

The Impact of Corporate Social Responsibility on CEO relative leverage

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Abstract

We empirically investigate how U.S. firms' corporate social responsibility (CSR) engagement affects CEO relative leverage. Using a sample period from 2006 to 2008, we find that CSR engagement positively affects CEO relative leverage after controlling for various firm and board characteristics. This finding suggests firms that are more socially responsible pay out debt-like compensation to motivate CEOs to resolve conflicts between stakeholders. We also find a positive association between employee relations and CEO relative leverage. Using 2SLS and PSM methods, we discover that our results are robust to the correction for endogeneity. Overall, consistent with Cai, Jo, and Pan (2011), our results support the conflict-resolution hypothesis based on stakeholder theory rather than the CSR overinvestment argument based on agency theory.

Introduction

In spite of an increasing number of firms that engage serious efforts to integrate CSR into various aspects of their business, defining CSR is still a controversial issue. According to Friedman (1970), business is “to make as much money as possible while conforming to the basic rules of society, both those embodied in the law and those embodied in ethical custom.” This statement indicates that generating profits, obeying to the law, and following ethical custom embrace three areas including economic, legal, and ethical aspects of the corporate social performance. Also, Carroll (1991) argues that four types of social responsibilities constitute total CSR: economic, legal, ethical, and philanthropic. In other words, socially responsible firms should maximize profit, conform to the law, be ethical, and be a good corporate citizen. Therefore, socially responsible firms positively influence the society that includes people, communities, and environment in ways that go beyond the law and financial support. Overall, CSR is an extension of a firm’s efforts to foster sustainability via sound business practices.

A large body of literature has attracted much recent attention by the sharp increase in CEO debt-like compensations. For instance, Anantharaman, Fang, and Gong (2013) report that the accumulated pension and deferred compensation benefits of S&P 1500 firms in the United States amounted to around 25% of their equity-based compensation in 2007 and 43% in 2008. The CEO debt-like compensations can be an alternative solution to resolve the widening pay disparity that has raised both ethical concerns and economic questions from investors and regulators in past decades since it is considered as long-term compensation (Edmans and Liu 2010). According to Jensen and Meckling (1976), CEO debt-like compensations can alleviate conflicts between shareholders and debtholders because the compensation policy motivates managers to lean toward the interest of debtholders, rather than that of shareholders, thereby lowering the risk-taking behaviors.

Prior literatures have acknowledged empirical firms’ impact of CSR involvement on executive compensations. Cai, Jo, and Pan (2011), for instance, take two representative explanations—overinvestment based on agency theory versus conflict-resolution based on stakeholder theory—to determine their relative importance in CSR-executive compensation relations. Under the overinvestment hypothesis, investing in CSR could potentially harm firm value, while under the conflict-resolution hypothesis, firms optimally invest in CSR to maximize value by mitigating the potential conflicts among various stakeholders. The results show that the lag of CSR adversely affects both total compensation and cash compensation. Their estimates indicate that an interquartile increase in CSR is followed by a 4.35% decrease in total compensation and 2.78% decrease in cash compensation.

In this article, we ask if socially responsible firms have more tendencies to pay CEO relative leverage to resolve conflicts between stakeholders than socially irresponsible ones. To extend Cai, Jo, and Pan (2011)'s work, we empirically investigate how the U.S. firms' CSR engagement affects CEO's debt-like compensation policy. However, their definition of total compensation is quite complicated and vague since it consists of summation from all different types of compensation such as salary, bonus, total value of restricted stock granted that year, and long-term incentive payouts. To avoid complexity that comes from all sorts of compensation, we are focusing on the CEO's relative leverage, which is constructed as the CEO's debt-to-equity ratio scaled by the firm's debt-to equity ratio. Supporting conflict-resolution hypothesis, we believe that firms that are socially responsible pay out higher inside debt for CEOs compared to firms that are not.

Using a sample of 1,038 firm-year observations during the period of 2006–2008, our results show that firms that are more socially responsible pay more CEO relative leverage than those that are socially irresponsible after controlling for various firm and corporate governance characteristics. In addition, we find that the observed positive association between CSR and CEO relative leverage mostly comes from employee relations. The positive associations between CEO relative leverage and lagged CSR as well as employee relations' dimension in CSR remain statistically significant even when we control for potential endogeneity using 2SLS and PSM approaches.

The contributions of this research are as follows. First, our new CSR-compensation causation can shed additional light on the issue of how socially responsible firms determine their executive compensation differently from socially irresponsible firms. To the best of our knowledge, this is the first paper that has ever investigated a robust positive relation between lagged CSR and CEO relative leverage. Second, our findings emphasize that socially responsible firms put devotion by paying out CEO relative leverage. It is to reduce compensation disparity between executive and employee and to increase employees' job satisfactions. Finally, similar to Cai, Jo, and Pan (2011), the positive relations between CEO relative leverage and lagged CSR support the conflict–resolution hypothesis.

The remainder of the paper is organized as follows. The following section provides an overview of literature review and our hypothesis developments. Our measurements and research design will be in the next section. Then, we present the empirical results and robustness checks. The final section presents a discussion of our findings and summarizes the key findings.

Literature review and Hypotheses

CSR and Stakeholder theory

Alliance with stakeholders through CSR activities is one of the key components of firm's

future growth (Donaldson and Preston 1995; McWilliams and Siegel 2001). For instance, Jones (1995) enhances the stakeholder theory by developing model that integrates economic theory and ethics, and find that firms conducting stakeholder's trust commit to ethical behaviors achieve a competitive advantage. Based on the stakeholder theory, the extension of CSR literatures supports conflict-resolution hypothesis. According to McWilliams and Siegel (2001), managers continually encounter pressures from multiple stakeholder groups including customers, employees, suppliers, community groups, governments, and institutional shareholders, to devote resources to CSR to solve conflict between stakeholders.

