methods, and different industry definitions. In addition, our results remain qualitatively the same when applying a regression discontinuity design to a restricted sample firms ranked around Russell 1000/2000 cut-off.

Our study is related to several studies that examine the relation between CSR and firm value (Margolis and Walsh, 2003; Jo and Harjoto, 2011; Servaes and Tamayo, 2013; Flammer, 2015). Different from prior studies, we focus on the effect of CSR on firm value around the financial crisis for cleaner identification. Our test design not only allows us to study the effect of CSR on firm value at a particular point in time, but also helps us examine the evolution of such an effect over economic cycles. Contributing to the ongoing debate regarding the value implications of CSR, we find that CSR value effect varies with economic situations.

Related to Lins, Servaes, and Tamayo (2017), we examine the CSR effect around the financial crisis. However, our study is different from Lins, Servaes, and Tamayo (2017) in the following aspects. First, Lins, Servaes, and Tamayo (2017) examine how CSR intensity affects stock returns. We ask a different research question: how CSR affects firm value, proxied by Tobin's Q. Different from stock returns, Tobin's Q not only incorporates forward-looking market valuation, but also reflects management performance because a high Tobin's Q suggests that managers can generate large market value from per unit of underlying assets. Second, different from Lins et al. (2017), we identify the interaction between CSR and influential institutional ownership on firm value. Our evidence highlights the importance of influential institutional ownership on the CSR effects. Third, Lins et al. (2017) find that firms with higher CSR

engagement exhibit a larger *change* in stock return when the crisis occurs. In contrast, we show that the *change* in CSR firms' value, net of the *change* in non-CSR firms' value, is significantly negative following the onset of the crisis.

Our paper also adds new evidence to the literature by showing that the CSR value effect varies with influential institutional ownership level. Our paper is different from Jo and Harjoto (2011) in the following ways. First, different from Jo and Harjoto (2011), we use ESG score as a proxy for a firm's CSR intensity. Our measure not only reflects environmental and social categories but also incorporates the internal governance issues. Secondly, instead of focusing on a cross-sectional CSR effect on the *level* of firm value, we investigate the CSR effect on the *change* in firm value surrounding the financial crisis. Different from Jo and Harjoto (2011), we show that CSR engagement can have a negative impact on the *change* in firm value. Lastly, Jo and Harjoto (2011) examine the sole effect of institutional ownership. In contrast, we focus on the joint effect between influential institutional ownership and CSR on firm value. We show that the strength of influential institutional ownership affects the association between CSR and firm value.

Finally, our study provides implications to socially responsible investments (SRI). Our results suggest two important factors that SRI investors should consider: influential institutional ownership and market conditions.

The rest of the paper is organized as follows. Section 2 provides the literature review and motivation for the study. Section 3 discusses data sources and sample characteristics. Section 4 reports the empirical results and robustness tests. Section 5 concludes. The appendix provides definitions for the variables used in our tests.

2. Literature Review and Empirical Methodology

2.1 CSR and Firm Value

CSR is defined as “*actions that appear to further some social good, beyond the interests of the firm and that which is required by law*” (McWilliams and Siegel, 2001). According to this definition, CSR activities not only affect investing stakeholders such as stockholders and debtholders, but also non-investing stakeholders such as customers, community, social organizations, and others. Given the broad scope of stakeholders involved, is a firm’s socially responsible behavior consistent with value-maximizing interests of investors? Put another way, does CSR help to enhance firm value?

The “overinvestment hypothesis” suggests a negative relation between CSR and firm value (Cespa and Cestone, 2007; Barnea and Rubin, 2010). Agency problems arise from the separation of ownership and control when firm managers have insufficient residual claims on a firm. Based on the agency theory, insiders tend to overinvest in CSR to increase their reputation and to be entrenched as socially responsible managers at the expense of shareholders. In other words, CSR investments represent costly diversions of a firm’s valuable resources due to the agency conflicts between managers and shareholders. Barnea and Rubin (2010) argue that managers have an incentive to increase firms’ CSR expenditure beyond an optimal level. As such, overly invested CSR practices can destroy firm value. They also show empirically that higher insider holdings are associated with lower CSR practices. Additionally, Krüger (2015) finds that there are substantial costs associated with social irresponsibility.

In contrast, according to the “conflict resolution hypothesis” or “reputation-building hypothesis” (Freeman, 1984; Makni et al., 2009; Jo and Harjoto, 2011, 2012), one would expect a positive CSR effect on firm value. According to Freeman’s (1984) stakeholder theory, firms

can use CSR to mitigate conflicts between managers and non-investing stakeholders. In addition, Jo and Harjoto (2011, 2012) suggest that CSR engagement can be used as a mechanism to achieve better communication between insiders and outsiders and thus reduce conflict of interest between managers and various non-investing stakeholders. They find that CSR is related to higher firm value. Guenster et al. (2010) and Jiao (2010) show that corporate social performance is associated with a positive valuation effect. Cui, Jo, and Na (2016) present empirical evidence that CSR activities help to reduce firms' information asymmetry. Thus, the CSR activities can enhance firm value through reduced conflict of interest between managers and non-investing stakeholders.

As discussed above, CSR affects firm value through different channels with contrasting results and implications. Although the majority of existing empirical findings suggest a positive effect of CSR on both firm value and financial performance⁶, a growing number of studies document otherwise. For example, Brammer et al. (2006) find that firms with higher social performance scores realize lower shareholder value. Nelling and Webb (2009) find no evidence that CSR activities affect financial performance. Focusing on non-financial Brazilian firms, Crisóstomo, Freire, and Vasconcellos (2005) document a strong negative relation between CSR and firm value, or Tobin's Q.

Moreover, several studies suggest that the components of CSR activities matter in different ways. For example, Bird, Hall, Momente, and Reggiani (2007) find that community- and environment-related CSR practices, viewed mainly as philanthropic activities, are associated with a lower book-to-market ratio and price-to-earnings ratio. Hillman and Keim (2001) study S&P 500 firms and find that stakeholder management leads to improved firm value measured by Tobin's Q, while social issue participation is negatively associated with firm value. Moreover,

⁶ See, among others, Guenster et al. (2010), Jiao (2010), and Jo and Harjoto (2011, 2012).

Harjoto and Jo (2015) examine the differential impact of the overall, legal, and normative CSR on firm value. They find that although the high overall CSR score increases firm value, high normative CSR (not related to law) reduces firm value.

2.2 Influential Institutional Holdings, CSR, and Firm Value

Influential institutional ownership (IO) can affect the relation between CSR and firm value in two contrasting ways. Ex ante, there are inconclusive predictions as to the overall impact of influential IO on the CSR-firm value relation. On the one hand, influential IO can have a positive impact on the CSR-firm value relation by mitigating concerns about overinvestment and agency problems through promoting the optimal allocation of firm resources and monitoring managerial actions. By holding sizable and stable stakes in a firm, large shareholders, such as blockholders and long-term dedicated institutions, specialize in monitoring activities and play a crucial role in corporate governance (Gillan and Starks, 2003; Chen, Harford, and Li, 2007; Starks, 2009; Gillan et al., 2010). Therefore, monitoring by influential institutions can shield shareholders against value-destroying activities related to CSR engagement.

On the other hand, influential institutions can subdue the value-enhancement of CSR by stimulating the conflict between shareholders and non-investing stakeholders. In addition, these institutions can disturb firm information disclosure, thereby increasing information asymmetry between firms and their non-investing stakeholders. Prior studies show that excess governance controls can have a negative impact on firm value (See, among others, Claessens et al., 2002; La Porta et al., 2002; and Lemmon and Lins, 2003). In addition, high institutional investor intervention decreases management incentives and integrity (Burkart, Gromb, and Panunzi, 1997; Guiso, Sapienza, and Zingales, 2014). Low level of perceived management integrity is positively correlated with bad outcomes in terms of lower productivity and lower firm value

(Tobin's Q). Moreover, influential institutional investors can reduce firm value if they extract their own private benefits, but the benefits are not shared with minority investors and other CSR-related stakeholders (see the discussion in Edmans et al., 2014).

2.3 Empirical Methodology

In this study, we evaluate the impact of influential institutional holdings on the CSR-firm value relation. There are two major empirical challenges in the existing literature. First, several studies identify the endogenous nature of firm performance and CSR activities. For example, Waddock and Graves (1997) document a recursive relation between corporate social actions and firm financial performance. They provide empirical support for both the view that socially responsible behavior leads to improved financial performance and the view that better prior financial performance results in higher future CSR engagement. Hong, Kubik, and Scheinkman (2012) also find that corporate goodness for financially-constrained firms is more sensitive to their share valuation. They suggest that *“a clear identification strategy is crucial to understanding other fundamental questions on the nexus of corporate social responsibility and firm performance.”*

Second, CSR affects firm value through two mechanisms with opposite effects. CSR benefits firm value by resolving the conflict between managers and stakeholders while it can destroy firm value because of overinvestment. The overall impact of CSR on firm value depends on which one is dominant.

To address the empirical challenges, we apply difference-in-difference (DID) methodology to examine the variation in firm value across firms with different CSR practices around the financial crisis. Motivated by prior literature⁷, we use the 2008 financial crisis to

⁷ See, among others, Lemmon and Lins (2003), Duchin, Ozbas, Sensoy (2010), Bharath, Jayaraman, and Nagar(2013), and Lins, Volpin, and Wagner (2013).

mitigate concerns about the potential endogeneity between CSR activities and firm performance. Specifically, we use the 2008 financial crisis as a source of an unexpected exogenous event (from an individual firm's perspective) to help circumvent the endogeneity problem related to the recursive relation between CSR and firm value (Meyer (1995) and Roberts and Whited (2012)).

In addition, our empirical design helps us to identify the time-varying CSR-firm value effect. The nature of the financial crisis can magnify the costs of implementing CSR practices. CSR-related agency problems tend to be amplified during periods of financial distress rather than during a business boom (Rajan and Zingales, 1998; Johnson, Boone, Breach, and Friedman, 2000; Bernanke, Gertler, and Gilchrist, 1999). In addition, Johnson, Boone, Breach, Friedman (2000) study the effect of the Asian financial crisis and show that weak corporate governance and gloomy economic prospects result in more expropriation by managers and thus a larger fall in asset prices. Therefore, during the crisis, CSR's over-investment costs can potentially outweigh its conflict-resolution benefits without sufficient monitoring provided by external corporate governance.

Finally, the financial crisis provides an interesting opportunity to focus on the monitoring effect of influential IO. Research shows that institutional investors affect firm management and firm values via two complementary channels: 1) to engage with management actively, known as "voice" (Aghion, Bolton, and Tirole, 2004; Back, Li, and Ljungqvist, 2014); and 2) to influence manager decisions through an "exit threat" by selling their shares if managers underperform (Admati and Pfleiderer, 2009; Edmans, 2009; Edmans and Manso, 2011). During a financial crisis when stock liquidity becomes low, blockholders' exit threat becomes weaker and institutional engagement intensity increases (Edmans, Fang, and Zur, 2013, and McCahery,

Sautner, and Starks, 2016). In other words, around a financial crisis, institutional investors monitor firms mainly through their involvement in corporate governance.

We investigate changes in firm value, measured by Tobin's Q, for CSR firms surrounding the financial crisis, controlling for changes in firm value of matched non-CSR firms over the same period. We use comparable firms without CSR practices as a control group to help "difference out" possible confounding factors and isolate the effect of CSR practice on firm value. We estimate the following DID regression models:

$$\text{Tobin's } Q_{i,t} = a_0 + a_1 \text{CSR}_{i,2006} + a_2 \text{Crisis}_t + a_3 \text{CSR}_{i,2006} * \text{Crisis}_t + A'X_{i,t-1} + \eta_{i,t} \quad (1)$$

$$\text{Tobin's } Q_{i,t} = b_0 + b_1 \text{CSR}_{i,2006} + b_2 \text{Post-crisis}_t + b_3 \text{CSR}_{i,2006} * \text{Post-crisis}_t + B'X_{i,t-1} + e_{i,t}, \quad (2)$$

where the dependent variable is *Tobin's Q* at the end of quarter q , *Crisis* indicates the time period is between 2008Q3 and 2009Q1, and *Post-crisis* is equal to one if the time period is between 2010Q1 and 2010Q4 and zero otherwise. Following Lins, Servaes, and Tamayo (2017), we measure firm's CSR activities in year 2006 to mitigate concern that firms change their CSR policies in anticipation of, or in response to, the impact from 2008 financial crisis.

In the regression models, the first difference reflects the change in firm value between before-crisis period and the crisis-period (in Equation 1) and between the crisis period and the post-crisis period (in Equation 2). The variables reflecting the difference are dummy variable *Crisis* in Equation 1 and *Post-crisis* in Equation 2. The second difference is the difference in the change in firm value between the CSR firms and non-CSR firms, reflected in the coefficient estimates of the dummy variable *CSR*.

To capture the difference-in-difference of the CSR firm value, the key variables of interest are the interaction terms, *CSR * Crisis* (in Equation 1) and *CSR * Post-crisis* (in Equation 2). The purpose is to examine how CSR activities affect the change in firm value

surrounding the financial crisis by controlling for other possible factors that can affect the changes in firm value over time.

We then apply triple difference regression models to examine the joint effect of corporate social responsibility (CSR) and influential institutional ownership on firm value around the financial crisis. To do so, we use an indicator *High IO* to divide our sample into high and low influential IO groups at the beginning of 2006. Note that our *High IO* measure will not vary with firm fundamentals over the sample period. We allow the slope coefficients for *CSR*, *Crisis* (or *Pre-crisis*), and the interaction between *CSR* and *Crisis* (or *Post-Crisis*) to vary by influential IO groups. The regression models are as follows:

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & a_0 + a_1 CSR_{i,2006} + a_2 Crisis_t + a_3 CSR_{i,2006} * Crisis_t + a_4 High-IO_t + a_5 CSR_{i,2006} * High-IO_t \\ & + a_6 Crisis_t * High-IO_t + a_7 CSR_{i,2006} * Crisis_t * High-IO_t + A'X_{i,t-1} + \eta_{i,t}, \end{aligned} \quad (3)$$

and

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & b_0 + b_1 CSR_{i,2006} + b_2 Post-crisis_t + b_3 CSR_{i,2006} * Post-crisis_t + b_4 High-IO_t \\ & + b_5 CSR_{i,2006} * High-IO_t + b_6 Post-crisis_t * High-IO_t + b_7 CSR_{i,2006} * Post-crisis_t * High-IO_t + B'X_{i,t-1} + e_{i,t} \end{aligned} \quad (4)$$

The key variables of interest are the triple-difference interaction term: *CSR * Crisis * High-IO* (in Equation 3) and *CSR * Post-crisis * High-IO* (in Equation 4). The interaction terms capture the change in Tobin's Q of CSR firms, net of change in Tobin's Q of non-CSR firms, from before to after the financial crisis period in high influential IO group. We report our estimation results in Section 4.

3. Data and Variables Definition

3.1. CSR Data

Our study focuses on the relation between CSR and firm value surrounding the 2008 financial crisis. Using Bloomberg we collect information on CSR activities for Russell 3000 firms in the year 2007. Bloomberg's ESG scores are gathered from public sources such as

company annual filings and CSR reports, corporate websites, questionnaires, media coverage, and public disclosure data such as the carbon disclosure project (CDP) (Bloomberg, 2012). Bloomberg assigns a score in each area and then constructs an aggregated ESG score for the company, which is then adapted to the geographical and industry sector⁸. The resulting score ranges from 0 for firms that do not disclose ESG information to 100 for firms that disclose all ESG information recognized by Bloomberg. Therefore, the Bloomberg ESG scores reflect all publicly available information on firm CSR practices.

The ESG scores cover the areas of environment, social, and governance. The “Environmental” score is measured along dimensions including (but not limited to): energy consumption, water use, methane emissions, and environmental fines. The “Social” score is measured along the following dimensions: number of employees; percent of employees unionized; training policy; human rights policy; anti-bribery ethics policy; UN Global Compact Signatory etc. “Governance” is measured along dimensions including: size of the board; percent of independent directors; number of board meetings; board meeting attendance; board meeting attendance etc.

Besides the Bloomberg ESG database, there are several other sources that measure CSR activities. However, existing studies point out the inconsistencies and biases in CSR data from sources such as KLD, Fortune reputation survey, Toxic Release Inventory (TRI), corporate philanthropy, FTSE4Good, and DJSI (see, among others, Griffin and Mahon, 1997; Chatterji, Levine, and Toffel, 2009; Chatterji, Durand, and Levine, 2015). For example, Griffin and Mahon (1997) show that KLD is inconsistent and biased since the information is based on impressions

⁸ According to the Bloomberg online ESG manual, “Each data point is weighted in terms of importance, with data such as Greenhouse Gas Emissions carrying greater weight than other disclosures. The score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector.” Although the scoring is based on the Global Responsive Initiative (GRI), Bloomberg’s exact weighting methodology is proprietary.

of what the firm has done, rather than what the firm has actually done. Chatterji, Levine, and Toffel (2009) suggest that the KLD database has low validity due to lack of transparency about firms' environmental performance.

However, ESG data has its own limitations. ESG data quality is often perceived as “soft” rather than hard or concise (Park and Ravenel, 2013). In addition, the difference in the magnitude of ESG scores does not have rich quantitative implications given the existence of data inconsistencies across industries and years. To deal with the limitations of the ESG data, we classify firms into two categories based on firm ESG disclosure score. We define “*CSR Firm*” as one if a firm has an ESG disclosure score and zero if a firm has no ESG disclosure score. Such treatment mitigates the concern of measurement error in the raw ESG scores.

We collect firm accounting information from Compustat Annual and Quarterly Industrial file (COMPUSTAT) and stock trading data from the Center for Research in Security Prices (CSRP) monthly and daily files. We exclude financial firms from our sample since these firms received substantial government assistance during the financial crisis. To reduce the influence of outliers, we winsorize each continuous variable at the 1st and 95th percentile.

We apply a propensity matching approach to find a comparable non-CSR firm for each CSR firm at the beginning of 2006. We select the closest match with replacement (Roberts and Whited, 2012) to each CSR firm along two different dimensions: firm size and industry. We also impose a common support by dropping treatment observations whose scores are outside the range of the controls' scores.⁹ Following Nelson, Moffitt, and Affleck-Graves (2005) and Chhaochharia and Grinstein (2007), we define industry according to the Fama-French 17

⁹ Our results remain robust when using caliper matching with a caliper of 0.01.

industry classifications^{10, 11} We require matching firms not to have ESG disclosure scores during our sample period (from 2006 January to 2010 December).

3.2. Key variables definition

We use Tobin's Q, the ratio of market value of assets to book value of assets, to proxy for firm value. Different from accounting-based returns, Tobin's Q incorporates market opinion about the firm's future cash flow and risk, i.e., forward-looking market valuation. Different from stock returns, high Tobin's Q reflects good management because it implies that a firm's managers can create greater market value from the same underlying assets. We calculate Tobin's Q as market value of equity plus liquidating value of preferred stock plus book value of debt minus balance sheet deferred taxes and investment tax credit divided by total assets at the end of the previous period. Since it is the dependent variable, according to econometric theory, our tests do not suffer any estimation bias from estimation errors in Tobin's Q.

Motivated by existing studies on the determinants of Tobin's Q (see, for example, Laeven and Levine, 2008; Kalcheva and Lins, 2007; Servaes and Tamayo, 2013), we control for factors that affect firm value, such as firm size, sales growth, capital expenditures, fixed asset to book asset, cash holdings, leverage, R&D intensity, profitability, and advertising intensity. We follow Edmans, Fang, and Lewellen (2017) and construct quarterly accounting measures. Specifically, we define sales growth rate as current quarterly sales divided by sales of the same quarter in the previous year minus one. Capital expenditures to book asset ratio is the ratio of current quarter capital expenditures scaled by total assets at the end of the previous quarter. We measure fixed asset to book asset as the ratio of book value of property, plant, and equipment to book value of total assets. Book leverage is calculated as the ratio of total debt to total assets. We measure cash

¹⁰ The detailed definition is available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

¹¹ We document qualitatively the same findings when applying Fama-French 48 industry classification.

holdings as cash and short-term investments divided by total assets, both measured at the end of a quarter. We define R&D intensity as R&D to book asset ratio, which equals current quarter research and development expense divided by total book asset at the end of the last quarter. We set R&D expense to zero when research and development expense is missing. We measure profitability as the ratio of net income to book value of total assets. Finally, we follow Servaes and Tamayo (2013) to construct a measure of consumer awareness, proxied by advertising intensity, or a ratio of annual advertising expenses to annual sales measured at the end of a fiscal year.

We further examine the differential effects of influential institutional ownership on the relation between CSR and firm value. In our main tests, we use three measures to proxy for influential institutional ownership: Block holder Ownership, Top 5 Institutional Ownership, and Long-term Institutional Ownership. *Block Institutional Ownership* refers to the percentage of a firm's shares held by investors whose ownership is at least 5% of the firm's shares. *Top Five Institutional Ownership* refers to the aggregate percentage of a firm's shares held by the 5 largest institutional investors. Long-term Institutional Ownership refers to the percentage of shares in a firm held by its long-term institutional investors. Following Yan and Zhang (2009), we first classify institutional investors into short- and long-term investors according to portfolio turnover rates (or churn rates) during the past four quarters. The investors with a churn rate ranked in the top (bottom) tercile are defined as short-term (long-term) investors.

For robustness checks, we use Dedicated and Quasi-indexer Ownership as measures of influential institutional ownership. We apply the method in Bushee (1998, 2001) to classify institutions into dedicated and quasi-indexer groups, based on their investment patterns.¹² The

¹² We thank Brian J. Bushee for providing the institutional investor classification data.

data on institutional ownership is from Thomson Financial CDA/Spectrum 13f Institutional Holdings data. A full description of the variables is presented in the Appendix.

Table 1 provides descriptive statistics for CSR firms and their corresponding matched firms at the beginning of 2006 (before the financial crisis). The results indicate that CSR firms tend to have significantly higher Tobin's Q than non-CSR firms. In our regression tests, we examine how CSR activities and institutional ownership affect the level as well as the change of Tobin's Q.