Similar to McWilliams and Siegel (2001), for sustaining the reputational capital, the managers are less likely to engage in aggressive earning management (Chih, Shen, and Kang 2008), executive's Securities Exchange Commission (SEC) violation, and their excess compensations (Kim, Park, and Wier 2012; Ferrell, Liang, and Renneboog 2016), and release better quality of non-financial information than non-CSR firms (Dhaliwal et al. 2011; Gao and Zhang 2015; Lys, Naughton, and Wang 2015). For instance, socially responsible firms improve corporate transparency through frequent voluntary disclosure, reduce the information asymmetry between insiders and outsiders, discourage managerial self-dealings, and therefore, enhance firm value (Jo and Kim 2007, 2008).

Furthermore, the effective external monitoring mechanisms, together with CSR engagement, will lead to better firm performance and value through reduced agency costs and reduced conflict of interests among various stakeholders. Because of external pressures from CSR engagement, institutional investors and analysts following are necessary to motivate managers to maximize firm value instead of pursuing managerial objectives (Aguilera et al. 2007; Jensen and Meckling 1976). Institutional investors are more willing and able to monitor corporate management than are smaller and more diffuse investors. Also, Chung and Jo (1996) indicate that security analysts play important roles as corporate monitors in reducing agency costs and motivating managers. Thus, institutional investors and analysts following have strong incentive to monitor managers (Demsetz and Lehn 1985; Shleifer and Vishny 1986). Thus, to the extent that institutional investors and security analysts provide effective external monitoring regarding the information transparency of CSR engagement, the CSR activities will have positive effects on firm value.

Role of Inside Debt

Jensen and Meckling (1976) indicate that there is a conflict of interest between shareholders and debtholders. This conflict arises because shareholders and managers can expropriate wealth from debtholders in several ways such as claim dilution, underinvestment, and asset substitution or risk

shifting. According to agency theory, inside debt in CEO compensation contracts can align interests of shareholders and debtholders. The argument is that the presence of inside debt potentially acts as a check on managers' incentives to take actions that transfer wealth from debtholders to shareholders, thereby lowering the cost of debt capital to the firm (Edmans and Liu 2010; Jensen and Meckling 1976).

In 2006, the Securities Exchange Commission (SEC) mandates detailed disclosure of executive compensation structure to include pension and deferred compensation holdings at the public. According to Wei and Yermack (2011), managers who hold large portions of pension and deferred compensation holdings takes the similar default risk that is faced by a company's other unsecured creditors. In other words, if the firm becomes bankrupt, the manager's pension and deferred compensation receive the same recovery rates as the debts of other unsecured lenders. In practice, Federal Pension Benefit Guaranty Corporation (PBGC) insure only a minor amount of a CEO's pension and executive pension plans are funded and secured only up to modest limits. Therefore, executives who are due lifetime pension benefits stand in line and should negotiate alongside other unsecured creditors when the firms are having serious financial troubles.

Due to incentive benefits from CEO relative leverage, many empirical studies in recent years have been focused the impacts of managerial inside debt on riskiness of firm investments. For instance, Sundaram and Yermack (2007) document that the firm's default risk decreases with the level of inside debt, consistent with higher inside debt leading managers to take on lower risk. Also, they found that managers who hold large CEO relative leverage tend to reduce risks from increasing portfolio diversification and asset liquidity. Wei and Yermack (2011) examine the disclosure of CEO-firm relative debt-to-equity ratio, following the SEC regulation in 2006, led to bond prices rising significantly and stock prices falling. Cassell et al. (2012) documents that CEO relative leverage is negatively associated with future stock returns, R&D expenditures, and financial leverage, which are widely used as proxies for risk-taking activities. Similarly, Anantharaman, Fang, and Gong (2013) find that firms whose CEOs have higher inside debt holdings have lower borrowing rates and fewer debt covenants. Furthermore, large portion of CEO relative leverage promotes high financial reporting quality (He 2015). As can be seen above, inside debt exposes the CEO to bankruptcy risk just as if the CEO held a piece of the firm's risky unsecured debt. Thus, inside debt motivates managerial incentives toward bondholders and balance the conflicts interests of stockholders and bondholders.

CSR and Compensation

Prior research on CSR and executive compensation has considered whether separate

components of executive compensation are associated with CSR. For instance, opportunistic executives prefer compensation contracts that minimize firm specific risk and maximize their self-interest at the expense of society and other stakeholders (Jensen and Meckling 1976). Also, using 90 Canadian firms, Mahoney and Thorne (2005) find that total CSR is positively related to higher levels of longer term compensation and CSR weakness is negatively related to higher long-term compensation. This in turn suggests that executive long-term compensation can be an effective tool in aligning executives' welfare with that of the "common good", which results in more socially responsible firms.

Recently, empirical literatures investigate how firms' CSR engagement affects CEO compensation. Cai, Jo, and Pan (2011) indicate that the new CSR-compensation causation can shed additional light on the issue of how socially responsible firms determine differently their executive compensation compare to that of socially irresponsible firms. As a result, they found that CSR engagement is negatively associated with executive's cash and total compensation, which is consistent with the conflict-resolution hypothesis based on stakeholder theory. According to Cai, Jo, and Pan (2011), CEOs of socially responsible firms will take relatively lower pay than those of socially irresponsible firms in following reasons: First, executive's excessive compensation may result potential conflicts of interests among managers and other stakeholders due to the fairness concern of a wealth distribution issue. Second, CEO with high social and ethical standards desire a more modest pay because top management in socially responsible firms should consider firms' fiduciary and moral responsibilities toward stakeholders (Aguilera et al. 2007; Jensen 2002; Potts 2006). Third, socially responsible firms generally face a lower level of firm risk (such as labor strikes and managerial turnover) due to a smaller degree of conflict of interest between top management and stakeholders than socially irresponsible firms, resulting in a lower CEO compensation.

Although Cai, Jo, and Pan (2011) find that CSR adversely affects total compensation, the definition of total compensation is quite complicated and vague since it consists of summation from all different types of compensations such as salary, bonus, the total value of restricted stock granted that year, and long-term incentive payouts. To extend Cai, Jo, and Pan (2011), we are focusing on the CEO's relative leverage, which is constructed as the CEO's debt-to-equity ratio scaled by the firm's debt-to equity ratio. Supporting conflict-resolution hypothesis, we believe that firms that are socially responsible pay out higher inside debt for CEOs compared to firms that are not. In summary, we expect the following:

H1: Firms that are socially responsible tend to have higher CEO relative leverage than those that are not after controlling for confounding factors.

Following Cai, Jo, and Pan (2011), the executive's compensation is directly associated with employee relations since huge gap between employee's own pay and executive compensation may increase their jobs' dissatisfactions (Potts 2006). Card et al. (2012) empirically show the effect of disclosing information on peers' salaries on workers' job satisfaction and job search intentions. The results represent an asymmetric response to the information about peer salaries: workers with salaries below the median, particularly for those in the lowest pay quartile, for their pay unit and occupation report lower pay and job satisfaction, while those earning above the median report no higher satisfaction. Also, below-median earners report a significant increase job turnover frequency, while above-median earners are unaffected. Thus, job satisfaction depends on relative pay comparisons, and this relationship is nonlinear. The findings indicate that employers have a strong incentive to impose pay secrecy rules and the disclosure of salary information results in a decline in job and pay satisfaction, concentrated among the lowest-earning workers. These literatures represent the positive relationship between compensation disparity and employee's job dissatisfactions.

Since employee satisfaction is significantly correlated with firm's profitability, innovation activities, and equity price, the huge compensation gap between executive and employee may bring firms to serious financial constraints. For instance, using sample of "100 Best Companies to Work For in America", Edmans (2011) show that firms are more aligned with employee relations benefit average 2.1% higher stock return, more positive earnings surprises and announcement returns, compare to firms that are not. Chang et al. (2015) find that non-executive employee stock options have positive effects on corporate innovation. This positive effect is more pronounced in firms where employees' input to innovation is more important and in firms where free-riding among employees is weaker. As shown above, resolving conflicts between executive and non-executive is critical for firm's future growth.

Under the conflict resolution hypothesis, better employee relations is the result of higher CEO's relative leverage. From firm's perspective, firms that are socially responsible pay out debt-like compensation to motivate CEOs to resolve conflicts from huge compensation disparity. From CEO's perspective, CEOs of socially responsible firms do not allow them to demand excessive compensation and to reduce potential conflict between employees and executives. Therefore, expect a positive association between employee relations and CEO's relative leverage under the conflict-resolution hypothesis.

H2: According to the conflict-resolution hypothesis, strong employee relations positively affect the CEO relative leverage.

3. Sample, Variables, and Descriptive Statistics

3.1 Sample Selection

We collect data CEO relative leverage data from Standard and Poor's ExecuComp database for the sample period. The ExecuComp database provides yearly data on executive compensation such as salary, bonus, stock options, restricted stock grants, and accumulated stock and option holdings for the top executives of firms in the Standard and Poor's (S&P) 500. It is the most widely used compensation database by accounting, economics, finance, and management scholars. Starting from August 29, 2006, the Securities and Exchange Commission (SEC) required public firms to disclose detailed information about the computation and value of executive pension benefits and deferred compensation. Thus, our sample period ranges from 2006 to 2008 since prior to 2006, firms were required to disclose annual pension benefits payable at retirement but not the present value of accumulated benefits.

We retrieve data on CSR scores from the Kinder, Lydenberg, and Domoni (KLD) database, which is the most comprehensive and widely used data for CSR research (Jo and Harjoto 2011; Mattingly and Berman 2006), for the sample period. The KLD has exclusionary screens relating to social ratings from involvement with alcohol, gambling, nuclear power, tobacco and the military. Since exclusionary screens only have negative social ratings, we only employ the inclusive screens relating to social ratings, which covers social rating criteria approximately 80 strength and concern ratings in seven major qualitative issue areas. We report a list of strength and items of concern in the KLD social ratings in Appendix A.

We merge CEO relative leverage data with KLD ratings in the previous fiscal year, and firm-specific accounting variables are obtained from Compustat, and CRSP. We exclude firms in the financial service industries in which liquidity is hard to assess (Standard Industrial Classification (SIC) codes 6000–6999) and in the utility sector due to their special regulatory status (SIC codes 4900–4999). We require our sample firm-years to have non-missing ExecuComp, Compustat and CRSP data to compute the variables used in our analyses. Finally, this matching procedure produces a total of 1,038 firm-year observations for testing the impact of firm's CSR activities on the ratio of CEO relative leverage.

3.2 Variable Measurement

Measurement of Relative Leverage

Following prior literatures, we measure managerial incentives linked to inside debt via the CEO's personal debt-to-equity ratio (inside leverage) relative to the firm's debt-to-equity ratio (firm leverage) (Edmans and Liu 2010; Jensen and Meckling 1976; Sundaram and Yermack 2007). If the

ratio is larger than one, CEO incentives are more aligned with debt holders than with equity holders and CEO will display lower levels of risk seeking behaviors. (Cassell et al. 2012).

The CEO personal leverage is defined as the value of inside debt holdings divided by the value of CEO equity holdings. The CEO's inside debt holding is the sum of the actuarial present value of accumulated benefits under defined-benefit pension plans and the total balance in the deferred compensation plans by the fiscal year-end. The CEO's equity holding includes the sum of the value of CEO equity holdings (including restricted stock) and the Black–Scholes value of stock options (Black and Scholes 1973). The firm leverage is calculated as the sum of long-term debt and debt in current liabilities divided by market value of stockholder equity at the fiscal year end.

CSR Measures

We include five qualitative issues such as Community Relations, Employee Relations, Environmental Issues, Product Quality, and Workplace Diversity. We exclude the Human Rights category in our CSR index because ratings in the human rights area were assigned mostly from Non-U.S. Operations category. We also exclude the Corporate Governance scores from the KLD since it may yield a different result to the GIM index used by Gompers, Ishii, and Metrick (2003). Following Cui, Jo, and Na (2016), we assign the value range from -1 to +1 and set zero, if not yet rated to construct net strength and net concern. Our CSR index is constructed by the sum of net strength and net concern The Net *CSR* of each category for firm-year observation is

$$Net\ CSR = \sum_s C_{ist} - \sum_c C_{ict}$$

Where C_{ist} represents an indicator variable of CSR for firm i with strength s for year t ; C_{ict} represents an indicator variable of CSR for firm i with concern c for year t .