At a minimum, firm fundamental characteristics between CSR firms and the matched firms should not be statistically different, so as not to undermine the effectiveness of the matching process. Table 1 shows that the CSR firms exhibit similar characteristics from those of their matched firms, with the exception of book leverage, and profitability. For example, the differences are not significant between CSR firms and matched non-CSR firms in terms of book asset, sales growth rate, capital expenditure, fixed assets, cash holdings, R&D expense, and advertising intensity. The results indicate that the matching process is quite efficient.

Although the matched sample firms have statistically similar long-term, dedicated, and quasi-indexer institutional ownership, the results show that CSR firms, on average, have lower block and top-five institutional ownership than non-CSR firms. In our later tests, we still control for the heterogeneity in firm fundamentals.

[INSERT TABLE 1 ABOUT HERE]

4. Empirical Analysis

4.1. Change in Firm Value Following the Onset of the Financial Crisis

We first test whether CSR practices play a role in the change of firm value at the onset of the financial crisis. Using equation 1, we estimate a difference-in-difference (DID) regression of

Tobin's Q on the dummy of CSR, time dummy of the crisis period (*Crisis*), the interaction of the two, and control variables.

The coefficient of interest is the *CSR*Crisis* interaction term, which measures the different response of firm value to an unexpected financial crisis between CSR firms and non-CSR firms. If the benefits of implementing CSR outweigh the costs of doing so, one should observe a positive and significant coefficient for this interaction term. In contrast, if it is too costly to invest in CSR activities, the coefficient for this interaction term should be negative and significant.

Table 2 displays the estimates of the DID regressions by comparing the pre-crisis (2006Q1—2007Q2) and crisis period (2008Q3—2009Q1). First, we document a positive and significant relation between CSR and firm value before the crisis. The coefficient estimates on the indicator of *CSR* is positive and statistically significant for both model specifications. For example, in Model 2, the coefficient of *CSR* is 0.252 with t value of 4.75. Consistent with existing studies (Waddock and Graves, 1997; Blazovich and Smith, 2011; Jo and Harjoto 2011, 2012, 2015), the results suggest that on average, CSR firms exhibit higher firm value than non-CSR firms before the financial crisis. The evidence suggests that before the crisis, the conflict-resolution benefits of CSR dominate its overinvestment costs, resulting in a positive effect of CSR activities on firm value.

As expected, the coefficients on the dummy variable *Crisis* are negative and significant for both models. The evidence suggests that firms, on average, experience a loss in firm value when the financial crisis occurs.

[INSERT TABLE 2 ABOUT HERE]

Notably, Table 2 results show that the coefficient estimate on the interaction term *CSR * Crisis* is negative and significant. The estimated coefficients are -0.150 and -0.137, with t-statistics of -3.00 and -2.70 for Model 1 and 2, respectively. The results show that the change in Tobin's Q of CSR firms, net of the change in Tobin's Q of non-CSR firms, is significantly negative from the pre-crisis to the crisis period. We interpret this result as follows. During the financial crisis when firm financial resources become more valuable and the expected return on investment falls, agency conflicts, especially overinvestment concerns, could become more severe (Johnson, Boone, Breach, and Friedman, 2000; Bernanke, Gertler, and Gilchrist, 1999). Under such conditions, CSR over-investment costs can outweigh conflict-resolution benefits. Therefore, CSR firms experience more of a decrease in firm value than non-CSR firms during the crisis.

The coefficient signs for the control variables are consistent with existing empirical evidence on Tobin's Q. In particular, note that firm Tobin's Q is negatively related to book asset value and asset tangibility while it is positively related to sales growth rate, capital expenditure, R&D intensity, cash holdings, firm profitability, and consumer awareness (i.e., advertising intensity).

In sum, the evidence in Table 2 suggests that CSR firms have higher firm values than non-CSR firms before the financial crisis, exhibiting the CSR conflict-resolution effect. However, CSR firms are hit harder than non-CSR firms in terms of firm value during the crisis. The evidence suggests that the costs of employing CSR programs can outweigh the benefits when an unexpected crisis emerges, consistent with the overinvestment hypothesis.

We note that this result is not driven by unobserved industry-level factors, e.g., a (un)favorable industry product market condition around the crisis. The estimation results remain

robust with or without controlling for industry-fixed effects. We then examine whether influential institutional ownership can potentially affect the relation between CSR and firm value.

4.2. Interactions among Firm Value, CSR, Influential Institution Ownership Following the Onset of the Financial Crisis

In this section, we examine the differential impact of CSR practices on firm value across firms with different levels of institutional ownership when an unexpected financial crisis occurs. Following Chen, Harford, and Li (2007), we use block ownership, the aggregate ownership of the top five institutional investors to measure the ownership of influential institutional investors. In addition, motivated by Elyasiani and Jia (2008) and Elyasiani et al. (2010), we treat long-term institutions as monitoring investors. Both papers argue that stable institutional investors are better motivated and possess better resources to monitor effectively; thus these long-term investors play an important role in mitigating agency conflicts.

We sort our sample into two groups according to the ownership level of influential institutional investors in the beginning of year 2006: High- (above median) and Low- (below median) influential ownership. We keep the composition of groups unchanged throughout our whole sample period 2006-2010.

To test formally whether influential institutional holdings affect the CSR-firm value relation, we estimate Equation 3. Our interest is in whether the slope coefficient on $CSR * Crisis$ is significantly different between high-IO and low-IO groups. We test this by examining whether the triple interaction term $CSR * Crisis * High IO$ is significantly different from zero.

[INSERT TABLE 3 ABOUT HERE]

Table 3 provides triple difference estimation results, controlling for industry-fixed effects. We draw several conclusions from the results. First, we find a positive and significant relation between CSR and firm value before the crisis among firms with low-influential IO, consistent with the results in Table 2. However, with the DDD method, we document a differential impact of influential holdings on CSR-firm value relation before the crisis. The coefficient on the interaction between *CSR* and *High IO* is -0.205 with t-value of -1.77 for Model 1 using the block IO measure; -0.362 with t-value of -3.24 for Model 2 using the top five IO; and -0.230 with t-value of -1.81 for Model 3 using the long-term IO measure. The results suggest that prior to the financial crisis, the difference in Tobin's Q between CSR firms and non-CSR firms is significantly lower in the higher influential IO group rather than in the lower influential IO group. We provide the following interpretation. Prior to the financial crisis, the overriding concern between managers and non-investing stakeholders is overinvestment. Such conflict is more severe among firms with low monitoring IO. Consistent with the conflict resolution hypothesis, CSR can be a complement to corporate governance and used as an effective mechanism to resolve such conflict. Therefore, prior to the crisis, the benefits of incorporating CSR are higher for firms with low monitoring IO rather than for high-IO firms.

Second, as expected, the evidence of negative and significant coefficients on *Crisis* show that the financial crisis weakens all low-influential IO firms, including the CSR firms. In addition, the coefficients for the interaction term *CSR * Crisis* are significantly negative. For example, in Model 1, the coefficient on the interaction between CSR and Crisis is -0.206 with t-value of -2.94. The results suggest that if institutional investors' monitoring activities are low, CSR firms decrease their firm value more than non-CSR firms when the crisis happens. Our interpretation of this finding follows. During the crisis, a large decrease in asset value intensifies

the agency problems, resulting in widespread credit rationing and huge cutbacks of all types of investment (Bernanke, Gertler, and Gilchrist, 1999). Almeida et al. (2012) and Duchin, Ozbas, and Sensoy (2010) find empirical evidence on the significant decrease in corporate investment following the onset of the 2008 crisis. Therefore, during the financial crisis when financial resources become more valuable, without proper monitoring, the CSR overinvestment costs can outweigh its conflict-resolution benefits. In other words, without sufficient monitoring and external corporate governance, the implementation of CSR programs is a waste of valuable firm resources and results in a decrease in firm value during the crisis.

Third, we find a positive impact of institutional holdings on the CSR-firm value relation. The regressions reveal a positive and significant relation between Tobin's Q and the triple interaction term $CSR * Crisis * High IO$. Consider the regression in Model 3, the coefficient on the triple interaction term is 0.266 with a t-value of 2.62, which means that the change in Tobin's Q of CSR firms, net of change in Tobin's Q of non-CSR firms, from prior to during the crisis is significantly positive in the group with high influential IO. The results suggest that high influential IO has a positive impact on the CSR-firm value relation following the onset of the crisis.

Combined with the results on the $CSR * Crisis$ interaction term, the evidence suggests that relative to their comparable non-CSR peers within the same IO group, the decrease in firm value of high-IO CSR firms is less dramatic than that of low-IO CSR firms. The results are consistent with the notion that institutional ownership can be viewed as a value-increasing mechanism since it helps to prevent potential managerial expropriation by exerting influence on firm management.

Finally, our results detailing *High IO* and the interaction term *Crisis * High IO* interaction term are consistent with Bharath, Jayaraman, and Nagar (2013), supporting the view that institutional investors with large holdings can govern firms through exit threats.

4.3. Recovery of Firm Value after the Financial Crisis

In this section, we study the recovery of firm value after the financial crisis. We evaluate the statistical significance of the impact of CSR on firm value using our propensity score matched sample and a difference-in-difference framework in equation 2.

[INSERT TABLE 4 ABOUT HERE]

Table 4 presents the estimation results. We document a positive relation between CSR practices and firm value during the financial crisis. For example, in Model 2, the coefficient of the dummy CSR Firm is 0.151 with a t value of 3.05. The results suggest that during the financial crisis, the value of CSR firms increases more than that of non-CSR firms.

In addition, as expected, the statistically positive coefficient on the post-crisis dummy shows that on average firm value increases after the financial crisis. As shown in Table 4 Model 2, the coefficient of Post-crisis is 0.139 with a t value of 4.03.

Interestingly, the coefficient on the variable of interest *CSR * Post-crisis* is insignificant. The results suggest that the change in firm value of CSR firms is not significantly different from that of non-CSR firms after the 2008 financial crisis. We provide the following interpretation. After a financial crisis, it often takes a long time for the economy and individual firms to recover. For example, to stimulate the economy following the last financial crisis, the US Federal Reserve used several rounds of Quantitative Easing (QE) since late 2008. During the post-crisis period defined in this study, the Fed ran an extended QE1 program in early 2010 and then initiated QE2 program in November 2010. It was not until October 2014 that it concluded its

QE3 program. As described in Hall (2010), US production output and employment collapsed after the 2008 crisis and remained low for many years. In an environment of economic policy uncertainty and prolonged financial frictions, the benefits of investing in CSR activities may not necessarily outweigh the costs of doing so. As a result, there is no difference in the recovery of firm value between CSR and non-CSR firms.

4.4. Interactions among Firm Value, CSR, Influential Institution Ownership after the Financial Crisis

We measure the effects of CSR on individual firm value using a triple difference analysis in which different CSR level (first difference) affects firm value following the financial crisis (second difference), and influential institutional ownership affects the relation between CSR and firm value over different time periods (third difference). As in Table 3, we use three variables to measure the ownership of influential institutional investors: block ownership, the aggregate ownership of top five institutional investors, and long-term investors. We present the results in Table 5.