Control variables

Control variables include CEO characteristics, other compensations and corporate governance. Following Sundaram and Yermack (2007), we control for CEO age and tenure since CEOs who have longer work experience in the firm are positively associated with the amount of pension benefits. To control CEO's risk-taking incentives, CEO salary and bonus (Anantharaman, Fang, and Gong 2013; Duru, Mansi, and Reeb 2005) are included. Also, we use CEO portfolio delta, which measures the change in CEO wealth for a 1% change in stock and CEO option vega, which represents 0.01 change in stock return volatility (Anantharaman, Fang, and Gong 2013; Cassell et al. 2012; Gormley, Matsa, and Milbourn 2013). In addition, we control for firm characteristics; growth opportunities measured with the market-to-book ratio, firm size measured by the natural log of total assets (SIZE), asset tangibility (TANGI), which is calculated as $(0.715 \times \text{Receivables} + 0.547 \times$

Inventory + 0.535 × Property Plant and Equipment) + Cash)/Total Assets (Almeida and Campello 2007) and default risk measured with the Altman (2000) Z score. Finally, we use Fama-French 12- industry classification to control year and industry effects.

Empirical Results

Univariate Tests

Table 1 provides descriptive statistics for the variables used in our analyses. We report the means, median, standard deviations, CEO relative leverage compensation, and control variables including firm and CEO characteristics. Similar to Anantharaman, Fang, and Gong (2013) and Wei and Yermack (2011), we find that the distribution of CEO's relative leverage is right-skewed with mean (median) of 1.63 (0.42). Since pays of some CEOs in our sample are extraordinarily large, our CEO relative leverage has large positive skewness.

[Insert Table 1]

Table 2 Panel A compares the means of CEO relative leverage for the subsample of firms with active CSR, if firm's CSR score is bigger than 0 and those with inactive CSR, if firm's CSR score is equal or less than 0 to explore the potential impact of CSR on CEO relative leverage. Similar to Panel A, Panel B excludes sample if firm's CSR is equal to zero. CEO relative leverage is significantly higher for firms with active CSR in both Panel A and B.

[Insert Table 2]

Table 3 presents the pairwise correlation matrix for CSR measure, CEO relative leverage, and firm and CEO characteristics. We notice that most of firm and corporate governance characteristics, which have been verified to impact CEO relative leverage also have significant correlation coefficients with our CSR measures. Thus, we use a multivariate test to examine the incremental effect of CSR on CEO relative leverage.

[Insert Table 3]

Multivariate Tests

Considering industry and year fixed effects, we run the following regressions to examine the impact of CSR on CEO relative leverage:

$$\begin{aligned}
 &CEO\ relative\ leverage_{i,t} \\
 &= \beta_0 + \beta_1 CSR_{i,t-1} + \beta_2 \ln(Tenure_{i,t} + 1) + \beta_3 \ln(Salary_{i,t} + 1) + \beta_4 \ln(Bonus_{i,t} + 1) \\
 &+ \beta_5 Vega_{i,t} + \beta_6 Delta_{i,t} + \beta_7 Size_{i,t-1} + \beta_8 ROA_{i,t-1} + \beta_9 Leverage_{i,t-1} + \beta_{10} BM\ ratio_{i,t-1} \\
 &+ \beta_{11} Tangibility_{i,t-1} + \beta_{12} AltmanZ_score_{i,t-1} + Year\ dummies + Industry\ dummies + \varepsilon_{it}
 \end{aligned}$$

Except CEO characteristics, we apply all lagged control variables including firm and corporate governance characteristics in the regression model to rule out potential reverse causality issue between CEO relative leverage and CSR (Anantharaman, Fang, and Gong 2013).

Our results are summarized in Table 4. In contrast to Cai, Jo, and Pan (2011), we find that on average, CEO relative leverage is higher for larger firms. Also, CEO relative leverage is higher when firms lead to less risky investment choice, as measured by delta (Gormley, Matsa, and Milbourn 2013) and tends to be lower default risk, as measured by AltmanZ score. Controlling for these firm, CEO and governance characteristics, our result presents that CSR index variable always has a positive and statistically significant coefficient, suggesting that CEO relative leverage is on average higher in socially responsible firms. Thus, consistent with the conflict–resolution hypothesis, our result supports hypothesis 1.

[Insert Table 4]

Instrumental Variable Approach (CSR Index)

Previous studies on CSR (Cui, Jo, and Na 2016; Jo and Harjoto 2011, 2012) indicate that CSR engagement is an endogenous variable. To address endogeneity concerns, we use the two-stage least squares method (2SLS) to alleviate the concern about omitted variables. Our instrumental variables (IV) are lagged CSR_index_industry-median (CSR_IDX). In our sample, our unreported results suggest that the correlation coefficient between firm-level Net CSR and its industry-median value is statistically significant while there is no statistically significant correlation between CSR_IDX, which confirms the validity of the three variables as IV. In the first stage, we regress CSR_IDX based on Fama and French (1993) 12industry classification in that year as an instrument. In the second stage, we use the predicted values estimated from the first stage and run regressions. We employ a two-stage least squares analysis (2SLS) as follows;

1st Stage: $CSR_{i,t-1}$

$$= \beta_0 + \beta_1 CSR_index_industry\ median_{i,t-1} + \beta_2 \ln(Tenure_{i,t} + 1) + \beta_3 \ln(Salary_{i,t} + 1) \\ + \beta_4 \ln(Bonus_{i,t} + 1) + \beta_5 Vega_{i,t} + \beta_6 Delta_{i,t} + \beta_7 Size_{i,t-1} + \beta_8 ROA_{i,t-1} + \beta_9 Leverage_{i,t-1} \\ + \beta_{10} BM\ ratio_{i,t-1} + \beta_{11} Tangibility_{i,t-1} + \beta_{12} AltmanZ_score_{i,t-1} + Year\ dummies \\ + Industry\ dummies + \eta_{it}$$