Consistent with the results in Table 4, we show that CSR activities do not have any effects on firm value recovery. The coefficients on the interaction term $CSR*Post-crisis$ are not statistically significant across all three models. In addition, institutional ownership does not influence firm value recovery after the crisis. The coefficients of the interaction term $Post-crisis*High IO$ are not significant across all three models. Moreover, CSR firms with high institutional ownership do not outperform otherwise comparable firms in the post crisis period. The coefficients on the triple interaction term $CSR * Post-crisis * High IO$ are not significant. The results suggest that neither the CSR nor institutional ownership has influence on firm value in the post crisis period.

[INSERT TABLE 5 ABOUT HERE]

Our results suggest that after the crisis CSR firms do not recover firm value quickly relative to other firms. In addition, high institutional ownership does not always have a positive impact on the relation between CSR activities and firm value. During the post financial crisis period, overinvestment is less of a concern, and therefore the value effect of institutional ownership is less evident.

4.5 Firm Value and Stock Returns Surrounding the 2008 Crisis

In this section, we apply the model specification in Lins, Servaes, and Tamayo (2017) to our matched sample firms to investigate how CSR affects the performance of firm value and stock returns surrounding the financial crisis (from January 2006 to December 2010). In this model, firm-fixed and industry-fixed effects help to control for invariant and omitted firm- and industry-related factors. Firm-fixed effects also absorb the effects of the firm CSR measure. The time fixed effect variable helps to remove time-series patterns in the data. The variables of interest are interaction terms $CSR * Shock$, $CSR * Crisis$, and $CSR * Post-crisis$. The coefficient of these interaction terms reflects the differential impact of CSR on firm value, Tobin's Q, during the shock-to credit period, crisis period, and after-crisis period.

[INSERT TABLE 6 ABOUT HERE]

Table 6 Model 1 presents the regression estimates using the Tobin's Q model. The coefficient on the interaction term $CSR * Crisis$ is negative and statistically significant, with a t value of -3.17. Consistent with our previous results, the result suggests that CSR firms experience a larger decrease in firm value following the financial crisis than their comparable non-CSR firms. Please note that since the CSR impact on firm value before the financial crisis is

absorbed by the firm fixed effects, it is impossible for us to conclude whether CSR firms exhibit overall lower *level* of firm value than their non-CSR peers during the crisis.

However, Model 1 reveals that there is an insignificant difference in the change of firm value between CSR firms and non-CSR firms either during the shock-to-credit period or post-crisis period. The results in Table 6 are consistent with our main findings in both Tables 2 and 4. These results suggest that the impact of CSR on firm value is dynamic and depends on economic conditions: CSR exerts an additional negative impact on firm value only during the crisis period. The evidence supports the overinvestment hypothesis and suggests that, when compared with non-CSR firms, CSR firms suffer more when an unexpected crisis strikes and do not exhibit a quicker recovery after the crisis.

In addition to the Tobin's Q model, we also investigate stock performance around the financial crisis. Model 2 provides the regression estimates of the stock return model. Consistent with Lins, Servaes, and Tamayo (2017), the coefficient on the interaction term $CSR * Crisis$ is positive and statistically significant, with a t value of 3.04. The evidence indicates that CSR firms exhibit a larger *change* in stock returns than non-CSR firms do when the financial crisis occurs. As discussed above, the effect of CSR over the period January 2006 - June 2007 is captured by firm effects. Therefore based on this regression estimation alone, we cannot judge whether CSR firms exhibit a higher level of stock returns than non-CSR firms during the financial crisis.

Similar to Lins, Servaes, and Tamayo (2017), our results reported in Model 2 indicate that during the post-crisis period, there is an insignificant difference in the change of stock returns between CSR and non-CSR firms.

Finally, the evidence shows that the interaction term $CSR*Shock$ is statistically significant and positive with a t value of 2.87, suggesting that in contrast to Lins, Servaes, and Tamayo (2017), CSR firms have significantly higher change in stock returns during the supply-of-credit shock.¹³ However, from these regression estimates alone, it is not possible to compare stock returns *levels* between CSR and non-CSR firms during the shock or post-crisis period.

4.6 Firm Value, CSR, Dedicated and Quasi-indexer Ownership

Our main results so far suggest that CSR has an impact on firm value around the crisis and influential institutional ownership affects such time-varying impact. To check the robustness of our findings, we use two alternative measures of influential institutional ownership: dedicated and quasi-indexer institutional ownership to further explore whether the variation in monitoring explains the relation between CSR and firm value.

To separate long term investors from short term ones, Bushee (1998, 2001) categorizes institutional investors into dedicated, quasi-indexer, and transient institutions based on their past trading behaviors in areas such as portfolio turnover, diversification, and momentum trading. Following Bushee (1998, 2001), we construct dedicated and quasi-indexer institutional ownership variables using the classification obtained from Brian Bushee's website.¹⁴

A growing number of studies suggest that dedicated and quasi-indexer institutions are long-term investors and that these investors play an important monitoring role (among others, see Chen, Harford, and Li, 2007; Demiralp, D'Mello, Schlingemann, and Ubramaniam, 2011). Dedicated investors hold large and stable holdings in a small number of firms and have low

¹³ Please note that we use our matched sample and we estimate the regression model starting from January of 2006 instead of 2007. We are able to replicate the main findings in Lins, Servaes, and Tamayo (2017) using raw (or unmatched) sample over the period between January 2007 and December 2013. Results available upon request.

¹⁴ <http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html>.

portfolio turnover. Therefore, dedicated investors tend to perform a monitoring role by investing in information collection and by exerting influence on managers (Chen, Harford, and Li, 2007).

Quasi-indexers generally follow passive buy-and-hold strategies, characterized by holding large, well-diversified portfolios and trading very infrequently. Several studies show that quasi-indexers have causal impacts on corporate governance, corporate policy, and firm performance (e.g., Boone and White, 2015, and Appel, Gormley, and Keim, 2016). Demiralp et al. (2011) classify quasi-indexers as active institutional investors from a managerial and firm monitoring perspective. More importantly, quasi-indexers monitor firms through different channels from dedicated investors. Appel et al. (2016) show that quasi-indexers exert influence through their large voting blocs, such as showing less support for management proposals and more support for shareholder-initiated governance proposals, etc.

We now redo our main tests using dedicated and quasi-indexer institutional ownership. We compare the differential impact of CSR on firm value at the onset of the crisis between high and low influential IO groups. To do so, we re-estimate the regression models in Table 3 and 5, respectively.

[INSERT TABLE 7 ABOUT HERE]

Table 7 Panel A provides triple difference estimation results comparing the pre-crisis and crisis periods. The tests are essentially the same as in Table 3 except that the influential IO measures are now replaced by dedicated IO (in Model 1) and Quasi-indexer IO (in Model 2).

Consistent with our main findings in Table 3, the coefficient estimates on *CSR* are positive and significant using both the dedicated or quasi-indexer IO measures. The coefficients of the triple interaction term *CSR * Crisis * High IO* are positive and significant. For example, in the first model using the dedicated IO measure, the coefficient on the triple interaction term is

0.294 with a t-value of 2.75, suggesting that the change in Tobin's Q of CSR firms, net of change in Tobin's Q of non-CSR firms, from before to during the crisis period is significantly positive in the group with high dedicated IO. Same results hold for Model 2 when using quasi-indexer IO measure.

In addition, consistent with the findings in Table 3, results in Panel A show that the coefficient estimate on the interaction term $CSR * Crisis$ is significant and negative, suggesting that among low influential IO firms, the financial crisis hurts CSR firms more than non-CSR firms.

Moreover, consistent with results in Table 3, the coefficient on the interaction term $CSR * High IO$ is significant and negative, supporting the view that the conflict-resolving role of CSR is more important among firms with low institutional ownership than those with high IO.

Overall, our results support the findings in Boone and White (2015) and Appel, Gormley, and Keim (2016) in that quasi-indexers, as well as dedicated institutional investors, play a key role in influencing corporate governance.

Next, we examine whether influential institutional ownership, measured as dedicated and quasi-indexer IO, affects CSR-firm value after the crisis. Table 7 Panel B provides the triple difference estimation results for the crisis and post crisis periods. We apply the same model as in Table 5. The variable of interest is the triple interaction term $CSR * Post-crisis * High IO$.

Consistent with the findings in Table 5, the results in Panel B show an insignificant negative relation between Tobin's Q and the triple interaction term $CSR * Crisis * High IO$. The results suggest that there is little difference between high-IO and low-IO groups in the change of CSR firms' value, net of change of non-CSR firms' value, from the crisis to post-crisis period.

In sum, our main results are robust to the alternative measures of influential institutional ownership: dedicated and quasi-indexer IO.

4.7 Firm Value, CSR, Influential Institutional Ownership for Firms with Debt Maturing Right at the Onset of the Crisis

The financial crisis represents the largest exogenous external-financing shock to all firms, especially the one with high levels of debt maturing in 2007. Almeida et al. (2012) show that there is a substantial decrease in the availability of outside financing for firms starting in August 2007 through 2008. A growing literature (Cohn and Wardlaw, 2016; Almeida, Campello, Laranjeira, and Weisbenner, 2012) suggests that the firms that are affected the most are the ones with large portions of their long-term debt maturing right following the onset of the crisis (i.e., after the third quarter of 2007).

[INSERT TABLE 8 ABOUT HERE]

In Table 8, we focus on these firms since we expect the effects of CSR on value to be different for firms facing different levels of financial shocks. The intuition behind this analysis is that firms with a lot of debt maturing during the crisis find it more difficult to roll over maturing debt than other firms (He and Xiong, 2012). In addition, the presence of credit shock, interacted with an upcoming refinancing risks, will force firms to dramatically reduce their investment during the crisis (Almeida et al., 2012). In this situation, the costs of investing in or maintaining CSR engagement will extremely high.

We run a triple difference analysis on firms with debt maturing within one year of the 2007 fiscal year-end. Table 8 Panel A presents the estimation results for the pre-crisis and crisis periods. Consistent with the findings in Table 3, both the coefficients on the interaction terms *CSR * Crisis* and *CSR * High IO* are negative and significant across all models.

Different from the evidence in Table 3, the coefficients on the triple interaction term *CSR * Crisis * High IO* are not significant. The results suggest that following the onset of the crisis, high institutional ownership does not have an additional positive influence on the CSR-firm value relation for firms with debt maturing during the crisis.

One important reason is that corporate debt can distort firm investment, especially long-term investment, and lead to severe underinvestment (Hennessy, 2004). More importantly, the sample firms in this test face high refinancing or rollover risks. Such risks can increase the potential for underinvestment problems even with high institutional ownership (Aivazian, Ge, and Qiu, 2005; Almeida et al., 2012). In addition, debtholders such as short-term debtholders (usually banks) can play an active monitoring role and can decrease managerial agency costs (e.g., James, 1987; Lummer and McConnell, 1989; Rauh and Sufi, 2010). Therefore, during the crisis, the negative impact of refinancing risks and the monitoring role of short-term debtholders can overshadow the influence of high institutional ownership on CSR-firm value relation during the period. In untabulated results¹⁵, we find that high cash holdings and sales growth increase firm value for these firms, consistent with Harford et al. (2014).