2nd Stage: CEO relative leverage_{i,t}

$$= \beta_0 + \beta_1 \widehat{CSR}_{i,t-1} + \beta_2 \ln(Tenure_{i,t} + 1) + \beta_3 \ln(Salary_{i,t} + 1) + \beta_4 \ln(Bonus_{i,t} + 1) \\ + \beta_5 Vega_{i,t} + \beta_6 Delta_{i,t} + \beta_7 Size_{i,t-1} + \beta_8 ROA_{i,t-1} + \beta_9 Leverage_{i,t-1} + \beta_{10} BM\ ratio_{i,t-1} \\ + \beta_{11} Tangibility_{i,t-1} + \beta_{12} AltmanZ_score_{i,t-1} + Year\ dummies + Industry\ dummies + \varepsilon_{it}$$

Table 5 presents our results from 2SLS IV estimations of CEO relative leverage. We report both first-stage and second-stage results. The first two columns present results with Net CSR

without industry dummies, and the last two columns include both year and industry effects. As reported in Column 1 and 3 Table 5, CSR_IDX is highly statistically significant at the 1%, even after controlling for all other firm and corporate governance characteristics. Even after mitigating endogeneity concerns, column 2 and 4 show that the impact of CSR on CEO relative leverage still remains positive and statistically significant at the 5% level.

[Insert Table 5]

CSR Employee relations

Our second hypothesis predicts positive association between employee relations and CEO relative leverage according to the conflict resolution hypothesis. Using CSR subcategory, Employee relations, we run the following regressions to examine the impact of CSR Employee relations on CEO relative leverage:

$$\begin{aligned}
 & \text{CEO relative leverage}_{i,t} \\
 &= \beta_0 + \beta_1 \text{CSR_Employee}_{i,t-1} + \beta_2 \ln(\text{Tenure}_{i,t} + 1) + \beta_3 \ln(\text{Salary}_{i,t} + 1) + \beta_4 \ln(\text{Bonus}_{i,t} + 1) \\
 &+ \beta_5 \text{Vega}_{i,t} + \beta_6 \text{Delta}_{i,t} + \beta_7 \text{Size}_{i,t-1} + \beta_8 \text{ROA}_{i,t-1} + \beta_9 \text{Leverage}_{i,t-1} + \beta_{10} \text{BM ratio}_{i,t-1} \\
 &+ \beta_{11} \text{Tangibility}_{i,t-1} + \beta_{12} \text{AltmanZ_score}_{i,t-1} + \text{Year dummies} + \text{Industry dummies} + \varepsilon_{it}
 \end{aligned}$$

In table 6, the Employee relations variable has a positive coefficient of 0.352, statistically significant at the 5% level. Firms that are aligned with Employee relations pay out debt-like compensation to motivate CEOs and employee themselves to resolve conflicts between each other. Our results are consistent with this argument, and support the conflict–resolution hypothesis.

[Insert Table 6]

Instrumental Variable Approach (Employee)

Our conclusion with industry-median Employee relations is similar to Table 5. We employ a two-stage least squares analysis (2SLS) as follows;

$$\begin{aligned}
 & \text{1st Stage : CSR_Employee}_{i,t-1} \\
 &= \beta_0 + \beta_1 \text{CSR_index_Employee_industry median}_{i,t-1} + \beta_2 \ln(\text{Tenure}_{i,t} + 1) \\
 &+ \beta_3 \ln(\text{Salary}_{i,t} + 1) + \beta_4 \ln(\text{Bonus}_{i,t} + 1) + \beta_5 \text{Vega}_{i,t} + \beta_6 \text{Delta}_{i,t} + \beta_7 \text{Size}_{i,t-1} + \beta_8 \text{ROA}_{i,t-1} \\
 &+ \beta_9 \text{Leverage}_{i,t-1} + \beta_{10} \text{BM ratio}_{i,t-1} + \beta_{11} \text{Tangibility}_{i,t-1} + \beta_{12} \text{AltmanZ_score}_{i,t-1} \\
 &+ \text{Year dummies} + \text{Industry dummies} + \eta_{it}
 \end{aligned}$$

$$\begin{aligned}
 & \text{2nd Stage: CEO relative leverage}_{i,t} \\
 &= \beta_0 + \beta_1 \text{CSR_Employee}_{i,t-1} + \beta_2 \ln(\text{Tenure}_{i,t} + 1) + \beta_3 \ln(\text{Salary}_{i,t} + 1) + \beta_4 \ln(\text{Bonus}_{i,t} + 1) \\
 &+ \beta_5 \text{Vega}_{i,t} + \beta_6 \text{Delta}_{i,t} + \beta_7 \text{Size}_{i,t-1} + \beta_8 \text{ROA}_{i,t-1} + \beta_9 \text{Leverage}_{i,t-1} + \beta_{10} \text{BM ratio}_{i,t-1} \\
 &+ \beta_{11} \text{Tangibility}_{i,t-1} + \beta_{12} \text{AltmanZ_score}_{i,t-1} + \text{Year dummies} + \text{Industry dummies} + \varepsilon_{it}
 \end{aligned}$$

Column 1 Table 7 shows that the industry-median Employee relations has a coefficient of 8.57 that is statistically significant at the 1% level and the associated t-stat is 6.908. Consistent with table 5, column 2 and 4 in table7 show that the impact of CSR on CEO relative leverage remains

positive and statistically significant at the 5% level after mitigating endogeneity concerns.

[Insert Table 7]

Robustness tests

Alternative measurement of CSR

We use alternative proxy for measuring CSR, CSR indicator, to support our hypothesis that the positive relation between CSR and CEO relative leverage. CSR indicator is a dummy variable which equals to one if a firm has engaged in CSR activities, and zero otherwise. As a result, column 8 of Table 8 presents the CSR dummy is significantly and positively associated with CEO relative leverage after controlling year and industry effects. The results from table 8 remain qualitatively similar to our previous findings.