In sum, our evidence indicates that refinancing risks during the crisis can subdue the positive impact of monitoring institutional investors on CSR-firm value relation.

Table 8 Panel B shows the triple difference analysis results for firms with debt maturing in one year by comparing the crisis and post-crisis period. The results are largely consistent with those in Table 5.

4.8 Regression Discontinuity Design: Firm Value, CSR, and Influential Institutional Ownership

¹⁵ Results are available upon request from the authors.

It is possible that the correlation between influential institutional ownership and firm value is not necessarily causal since both firm value and institutional IO can be driven by common factors, such as the firm's financial performance, investment opportunities, and other confounding factors.

To mitigate such concerns, we apply a regression discontinuity design.¹⁶ We focus on the variation in ownership that occurs around the cutoff point used to construct the Russell 1000 index and Russell 2000 index. Our approach is based on Chang, Hong and Liskovich (2014) and Appel, Gormley, and Keim (2016). In addition to our original sample requirements, we restrict our sample firms in the 250 bandwidth around the Russell 1000 cutoff. Due to the restrictions, we only have 41 CSR firms and 454 non-CSR firms. To guarantee a sufficient sample size, we do not match these CSR firm with non-CSR firms. Note that even without propensity score matching; the resulting sample firms have similar market size.

Specifically, we employ an instrumental variable approach to identify the effect of ownership, using the inclusion in Russell 2000 as an instrument for ownership. As in Appel, Gormley, and Keim (2016), we instrument for ownership measure by estimating the following first-stage estimation model:

$$IO_i = c_0 + c_1 * R2000_i + c_2 * \ln(Size_{i,May}) + c_3 * [\ln(Size_{i,May})]^2 + c_4 * [\ln(Size_{i,May})]^3 + c_5 * [\ln(Size_{i,June})] + u_{i,p} \quad (5)$$

where IO is measured at the end of first quarter of 2006. $R2000$ indicates the inclusion of the firm in Russell 2000 index at the end of June 2005. We also include firm's market capitalization on May 31, 2005 and on June 30, 2005.

Following Crane, Michenaud, and Weston (2016) and Appel, Gormley, and Keim (2016), we focus on dedicated ownership and quasi-indexer ownership for Model 1 and Model 2,

¹⁶ We thank the referee for suggesting this test.

respectively. According to Bushee (1998, 2001), by definition, dedicated investors hold stable and focused holdings, while quasi-indexers tend to passively track indexes. A stock's index assignment can significantly affect the extent of ownership by quasi-indexers and even dedicated institutional investors who use the Russell indexes as benchmarks to their performance.

In our second-stage model, we re-estimate equation 1 and 2 in Section 2. We define High- (Low-) IO firms based on the predicted IO values estimated from the first-stage regression. Since Russell 1000 and 2000 indexes are constructed only in terms of market capitalization on the last trading day of May, the predicted IO is less related to firm financial performance and other corporate outcomes. We present the second-stage regression results in Table 9.

[INSERT TABLE 9 ABOUT HERE]

Table 9 Panel A provides the triple-difference analysis results on firm Tobin's Q by comparing pre-crisis and crisis periods. The overall results are qualitatively similar but less significant. Consistent with the results in Table 7 Panel A, the coefficient on *CSR* is significantly positive and the coefficient on *Crisis* is significantly negative.

Focusing on the variable of interest $CSR * Crisis * High IO$, the coefficient on this interaction term is positive and in Model 1, consistent with our main findings that influential ownership has a positive impact on the relation between CSR and firm value during the crisis.

When applying the instrument quasi-indexer IO measure, the coefficient on the triple interaction term is positive but insignificant. It is possible that quasi-indexer holdings, after controlling for the factors that determines index design, have a low monitoring effect. However, it is also possible that there is not enough variation in the instrument quasi-indexer IO as there are only 41 CSR firms and 454 non-CSR firms.

Table 9 Panel B provides triple-difference analysis results on firm Tobin's Q by comparing crisis and post-crisis periods. The results are qualitatively similar to those in Table 7 Panel B except that the coefficient on *CSR* becomes insignificant, suggesting that *IO* does not exert much influence on *CSR*-firm value relation after the crisis. Again, the insignificant results can be due to the small sample size of *CSR* firms.

In summary, applying a Regression Discontinuity design, we find evidence to support our main findings that 1) among low influential *IO* group, *CSR* firms have higher firm value than non-*CSR* firms before the crisis; and 2) during the crisis, high influential *IO* has a positive impact on *CSR* value effect.

5. Conclusion

In this paper, we assess how *CSR* activity affects firm value. We treat the recent financial crisis as an exogenous shock to firms to disentangle the confounding association between *CSR* practices and firm value. Performing a difference-in-difference analysis, we find that influential institutional ownership significantly affects the relation between *CSR* practices and firm value.

We show that on average *CSR* firms exhibit higher firm value (Tobin's Q) than non-*CSR* firms prior to the financial crisis. However, following the onset of the crisis, *CSR* firms are hit harder in terms of firm value than other firms. Our findings suggest that the importance of the *CSR* overinvestment effect, relative to that of the *CSR* conflict-resolution effect, is time-variant. The overall *CSR* effect depends on which effect dominates under a specific economic condition.

In addition, we apply a triple difference (DDD) approach. We find that before the crisis *CSR* positively affects the value of low institutional ownership firms. However, we show that during the same pre-crisis period, the *CSR* effect is significantly lower for firms with high

influential IO than for firms with low IO. Our evidence implies that the CSR benefits low-IO firms more before the crisis.

However, when the crisis occurs, we document that high influential institutional holdings have positive influence on CSR-firm value relation. Specifically, we find that the change in Tobin's Q of CSR firms from the pre-crisis to crisis period, net of that of non-CSR firms, is significantly positive in the group with high influential IO. The results support the view that influential institutional ownership can play an important monitoring role in enhancing firm value, especially during the crisis when agency problems get worse.

To study how financial constraints influence the interaction among CSR, institutional ownership, and firm value, we focus on firms with debt maturing at the start of the financial crisis. Interestingly, we document an insignificant impact of influential institutional ownership on CSR-firm value relation when the crisis happens. Our results suggest that the negative impact of refinancing risks and the monitoring role of short-term debtholders subdue the positive impact of high institutional ownership on CSR-firm value relation during the crisis.

In sum, we find that the effect of CSR on firm value varies with the level of influential institutional ownership and depends on the economic condition. Our study contributes to ongoing research that gauges benefits and costs of CSR activity and provide investment implication for socially responsible investments.

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Table 1: Summary Statistics

This table presents summary statistics for our sample firms in the first quarter of 2006 that have an ESG score in 2007, before the 2008 financial crisis. To be included in our sample, a firm has to meet the following requirements. 1) The firm should be on the list of Russell 3000 index in 2007; 2) The firm should have data available in the Center for Research in Security Prices (CRSP) monthly and daily files, and Compustat Annual and Quarterly Industrial file (COMPUSTAT); 3) We exclude financial firms from our sample since these firms received substantial government assistance during the financial crisis. We then classify firms into two categories based on the firm ESG score. We define “*CSR Firm*” as one that has reported the ESG score as of the end of year 2006. Then we apply a propensity score matching approach to find comparable firms within their Russell 3000 index for each CSR Firm in two dimensions: firm size and industry. Industry is defined according to French’s 17 industry definitions. The details are available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. We follow Edmans, Fang, and Lewellen (2017) to construct quarterly accounting measures. *Tobin’s Q* at the end of quarter q is measured as the ratio of market value of assets at the end of quarter q divided by book value of assets at the end of quarter $q-1$. *Book Asset* is the book value of assets at the end of quarter q . *Sales growth rate* is calculated as sales in quarter q divided by sales in quarter $q-4$ minus one. *Capital expenditures/Book Asset* is the ratio of capital expenditures from quarter $q-1$ to q , scaled by total assets at the end of quarter $q-1$. *Fixed Asset/Book Asset* is the ratio of book value of property, plant, and equipment to book value of total assets, both measured at the end of quarter q . *Cash Holdings* is calculated as cash and short-term investments at the end of quarter q divided by total assets at the end of quarter q . *Book leverage* is defined as the ratio of total debt to total assets, both measured at the end of quarter q . *R&D Intensity* is the ratio of research and development expense to total book asset measured at the end of quarter $q-1$, with R&D set equal to zero when research and development expense is missing. *Profitability* is measured as the ratio of net income during quarter q to book value of total assets of quarter q . In addition, we follow Servaes and Tamayo (2013) to construct *Advertising Intensity*, calculated as annual advertising expenses to sales ratio. *Block Institutional Ownership (Block IO)* is measured as the percentage of a firm’s shares held by investors whose ownership is at least 5% of the firm’s shares. *Top Five Institutional Ownership (Top Five IO)* refers to the aggregate percentage of a firm’s shares held by the 5 largest institutional investors. *Long-term Institutional Ownership (Long-term IO)* is measured as the aggregate percentage of a firm’s shares held by long-term institutional investors. We define long-term institutional investors following Yan and Zhang (2009). We classify institutional investors into long-term investors according to portfolio turnover rates (or churn rates) over the past four quarters. The investors with a churn rate ranked in the bottom tercile are defined as long-term investors. Using the classification method in Bushee (2001) and Bushee and Noe (2000), we group institutional investors into Dedicated and Quasi-indexer investors. We then define *Dedicated Ownership (Dedicated IO)* and *Quasi-indexer Ownership (Quasi-indexer IO)* as the percentage of a firm’s shares held by Dedicated and Quasi-indexer investors, respectively. The variable definitions are provided in the Appendix. All continuous variables are winsorized at the 0.5% level. The difference between two categories of firms in means is tested by a two-tailed test.

Variables	CSR Firms mean	Matching Firms mean	P value of difference in means
Tobin's Q	1.90	1.44	0.000
Ln(Book Asset)	8.77	8.67	0.458
Sales Growth Rate	0.13	0.15	0.314
Capital Expenditure/Book Asset	0.05	0.06	0.695
Fixed Asset/Book Asset	0.29	0.31	0.292
Cash Holdings	0.13	0.12	0.103
Book Leverage	0.19	0.24	0.001
R&D Intensity	0.01	0.01	0.262
Profitability	0.02	0.01	0.000
Advertising Intensity	0.01	0.01	0.113
Block Ownership	0.15	0.22	0.000
Top Five Institutional Ownership	0.26	0.30	0.000
Long-term Institutional Ownership	0.20	0.19	0.584
Dedicated Institutional Ownership	0.07	0.07	0.470
Quasi-indexer Institutional Ownership	0.55	0.52	0.263
Number of Firms	261	261	

Table 2: Change in Firm Value Following the Onset of the Financial Crisis

The table reports coefficients estimated from the following difference-in-difference regression of Tobin's Q on the indicators of CSR Firm and Crisis (or Post-crisis) over the periods between 2006Q1 and 2007Q2 and between 2008Q3 and 2009Q1.

$$Tobin's Q_{i,t} = a_0 + a_1 CSR_{i,2006} + a_2 Crisis_t + a_3 CSR_{i,2006} * Crisis_t + A'X_{i,t-1} + \eta_{i,t}$$

The dependent variable, *Tobin's Q* at the end of quarter q, is measured as the ratio of the market value of assets at the end of quarter q divided by the book value of assets at the end of quarter q-1. *CSR* is set equal to one if a firm has reported an ESG score as of year 2006, and zero otherwise. *Crisis* is set equal to one if the time period is between 2008Q3 and 2009Q1 and equals zero otherwise. The detailed variable definitions are provided in Table 1 text and Appendix. All continuous variables are winsorized at the 0.5% level. The t-values in parenthesis are computed using robust standard errors. *, **, and *** indicate significance at 10, 5, and 1% levels, respectively.

Independent Variables	Model 1	Model 2
CSR	0.253*** (4.58)	0.252*** (4.75)
Crisis	-0.278*** (-6.75)	-0.295*** (-7.07)
CSR * Crisis	-0.150*** (-3.00)	-0.137*** (-2.70)
Ln(Book Asset)	-0.108*** (-6.63)	-0.100*** (-5.69)
Sales Growth Rate	0.261*** (3.05)	0.232*** (2.99)
Capital Expenditure/Book Asset	3.893*** (4.30)	4.481*** (5.04)
Fixed Asset/Book Asset	-0.311** (-2.18)	-0.423** (-2.55)
Cash Holdings	2.415*** (7.67)	2.441*** (8.14)
Book Leverage	0.001 (0.01)	-0.022 (-0.13)
R&D Intensity	18.750*** (5.50)	21.822*** (6.43)
Profitability	13.620*** (7.97)	13.184*** (8.82)
Advertising Intensity	4.187*** (3.92)	2.183** (1.98)
Industry Fixed Effects	No	Yes
R-square	0.506	0.543
N	6136	6136

Table 3: Interactions among Firm Value, CSR, Influential Institution Ownership Following the Onset of the Financial Crisis

The table reports coefficients estimated from the following triple differences regression of Tobin's Q on the indicators of CSR Firm, Crisis (or Post-crisis), and High (or low) Influential Institutional Ownership over the periods between 2006Q1 and 2007Q2 and between 2008Q3 and 2009Q1.

$$\text{Tobin's } Q_{i,t} = a_0 + a_1 \text{CSR}_{i,2006} + a_2 \text{Crisis}_t + a_3 \text{CSR}_{i,2006} * \text{Crisis}_t + a_4 \text{High-IO}_i + a_5 \text{CSR}_{i,2006} * \text{High-IO}_i + a_6 \text{Crisis}_t * \text{High-IO}_i + a_7 \text{CSR}_{i,2006} * \text{Crisis}_t * \text{High-IO}_i + A'X_{i,t-1} + \eta_{i,t}$$

The dependent variable, *Tobin's Q* at the end of quarter q, is measured as the ratio of market value of assets at the end of quarter q divided by book value of assets at the end of quarter q-1. *CSR* equals one if a firm has reported an ESG score in year 2006, and zero otherwise. *Crisis* equals to one if the time period is between 2008Q3 and 2009Q1 and equals to zero otherwise. *High (Low) IO* firms are those with values of Block Ownership, Top Five Institutional Ownership, and Long-term Institutional Ownership (IO), respectively, above (below) the sample median in any fiscal year. *Block Institutional Ownership (Block IO)* is measured as the percentage of a firm's shares held by investors whose ownership is at least 5% of the firm's shares. *Top Five Institutional Ownership (Top Five IO)* refers to the percentage of a firm's shares held by the 5 largest institutional investors. *Long-term Institutional Ownership (Long-term IO)* is measured as the aggregate percentage of a firm's shares held by long-term institutional investors. We define long-term institutional investors following Yan and Zhang (2009). We classify institutional investors into long-term investors according to portfolio turnover rates (or churn rates) over the past four quarters. The investors with a churn rate ranked in the bottom tercile are defined as long-term investors. The detailed variable definitions are provided in Table 1 legend and Appendix. All continuous variables are winsorized at the 0.5% level. The t-values in parenthesis are computed using robust standard errors. *, **, and *** indicate significance at 10, 5, and 1% levels, respectively.

Independent Variables	Model 1	Model 2	Model 3
	Block IO	Top Five IO	Long-term IO
CSR	0.347*** (4.12)	0.413*** (4.86)	0.280*** (3.47)
Crisis	-0.282*** (-4.87)	-0.263*** (-4.51)	-0.277*** (-5.63)
CSR * Crisis	-0.206*** (-2.94)	-0.244*** (-3.41)	-0.211*** (-3.02)
High IO	0.194* (1.65)	0.262 (0.75)	0.327*** (3.36)
CSR * High IO	-0.205* (-1.77)	-0.362*** (-3.24)	-0.230* (-1.81)
Crisis * High IO	-0.178* (-1.72)	-0.191* (-1.87)	-0.221*** (-2.77)
CSR * Crisis * High IO	0.213* (1.83)	0.221** (2.21)	0.266*** (2.62)
Controls	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
R-square	0.541	0.547	0.539
N	4146	4146	4146

Table 4: Recovery of Firm Value after the Financial Crisis

The table reports coefficients estimated from the following difference-in-difference regression of Tobin's Q on the indicator of CSR Firm and Crisis (or Post-crisis) over the periods between 2008Q3 and 2009Q1 and between 2010Q1 and 2010Q4.

$$\text{Tobin's } Q_{i,t} = b_0 + b_1 \text{CSR}_{i,2006} + b_2 \text{Post-crisis}_t + b_3 \text{CSR}_{i,2006} * \text{Post-crisis}_t + B'X_{i,t-1} + e_{i,t}$$

The dependent variable, *Tobin's Q* at the end of quarter q, is measured as the ratio of market value of assets at the end of quarter q divided by book value of assets at the end of quarter q-1. *CSR* equals one if a firm has reported an ESG score in year 2006, and zero otherwise. *Post-crisis* equals one if the time period is between 2010Q1 and 2010Q4 and equals to zero otherwise. The detailed variable definitions are provided in Table 1 legend and Appendix. All continuous variables are winsorized at the 0.5% level. The t-values in parenthesis are computed using robust standard errors. *, **, and *** indicate significance at 10, 5, and 1% levels, respectively.

Independent Variables	Model 1	Model 2
CSR	0.145*** (2.89)	0.151*** (3.05)
Post-crisis	0.132*** (3.70)	0.139*** (4.03)
CSR * Post-crisis	0.035 (0.91)	0.030 (0.79)
Ln(Book Asset)	-0.102*** (-6.23)	-0.098*** (-5.29)
Sales Growth Rate	0.018 (0.22)	0.065 (0.81)
Capital Expenditure/Book Asset	1.820** (2.10)	2.288*** (2.74)
Fixed Asset/Book Asset	-0.022 (-0.14)	-0.115 (-0.67)
Cash Holdings	1.921*** (5.59)	1.929*** (5.58)
Book Leverage	0.164 (0.98)	0.102 (0.58)
R&D Intensity	13.037*** (3.77)	15.793*** (4.31)
Profitability	11.443*** (6.78)	10.727*** (6.81)
Advertising Intensity	4.118*** (3.38)	2.714** (2.17)
Industry Fixed Effects	No	Yes
R-square	0.399	0.435
N	3080	3080

Table 5: Interactions among Firm Value, CSR, Influential Institution Ownership after the Financial Crisis

The table reports coefficients estimated from the following triple differences regression of Tobin's Q on the indicators of CSR Firm, Crisis (or Post-crisis), and High (or low) Influential Institutional Ownership for the periods between 2008Q3 and 2009Q1 and between 2010Q1 and 2010Q4.

$$\text{Tobin's } Q_{i,t} = b_0 + b_1 \text{CSR}_{i,2006} + b_2 \text{Post-crisis}_t + b_3 \text{CSR}_{i,2006} * \text{Post-crisis}_t + b_4 \text{High-IO}_i + b_5 \text{CSR}_{i,2006} * \text{High-IO}_i + b_6 \text{Post-crisis}_t * \text{High-IO}_i + b_7 \text{CSR}_{i,2006} * \text{Post-crisis}_t * \text{High-IO}_i + B'X_{i,t-1} + e_{i,t}$$

The dependent variable, *Tobin's Q*, is measured as the ratio of the market value of assets at the end of quarter q divided by book value of assets at the end of quarter q-1. *CSR* is equal to one if the firm has reported an ESG score as of year 2006, and zero otherwise. *Post-crisis* equals one if the time period is between 2010Q1 and 2010Q4 and equals zero otherwise. *High (Low) IO* firms are those with values of Block Ownership, Top Five Institutional Ownership, and Long-term Institutional Ownership (IO), respectively, above (below) the sample median at the beginning of 2006. *Block Institutional Ownership (Block IO)* is measured as the aggregate percentage of a firm's shares held by investors whose ownership is at least 5% of the firm's shares. *Top Five Institutional Ownership (Top Five IO)* refers to the aggregate percentage of a firm's shares held by the 5 largest institutional investors. *Long-term Institutional Ownership (Long-term IO)* is measured as the aggregate percentage of a firm's shares held by long-term institutional investors. We define long-term institutional investors based upon Yan and Zhang (2009). We classify institutional investors into long-term investors according to portfolio turnover rates (or churn rates) over the past four quarters. The investors with a churn rate ranked in the bottom tercile are defined as long-term investors. The detailed variable definitions are provided in Table 1 legend and Appendix. All continuous variables are winsorized at the 0.5% level. The t-values in parenthesis are computed using robust standard errors. *, **, and *** indicate significance at 10, 5, and 1% levels, respectively.

	Model 1	Model 2	Model 3
Independent Variables	Block IO	Top Five IO	Long-term IO
CSR	0.206*** (2.63)	0.235*** (2.92)	0.138** (2.04)
Post-crisis	0.146*** (2.98)	0.142*** (2.92)	0.111** (2.44)
CSR * Post-crisis	-0.012 (-0.23)	0.009 (0.17)	0.051 (0.90)
High IO	-0.043 (-0.56)	-0.031 (-0.39)	0.032 (0.44)
CSR * High IO	-0.061 (-0.57)	-0.135 (-1.25)	0.088 (0.91)
Post-crisis * High IO	-0.025 (-0.43)	-0.016 (-0.27)	0.034 (0.62)
CSR * Post-crisis * High IO	-0.020 (-0.25)	-0.073 (-0.92)	-0.097 (-1.64)
Controls	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
R-square	0.439	0.445	0.437
N	3050	3050	3050

Table 6: Firm Value and Stock Returns Surrounding the 2008 Crisis

The table reports the results of the following models over the periods between 2006 January and 2010 December.

$$\text{Model 1 (quarterly): } \text{Tobin's } Q_{i,t} = a_0 + a_1 \text{CSR}_{i,2006} * \text{Shock}_t + a_2 \text{CSR}_{i,2006} * \text{Crisis}_t + a_3 \text{CSR}_{i,2006} * \text{Post-crisis}_t \\ + A'X_{i,t-1} + \text{Year-quarter Time Dummies} + \text{Firm Fixed Effects} + \eta_{i,t}$$

$$\text{Model 2 (monthly): } \text{Return}_{i,t} = b_0 + b_1 \text{CSR}_{i,2006} * \text{Shock}_t + b_2 \text{CSR}_{i,2006} * \text{Crisis}_t + b_3 \text{CSR}_{i,2006} * \text{Post-crisis}_t \\ + B'Z_{i,t-1} + \text{Year-quarter Time Dummies} + \text{Firm Fixed Effects} + e_{i,t}$$

Tobin's $Q_{i,t}$ is measured as the ratio of market value of assets at the end of quarter q divided by book value of assets at the end of quarter $q-1$. $\text{Return}_{i,t}$ is the raw stock return in month t . CSR equals to one if the firm has reported an ESG score as of year 2006, and zero otherwise. Shock is a dummy variable that indicates a shock to the credit supply between July 2007 and July 2008. Crisis is a dummy variable that is equal to 1 if the time period is between August 2008 and March 2009 and zero otherwise. Post-crisis is a dummy variable that is equal to 1 if the time period is between April 2009 and December 2010 and zero otherwise. $X_{i,t-1}$ is a vector of control variables that help explain firm Tobin's Q . $Z_{i,t-1}$ is a vector of control variables that help explain stock returns. All variables are winsorized at the 0.5% level. The t -values in parenthesis are computed using heteroscedasticity consistent standard errors, clustered at the firm level. *, **, and *** indicate significance at 10, 5, and 1% levels, respectively.