[Insert Table 8]

Propensity score matching (PSM)

In order to examine the different treatment effect of CSR on CEO relative leverage in U.S. firms, we calculate propensity score based CSR index_industry median. We separate our sample by propensity score that has value from 0 to 1, and we matched the most similar observation in same year and same industry. After matching by propensity score, we analyze the difference between treatment group and control group on the effect of CSR on CEO relative leverage, and check the significance level by using t-statistics. As a result, Panel A show the results of logit regression by each dummy variables, and the coefficient of CSR index_industry median We predict propensity score from the logit regression, and matched samples in 0.01 level. The result of Panel B presents that the differences are 0.726 and 1.10 in both dummies and significant at 5% level. It means that treatment group pay more CEO relative leverage than control group in the whole sample.

[Insert Table 9]

Conclusion & Discussion

Paying CEO with inside debt has increased sharply over the last decade. As a result, it has become one of the hottest topics of great interest for shareholders, government regulators, and academic researchers. Due to incentive benefits from CEO relative leverage, many empirical studies in recent years have been focused the impacts of managerial inside debt on riskiness of firm investments. However, there is a limited research on how socially responsible firms should influence to their executive compensation packages, in particular CEO relative leverage.

In this article, we investigate the empirical impact of firms' CSR engagement CEO relative leverage using a sample of the U.S. firms from 2006 to 2008. We find that lagged CSR is positively associated with CEO's relative leverage after controlling for various firm and corporate governance characteristics. Also, we find that the observed positive association between CSR and CEO relative leverage mostly comes from employee relations. Our results hold up well even when we control for potential endogeneity using the IV approach. This finding suggests firms that are more socially responsible increase CEO relative leverage to motivate CEOs to resolve conflicts between stakeholders, supporting the conflict-resolution hypothesis based on stakeholder theory. For the robustness tests, we employ CSR indicator, as an alternative proxy of the CSR, to investigate the robust positive relation between CSR and CEO relative leverage. Our findings remain consistent with the main results and still support the conflict-resolution hypothesis. Also, we conduct propensity score matching to examine the different treatment effect of CSR on CEO relative leverage in U.S. firms. We matched treatment and control groups by CSR dummy in same year and same industry and find that treatment group pay more CEO relative leverage, resulting higher CEO relative leverage, than control group.

The contributions of this research are as follows. First, most studies have focused on how managerial debt-like compensation influences the policy choices of firms such as R&D expenditures, firm leverage, and stock volatility (Cassell et al. 2012). Therefore, our new CSR-compensation causation can shed additional light on the issue of how socially responsible firms determine their executive compensation differently from socially irresponsible firms. To the best of our knowledge, this is the first paper that has ever investigated a robust positive relation between lagged CSR and CEO relative leverage. Second, our findings emphasize that socially responsible firms put devotion by paying out CEO relative leverage. It is to reduce compensation disparity between executive and employee and to increase employees' job satisfactions. These findings also show that firms that are more aligned with employee relations cause stronger corporate performances through improved employee motivation, according to Edmans (2011). Finally, similar to Cai, Jo, and Pan (2011), we have made contribution to the literature on CSR's role that resolves conflicts among stakeholders. The positive relations between CEO relative leverage and lagged CSR support the conflict-resolution hypothesis. Overall, our results suggest that socially responsible firms are more prudent in determining their CEOs' compensation levels.

Table 1. Descriptive statistics

This table presents the descriptive statistics of sample. The sample consists of 1,038 U.S. non-financial firm-year observations over the 2006-2008 period.

Variables	N	Mean	Standard deviation	25% quantile	Median	75% quantile
CEO relative leverage	1038	1.627086	4.165465	.0275425	.4172234	1.31202
CSR	1038	-.3179191	2.527589	-2	0	0
CSR_Employee	1038	-.2418112	.9880215	-1	0	0
Tenure	1038	1.668683	.8509398	1.098612	1.609438	2.197225
Salary	1038	6.715118	.3954501	6.457554	6.742915	6.979217
Bonus	1038	1.47237	2.696167	0	0	0
Vega	1038	.2531408	.3633745	.0391437	.1072224	.3029999
Delta	1038	.1239641	.2146169	.0270955	.0566942	.1187691
Size	1038	8.130005	1.529193	6.959031	7.97007	9.182661
ROA	1038	.0642779	.0638914	.0341839	.0600006	.0964836
Leverage	1038	.5546859	.1678111	.4441274	.5559285	.6713105
BM ratio	1038	.4267644	.2314116	.2558178	.3817621	.5597354
Tangibility	1038	.3173547	.2293581	.1350931	.2503292	.4885086
AltmanZ	1038	3.774322	2.133953	2.14201	3.891359	4.980743

Table 2. Univariate analysis of CEO relative leverage

This table presents the result of univariate analysis where the dependent variable is CEO relative leverage that measured by relative ratio of CEO leverage and firm leverage. T-test and Wilcoxon test are used, and t-statistics and z-statistics are reported in parentheses. The null value for CEO relative leverage is one rather than zero. ***, ** and * denote significance at the 1, 5 and 10% level, respectively.

Panel A: Pooled

CEO relative leverage	Total	Active CSR (CSR > 0)	Inactive CSR (CSR ≤ 0)	Difference
Mean	1.6271*** (4.850)	2.8369*** (4.574)	1.2392** (2.199)	1.5977*** (5.369)
Median	0.4172*** (-6.612)	0.6850 (0.273)	0.3533*** (-7.906)	0.3317*** (3.387)
Observations	1038	252	786	

Panel B: Excluding sample with CSR=0

CEO relative leverage	Total	Active CSR (CSR > 0)	Inactive CSR (CSR < 0)	Difference
Mean	1.7787*** (4.691)	2.8369*** (4.574)	1.1990 (1.5894)	1.6379*** (4.791)
Median	0.4783*** (-4.404)	0.6850 (0.273)	0.3988*** (-5.863)	0.2862*** (2.630)
Observations	712	252	460	

Table 3. Correlation matrix

This table presents pairwise correlation coefficients between the regression variables. The sample consists of 1,038 U.S. non-financial firm-year observations over the 2006-2008 period. t-statistics are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10% level, respectively.

Variables	CEO relative leverage	CSR	CSR_Employee	Tenure	Salary	Bonus	Vega	Delta	Size	ROA	Leverage	BM ratio	Tangibility	AltmanZ
CEO relative leverage	1.0000													
CSR	0.1347*** (0.0000)	1.0000												
CSR_Employee	0.1228*** (0.0001)	0.5415*** (0.0000)	1.0000											
Tenure	-0.0812*** (0.0089)	-0.0276 (0.3741)	0.0328 (0.2915)	1.0000										
Salary	0.1103*** (0.0004)	0.0742* (0.0167)	0.0145 (0.6410)	0.1177*** (0.0001)	1.0000									
Bonus	-0.0538* (0.0829)	-0.0613** (0.0482)	0.0297 (0.3399)	0.0115 (0.7102)	-0.0418 (0.1788)	1.0000								
Vega	0.1494*** (0.0000)	0.2194*** (0.0000)	0.1144*** (0.0002)	0.1515*** (0.0000)	0.5188*** (0.0000)	-0.0164 (0.5972)	1.0000							
Delta	-0.1051*** (0.0007)	0.0510 (0.1003)	0.0556* (0.0736)	0.2692*** (0.0000)	-0.0350 (0.2604)	0.0511 (0.1002)	0.1269*** (0.0000)	1.0000						
Size	0.1359*** (0.0000)	0.0374 (0.2282)	0.0624** (0.0444)	-0.0602* (0.0527)	0.7337*** (0.0000)	-0.0114 (0.7144)	0.5394*** (0.0000)	0.0306 (0.3252)	1.0000					
ROA	0.1376*** (0.0000)	0.1587*** (0.0000)	0.1169*** (0.0002)	0.0543* (0.0802)	0.1037*** (0.0008)	-0.0255 (0.4115)	0.1848*** (0.0000)	0.1096*** (0.0004)	0.0755** (0.0150)	1.0000				
Leverage	-0.0959*** (0.0020)	-0.1297*** (0.0000)	-0.0854*** (0.0059)	-0.0261 (0.4014)	0.2613*** (0.0000)	-0.0110 (0.7244)	0.0202 (0.5154)	-0.0511 (0.1001)	0.3587*** (0.0000)	-0.3147*** (0.0000)	1.0000			
BM ratio	-0.0989*** (0.0014)	-0.2067*** (0.0000)	-0.1014*** (0.0011)	-0.0335 (0.2807)	-0.1758*** (0.0000)	0.0361 (0.2458)	-0.2515*** (0.0000)	-0.1544*** (0.0000)	-0.1014*** (0.0011)	-0.4023*** (0.0000)	-0.1016*** (0.0011)	1.0000		
Tangibility	-0.0719** (0.0205)	-0.2612*** (0.0000)	-0.0933*** (0.0026)	0.0889*** (0.0042)	0.0377 (0.2247)	0.1223*** (0.0001)	-0.0669** (0.0310)	0.0158 (0.6122)	0.2305*** (0.0000)	-0.0107 (0.7299)	0.2343*** (0.0000)	0.0856*** (0.0058)	1.0000	
AltmanZ	0.1944*** (0.0000)	0.1556*** (0.0000)	0.1025*** (0.0009)	-0.0265 (0.3935)	-0.1260*** (0.0000)	0.0032 (0.9176)	0.0097 (0.7557)	0.0273 (0.3797)	-0.2913*** (0.0000)	0.4340*** (0.0000)	-0.6929*** (0.0000)	-0.1601*** (0.0000)	-0.3694*** (0.0000)	1.0000

Table 4. The effect of CSR: OLS estimation

This table presents the result from cross-sectional OLS regressions where the dependent variables are CEO relative leverage. t-statistics are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10% level, respectively.

Variables	(1) CEO relative leverage	(2) CEO relative leverage	(3) CEO relative leverage	(4) CEO relative leverage	(5) CEO relative leverage	(6) CEO relative leverage	(7) CEO relative leverage	(8) CEO relative leverage
CSR	0.2238*** (3.036)	0.1735*** (2.775)	0.1406** (2.236)	0.1322** (2.217)	0.2337*** (3.207)	0.1944*** (3.018)	0.1561** (2.512)	0.1507** (2.526)
Tenure		-0.3660*** (-2.652)		-0.1294 (-1.138)		-0.3729*** (-2.619)		-0.1370 (-1.199)
Salary		0.4157 (1.088)		-0.6457 (-1.357)		0.3623 (0.892)		-0.6168 (-1.323)
Bonus		-0.0578 (-1.388)		-0.0667 (-1.581)		-0.0702* (-1.685)		-0.0630 (-1.514)
Vega		1.4836*** (2.616)		0.5712 (0.951)		1.3978** (2.464)		0.5698 (0.901)
Delta		-2.0055*** (-6.806)		-2.5303*** (-7.228)		-1.9700*** (-6.255)		-2.4903*** (-6.816)
Size			0.5462*** (4.427)	0.5911*** (3.150)			0.5037*** (4.203)	0.5437*** (2.692)
ROA			0.0691 (0.028)	0.4023 (0.169)			0.5479 (0.210)	0.6798 (0.270)
Leverage			0.1443 (0.172)	0.0152 (0.016)			0.0815 (0.088)	0.1575 (0.161)
BM ratio			-0.4138 (-0.797)	-0.7136 (-1.272)			-0.4438 (-0.808)	-0.6818 (-1.222)
Tangibility			-0.1571 (-0.290)	0.0484 (0.080)			-0.4121 (-0.590)	-0.3567 (-0.504)
AltmanZ			0.4655*** (4.716)	0.4588*** (4.551)			0.4780*** (4.114)	0.4776*** (4.041)
Constant	1.8268*** (7.638)	-0.4265 (-0.172)	-4.1605*** (-4.111)	0.4534 (0.174)	1.8127*** (7.692)	-0.0241 (-0.009)	-3.7893*** (-2.816)	0.5639 (0.217)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	No	No	No	Yes	Yes	Yes	Yes
Observations	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038
Adj. R-squared	0.0161	0.0501	0.0805	0.0981	0.0224	0.0529	0.0819	0.0983

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Table 5. The effect of CSR: 2SLS estimation

This table presents the result from two-stage-least-square regressions where the dependent variables are CEO relative leverage. We use the instrument variable as industry median value of CSR index. t-statistics are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10% level, respectively.