Independent Variables	Model 1: Tobin's Q	Model 2: Return
CSR * Shock	0.024 (1.29)	1.548*** (2.87)
CSR * Crisis	-0.072*** (-3.17)	3.065*** (3.04)
CSR * Post-crisis	-0.009 (-0.53)	0.683 (1.11)
Controls	Ln(Book Asset); Sales Growth Rate; Capital Expenditure/Book Asset; Fixed Asset/Book Asset; Cash Holdings; Book Leverage; R&D Intensity; Profitability; Advertising Intensity	Ln(Market Capitalization); log(Book-to-Market Ratio); R_{t-12} ; R_{t-1} ; Liquidity; Investment-to-Asset Ratio; ROE; Cash Flow Volatility; R&D/Sales; Cash Holdings; Idiosyncratic Risk; Five Factor Loadings
Firm fixed effects	Yes	Yes
Time (monthly) fixed effects	Year-quarter fixed effects	Year-month fixed effects
Standard errors clustered by	Firm	Firm
Industry Fixed Effects	No	Yes
R-square	0.423	0.349
N	9158	14990

Table 7: Firm Value, CSR, Dedicated and Quasi-indexer Ownership

The table reports coefficients estimated from triple difference regressions of Tobin's Q on the indicator of CSR Firm, Crisis (or Post-crisis), and High (or low) Dedicated Ownership and Quasi-indexer Ownership. Panel A reports the following model estimation over the periods between 2006Q1 and 2007Q2 and between 2008Q3 and 2009Q1:

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & a_0 + a_1 \text{CSR}_{i,2006} + a_2 \text{Crisis}_t + a_3 \text{CSR}_{i,2006} * \text{Crisis}_t + a_4 \text{High-IO}_i + a_5 \text{CSR}_{i,2006} * \text{High-IO}_i \\ & + a_6 \text{Crisis}_t * \text{High-IO}_i + a_7 \text{CSR}_{i,2006} * \text{Crisis}_t * \text{High-IO}_i + A'X_{i,t-1} + \eta_{i,t} \end{aligned}$$

Panel B reports the following model estimation over the periods between 2008Q3 and 2009Q1 and between 2010Q1 and 2010Q4:

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & b_0 + b_1 \text{CSR}_{i,2006} + b_2 \text{Post-crisis}_t + b_3 \text{CSR}_{i,2006} * \text{Post-crisis}_t + b_4 \text{High-IO}_i + b_5 \text{CSR}_{i,2006} * \text{High-IO}_i \\ & + b_6 \text{Post-crisis}_t * \text{High-IO}_i + b_7 \text{CSR}_{i,2006} * \text{Post-crisis}_t * \text{High-IO}_i + B'X_{i,t-1} + e_{i,t} \end{aligned}$$

The dependent variable, *Tobin's Q* is measured as the ratio of market value of assets at the end of quarter q divided by book value of assets at the end of quarter q-1. *CSR* equals one if the firm has reported an ESG score as of year 2006, and zero otherwise. *Crisis* equals one if the time period is between 2008Q3 and 2009Q1 and equals zero otherwise. *Post-crisis* is a dummy variable that is equal to 1 if the time period is between April 2009 and December 2010 and zero otherwise. *High- (Low-) IO* firms are those with values of Dedicated Ownership and Quasi-indexer Ownership, respectively, above (below) the sample median at the beginning of 2006. Using the classification method in Bushee (2001) and Bushee and Noe (2000), we group institutional investors into Dedicated and Quasi-indexer investors. We then define *Dedicated Ownership (Dedicated IO)* and *Quasi-indexer Ownership (Quasi-indexer IO)* as the percentage of a firm's shares held by Dedicated and Quasi-indexer investors, respectively. The detailed variable definitions are provided in Table 1 legend and Appendix. All continuous variables are winsorized at the 0.5% level. The t-values in parenthesis are computed using robust standard errors. *, **, and *** indicate significance at 10, 5, and 1% levels, respectively.

Panel A: Firm Value, CSR, and Dedicated and Quasi-indexer Ownership: 2008 Financial Crisis

Independent Variables	Model 1	Model 2
	Dedicated IO	Quasi-indexer IO
CSR	0.395*** (4.36)	0.418*** (5.37)
Crisis	-0.246*** (-5.11)	-0.232*** (-4.82)
CSR * Crisis	-0.300*** (-4.11)	-0.242*** (-3.70)
High IO	0.176** (2.20)	0.227*** (3.01)
CSR * High IO	-0.242** (-2.01)	-0.268** (-2.42)
Crisis * High IO	-0.133* (-1.65)	-0.147** (-1.99)
CSR * Crisis * High IO	0.294*** (2.75)	0.191* (1.92)
Controls	Yes	Yes
Industry Fixed Effects	Yes	Yes
R-square	0.540	0.540
N	4146	4146

Panel B: Firm Value, CSR, and Dedicated and Quasi-indexer Ownership: Post 2008 Financial Crisis

Independent Variables	Model 1	Model 2
	Dedicated IO	Quasi-indexer IO
CSR	0.202** (2.32)	0.247*** (3.86)
Post-crisis	0.170*** (4.06)	0.105** (2.37)
CSR * Post-crisis	0.039 (0.65)	0.006 (0.12)
High IO	0.076 (0.99)	0.131* (1.87)
CSR * High IO	-0.047 (-0.41)	-0.112 (-1.15)
Post-crisis * High IO	-0.099* (-1.76)	0.046 (0.81)
CSR * Post-crisis * High IO	-0.060 (-0.77)	-0.037 (-0.48)
Controls	Yes	Yes
Industry Fixed Effects	Yes	Yes
R-square	0.432	0.434
N	3050	3050

Table 8: Firm Value, CSR, Influential Institutional Ownership for Firms with Debt Maturing Right at the Onset of the Crisis

The table reports triple difference regression results on sample firms with debt maturing within one year of the 2007 fiscal year-end. Panel A reports the following model estimation over the periods between 2006Q1 and 2007Q2 and between 2008Q3 and 2009Q1.

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & a_0 + a_1 \text{CSR}_{i,2006} + a_2 \text{Crisis}_t + a_3 \text{CSR}_{i,2006} * \text{Crisis}_t + a_4 \text{High-IO}_i + a_5 \text{CSR}_{i,2006} * \text{High-IO}_i \\ & + a_6 \text{Crisis}_t * \text{High-IO}_i + a_7 \text{CSR}_{i,2006} * \text{Crisis}_t * \text{High-IO}_i + A'X_{i,t-1} + \eta_{i,t} \end{aligned}$$

Panel B reports the following model estimation over the periods between 2008Q3 and 2009Q1 and between 2010Q1 and 2010Q4:

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & b_0 + b_1 \text{CSR}_{i,2006} + b_2 \text{Post-crisis}_t + b_3 \text{CSR}_{i,2006} * \text{Post-crisis}_t + b_4 \text{High-IO}_i + b_5 \text{CSR}_{i,2006} * \text{High-IO}_i \\ & + b_6 \text{Post-crisis}_t * \text{High-IO}_i + b_7 \text{CSR}_{i,2006} * \text{Post-crisis}_t * \text{High-IO}_i + B'X_{i,t-1} + e_{i,t} \end{aligned}$$

The dependent variable, *Tobin's Q* is measured as the ratio of market value of assets at the end of quarter q divided by book value of assets at the end of quarter q-1. *CSR* equals one if the firm has reported an ESG score as of year 2006, and zero otherwise. *Crisis* equals one if the time period is between 2008Q3 and 2009Q1 and equals zero otherwise. *Post-crisis* is a dummy variable that is equal to 1 if the time period is between April 2009 and December 2010 and zero otherwise. *High (Low) IO* firms are those with values of Block Ownership, Top Five Institutional Ownership, and Long-term Institutional Ownership (IO), respectively, above (below) the sample median at the beginning of 2006. *Block Institutional Ownership (Block IO)* is measured as the percentage of a firm's shares held by investors whose ownership is at least 5% of the firm's shares. *Top Five Institutional Ownership (Top Five IO)* refers to the percentage of a firm's shares held by the 5 largest institutional investors. *Long-term Institutional Ownership (Long-term IO)* is measured as the percentage of a firm's shares held by long-term institutional investors. We define long-term institutional investors following Yan and Zhang (2009). We classify institutional investors into long-term investors according to portfolio turnover rates (or churn rates) over the past four quarters. The investors with a churn rate ranked in the bottom tercile are defined as long-term investors. The detailed variable definitions are provided in Table 1 legend and Appendix. All continuous variables are winsorized at the 0.5% level. The t-values in parenthesis are computed using robust standard errors. *, **, and *** indicate significance at 10, 5, and 1% levels, respectively.

Panel A: Firm Value, CSR, and Influential Institutional ownership: 2008 Financial Crisis

	Model 1	Model 2	Model 3
Independent Variables	Block IO	Top Five IO	Long-term IO
CSR	0.317*** (4.24)	0.340*** (4.40)	0.227*** (3.20)
Crisis	-0.263*** (-5.08)	-0.264*** (-5.12)	-0.249*** (-5.31)
CSR * Crisis	-0.150** (-2.41)	-0.167*** (-2.65)	-0.176*** (-2.74)
High IO	0.123 (1.59)	0.106 (1.39)	0.192*** (2.69)
CSR * High IO	-0.198* (-1.79)	-0.265** (-2.43)	-0.196* (-1.66)
Crisis * High IO	-0.020 (-0.29)	-0.019 (-0.28)	-0.047 (-0.68)
CSR * Crisis * High IO	-0.002 (-0.03)	0.047 (0.53)	0.060 (0.66)
Controls	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
R-square	0.516	0.517	0.520
N	3462	3462	3462

Panel B: Firm Value, CSR, and Influential institutional ownership: Post 2008 Financial Crisis

	Model 1	Model 2	Model 3
Independent Variables	Block IO	Top Five IO	Long-term IO
CSR	0.230*** (3.09)	0.231*** (3.09)	0.120** (2.06)
Post-crisis	0.103*** (2.64)	0.107*** (2.75)	0.075** (2.21)
CSR * Post-crisis	0.032 (0.70)	0.032 (0.69)	0.057 (1.15)
High IO	-0.003 (-0.04)	0.018 (0.25)	0.146** (2.23)
CSR * High IO	-0.200* (-1.94)	-0.204* (-1.96)	-0.185* (-1.69)
Post-crisis * High IO	-0.025 (-0.58)	-0.032 (-0.72)	0.002 (0.05)
CSR * Post-crisis * High IO	-0.011 (-0.17)	-0.013 (-0.19)	-0.097 (-1.57)
Controls	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
R-square	0.433	0.431	0.430
N	2574	2574	2574

Table 9: Regression Discontinuity Design: Firm Value, CSR, and Influential Institutional Ownership

This table reports estimates for the second-stage regression of our instrumental variable estimation used to identify the effect of influential institutional ownership on CSR-Firm value effect. Specifically, we estimate the following regressions.

Panel A reports the following model estimation over the periods between 2006Q1 and 2007Q2 and between 2008Q3 and 2009Q1:

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & a_0 + a_1 \text{CSR}_{i,2006} + a_2 \text{Crisis}_t + a_3 \text{CSR}_{i,2006} * \text{Crisis}_t + a_4 \text{High-IO}_i^{\wedge} + a_5 \text{CSR}_{i,2006} * \text{High-IO}_i^{\wedge} \\ & + a_6 \text{Crisis}_t * \text{High-IO}_i^{\wedge} + a_7 \text{CSR}_{i,2006} * \text{Crisis}_t * \text{High-IO}_i^{\wedge} + A'X_{i,t-1} + \eta_{i,t} \end{aligned}$$

Panel B reports the following model estimation over the periods between 2008Q3 and 2009Q1 and between 2010Q1 and 2010Q4:

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & b_0 + b_1 \text{CSR}_{i,2006} + b_2 \text{Post-crisis}_t + b_3 \text{CSR}_{i,2006} * \text{Post-crisis}_t + b_4 \text{High-IO}_i^{\wedge} + b_5 \text{CSR}_{i,2006} * \text{High-IO}_i^{\wedge} \\ & + b_6 \text{Post-crisis}_t * \text{High-IO}_i^{\wedge} + b_7 \text{CSR}_{i,2006} * \text{Post-crisis}_t * \text{High-IO}_i^{\wedge} + B'X_{i,t-1} + e_{i,t} \end{aligned}$$

The dependent variable, *Tobin's Q* at the end of quarter *q*, is measured as the ratio of market value of assets at the end of quarter *q* divided by book value of assets at the end of quarter *q-1*. *CSR* equals one if the firm has reported an ESG score as of year 2006, and zero otherwise. *Crisis* equals one if the time period is between 2008Q3 and 2009Q1 and equals zero otherwise. *Post-crisis* is a dummy variable that is equal to 1 if the time period is between April 2009 and December 2010 and zero otherwise. *High IO* firms refer to firms with values of predicted Dedicated Ownership (Dedicated IO) and Quasi-indexer Ownership (Quasi-indexer IO), respectively, above (below) the sample median at the beginning of 2006. The predicted IO is estimated from the first-stage regression of our instrumental variable estimation as the following regression in 2006Q1.

$$\begin{aligned} \text{Influential IO}_i = & c_0 + c_1 * R2000_i + c_2 * \text{Ln}(\text{Size}_{i,\text{May}}) + c_3 * [\text{Ln}(\text{Size}_{i,\text{May}})]^2 + c_4 * [\text{Ln}(\text{Size}_{i,\text{May}})]^3 + c_5 * [\text{Ln}(\text{Size}_{i,\text{June}})] \\ & + u_{i,t} \end{aligned}$$

We measure *Influential IO* as Dedicated Ownership (Dedicated IO) and Quasi-indexer Ownership (Quasi-indexer IO) for Model 1 and Model 2, respectively. Dedicated Ownership and Quasi-indexer Ownership, respectively, are above (below) the sample median in any fiscal year. Using the classification method in Bushee (2001) and Bushee and Noe (2000), we group institutional investors into Dedicated and Quasi-indexer investors. We then define *Dedicated Ownership (Dedicated IO)* and *Quasi-indexer Ownership (Quasi-indexer IO)* as the percentage of a firm's shares held by Dedicated and Quasi-indexer investors, respectively. *R2000* indicates the inclusion in Russell 2000 index at the end of June. *Size_{i,May}* refers to the market equity value of firm *i* on May 31, 2005. *Size_{i,June}* refers to the market equity value of firm *i* on June 30, 2005. The detailed variable definitions are provided in Table 1 legend and Appendix. All continuous variables are winsorized at the 0.5% level. The t-values in parenthesis are computed using robust standard errors. *, **, and *** indicate significance at 10, 5, and 1% levels, respectively.

Panel A: Regression Discontinuity Test: 2008 Financial Crisis

	Model 1	Model 2
Independent Variables	Dedicated IO	Quasi-indexer IO
CSR	0.182* (1.67)	0.200* (1.80)
Crisis	-0.279*** (-7.20)	-0.303*** (-7.74)
CSR * Crisis	-0.083 (-0.88)	-0.040 (-0.41)
High IO	0.064 (1.25)	0.040 (0.83)
CSR * High IO	-0.052 (-0.34)	-0.182 (-1.23)
Crisis * High IO	-0.027 (-0.50)	-0.026 (-0.50)
CSR * Crisis * High IO	0.279* (1.88)	0.198 (1.38)
Controls	Yes	Yes
Industry Fixed Effects	Yes	Yes
R-square	0.540	0.540
N	3086	3086

Panel B: Regression Discontinuity Test: 2008 Financial Crisis

Independent Variables	Model 1	Model 2
	Dedicated IO	Quasi-indexer IO
CSR	0.068 (0.55)	0.155 (1.45)
Post-crisis	0.253*** (7.19)	0.245*** (5.92)
CSR * Post-crisis	0.055 (0.45)	0.094 (0.81)
High IO	-0.047 (-0.84)	0.031 (0.61)
CSR * High IO	0.162 (0.90)	-0.012 (-0.06)
Post-crisis * High IO	-0.041 (-0.75)	-0.021 (-0.40)
CSR * Post-crisis * High IO	-0.169 (-1.03)	-0.253 (-1.54)
Controls	Yes	Yes
Industry Fixed Effects	Yes	Yes
R-square	0.529	0.525
N	2744	2744

Appendix: Variable Definition**CSR:**

An indicator that equals one if the firm has reported ESG score as of year 2006

Crisis:

A dummy that equals one if the time period is between 2008Q3 and 2009Q1 and equals zero otherwise.

Post-crisis

A dummy variable set equal to 1 if the time period is between April 2009 and December 2010 and zero otherwise.

Tobin's Q:

It is calculated as market value of equity plus liquidating value of preferred stock plus book value of debt minus balance sheet deferred taxes and investment tax credit divided by total assets at the end of quarter $q-1$. Market value of equity is defined as number of shares outstanding multiplied by stock price at the end of fiscal quarter.

Top 5 Institutional Ownership:

The percentage of shares in a firm held by its top five institutional investors with highest amount of holdings. The data source is from Thomson Financial CDA/Spectrum 13f institutional holdings data.

Block holder Ownership:

The percentage of shares in a firm held by its block holders, the institutions with at least 5% ownership. The data source is from Thomson Financial CDA/Spectrum 13f institutional holdings data.

Long-term IO:

The percentage of shares in a firm held by its long-term institutional investors. We follow Yan and Zhang (2009) and define short-term and long-term institutional investors according to past portfolio turnover rates (or churn rates).

Dedicated Ownership and Quasi-indexer Ownership:

The percentage of a firm's shares held by Dedicated and Quasi-indexer investors, respectively, where Dedicated and Quasi-indexer investors are defined using classification method in Bushee (2001) and Bushee and Noe (2000).

Advertising Intensity:

Ratio of annual advertising expenses to sales ratio.

Book Asset:

Book value of asset at the end of quarter q .

Book leverage:

The ratio of total debt to total assets.

Book-to-Market Ratio

The book-to-market ratio is estimated using the book equity value of the fiscal year ending in year $t-1$ divided by the market capitalization of the stock at the end of December year $T-1$. Observations with a negative book equity value are excluded.

Capital expenditures/ Book Asset:

Ratio of capital expenditures from quarter $q-1$ to q , scaled by total assets at the end of quarter $q-1$.

Cash Holdings:

It is calculated as cash and short-term investments at the end of quarter $q-1$ divided by total assets at the end of quarter $q-1$.

Cash Flow Volatility

We follow Titman, Wei, and Xie (2004) to estimate a firm's cash flows, which is scaled by total assets, as operating income before depreciation minus interest expenses, taxes, preferred dividends, and common dividends. The cash flow volatility is defined as the standard deviation of a firm's cash flows over the past ten years.

Factor Loadings:

We estimate factor loadings based on the Fama and French (2015) five-factor model estimated using month dates over the past five year rolling windows

Fixed Asset/ Book Asset:

Ratio of book value of property, plant, and equipment to the book value of total assets, both measured at the end of quarter q .

Idiosyncratic Risk

It is computed as the residual variance from the market model estimated using daily stock returns over one month, following Ange, Xing, and Zhang (2006).

Illiquidity

It is the log value of the average of the daily Amihud illiquidity measures, which is equal to the absolute value of the daily return divided by daily volume (in million dollars).

Investment-to-Asset Ratio:

It is the annual change in total assets divided by one-year-lagged total assets.

Market Capitalization

The market value of outstanding shares, which equals to stock price per share multiplying the number of shares outstanding.

Market value of equity:

It is defined as number of shares outstanding multiplied by stock price at the end of fiscal year. Sales growth rate is the ratio of previous year's sales to current year's sales minus one.

Past Cumulative Returns ($R_{t-12, t-2}$)

The compounded rate of return from month $t - 12$ to $t - 2$.

Profitability:

Ratio of operating income before depreciation to the book value of total assets.

R&D Intensity:

Ratio of research and development expense to total book asset measured at the end of quarter $q-1$, with R&D set equal to zero when research and development expense is missing.

Return_t:

Raw stock return in month t .

ROA:

Return on asset is measured as the ratio of net income during quarter q to the book value of total assets of quarter q .

ROE:

Return on equity is income before extraordinary items divided by one-quarter-lagged book equity.

Sales growth rate:

The ratio of previous year's sales to current year's sales minus one.

Highlights

- Institutional ownership and rollover risks can have a non-trivial influence on the CSR-firm value relation.
- We show that CSR firms have higher firm value than non-CSR firms before the financial crisis. However, CSR firms are hit harder during the crisis, which supports the overinvestment hypothesis.
- Our findings indicate that the importance of the CSR overinvestment effect, relative to that of the CSR conflict-resolution effect, is time-variant. We find that the importance of the CSR conflict-resolution effect and overinvestment effect varies with economic conditions.
- The negative impact of refinancing risks on firm value eclipses the positive impact of high institutional ownership on CSR-firm value effect during the crisis.
- We find that influential institutional ownership significantly affects the relation between CSR practices and firm value.