Variables	(1) 1st stage: CSR	(2) 2nd stage : CEO relative leverage	(3) 1st stage: CSR	(4) 2nd stage : CEO relative leverage
CSR		0.3986** (2.322)		0.4176** (2.268)
CSR index_industry median	39.1301*** (9.671)		37.4577*** (8.760)	
Tenure	-0.1467* (-1.788)	-0.0926 (-0.786)	-0.0933 (-1.155)	-0.1149 (-0.989)
Salary	-0.1497 (-0.536)	-0.6138 (-1.302)	-0.3186 (-1.104)	-0.5489 (-1.191)
Bonus	-0.0189 (-0.637)	-0.0605 (-1.451)	0.0006 (0.019)	-0.0627 (-1.513)
Vega	1.1523*** (3.183)	0.2552 (0.404)	0.8811** (2.452)	0.3313 (0.504)
Delta	0.1536 (0.429)	-2.5761*** (-7.299)	0.0864 (0.244)	-2.5192*** (-6.800)
Size	0.0383 (0.354)	0.5852*** (3.130)	0.1428 (1.305)	0.5129** (2.523)
ROA	1.9056 (1.227)	-0.1760 (-0.072)	2.9884** (1.963)	-0.1915 (-0.071)
Leverage	-1.4836** (-2.284)	0.4844 (0.482)	-1.0062 (-1.444)	0.4673 (0.464)
BM ratio	-1.4442*** (-3.960)	-0.2960 (-0.493)	-1.1637*** (-3.201)	-0.3398 (-0.586)
Tangibility	-2.4147*** (-6.312)	0.7105 (0.963)	-0.7563** (-2.014)	-0.1558 (-0.220)
AltmanZ	-0.0447 (-0.863)	0.4774*** (4.594)	-0.0165 (-0.290)	0.4848*** (4.052)
Constant	2.5622* (1.652)	-0.2737 (-0.105)	1.7504 (1.066)	0.1296 (0.051)
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	No	No	Yes	Yes
Observations		1,038		1,038
Adj. R-squared	0.176	0.0950	0.208	0.0938
Spearman's Rho		0.0851***		0.0440

Table 6. The effect of CSR_Employee: OLS estimation

This table presents the result from cross-sectional OLS regressions where the dependent variables are CEO relative leverage. t-statistics are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10% level, respectively.

Variables	(1) CEO relative leverage	(2) CEO relative leverage	(3) CEO relative leverage	(4) CEO relative leverage	(5) CEO relative leverage	(6) CEO relative leverage	(7) CEO relative leverage	(8) CEO relative leverage
CSR_Employee	0.5195*** (3.090)	0.4911*** (3.160)	0.3426** (2.411)	0.3575** (2.551)	0.5107*** (3.105)	0.4902*** (3.149)	0.3459** (2.432)	0.3622** (2.573)
Tenure		-0.4079*** (-2.888)		-0.1727 (-1.486)		-0.4097*** (-2.843)		-0.1717 (-1.484)
Salary		0.4291 (1.129)		-0.5237 (-1.111)		0.3824 (0.951)		-0.5629 (-1.210)
Bonus		-0.0723* (-1.735)		-0.0751* (-1.777)		-0.0791* (-1.888)		-0.0688* (-1.652)
Vega		1.6039*** (2.691)		0.6870 (1.118)		1.5082** (2.567)		0.6664 (1.038)
Delta		-1.9935*** (-6.874)		-2.5088*** (-7.263)		-1.9521*** (-6.233)		-2.4816*** (-6.781)
Size			0.5483*** (4.383)	0.5470*** (2.987)			0.5137*** (4.199)	0.5242*** (2.617)
ROA			0.1274 (0.052)	0.4313 (0.182)			0.8155 (0.313)	0.8886 (0.355)
Leverage			-0.0015 (-0.002)	-0.0777 (-0.083)			-0.0473 (-0.050)	0.0712 (0.072)
BM ratio			-0.5813 (-1.118)	-0.8144 (-1.455)			-0.5946 (-1.087)	-0.7946 (-1.433)
Tangibility			-0.4297 (-0.815)	-0.1098 (-0.185)			-0.4597 (-0.661)	-0.3711 (-0.526)
AltmanZ			0.4530*** (4.681)	0.4454*** (4.514)			0.4642*** (4.069)	0.4639*** (3.997)
Constant	1.8613*** (7.462)	-0.4094 (-0.166)	-3.8638*** (-4.032)	0.2711 (0.104)	1.8477*** (7.472)	-0.0718 (-0.028)	-3.6569*** (-2.748)	0.5695 (0.220)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	No	No	No	Yes	Yes	Yes	Yes
Observations	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038
Adj. R-squared	0.0128	0.0530	0.0805	0.0994	0.0188	0.0540	0.0807	0.0983

Table 7. The effect of CSR_Employee: 2SLS estimation

This table presents the result from two-stage-least-square regressions where the dependent variables are CEO relative leverage. We use the instrument variable as industry median value of CSR employee dimension index. t-statistics are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10% level, respectively.

Variables	(1) 1st stage: CSR_Employee	(2) 2nd stage : CEO relative leverage	(3) 1st stage: CSR_Employee	(4) 2nd stage : CEO relative leverage
CSR_Employee		1.1691*** (2.604)		1.2465** (2.421)
CSR index_Employee_industry median	9.0637*** (7.528)		8.5696*** (6.908)	
Tenure	0.0410 (1.142)	-0.2296** (-2.007)	0.0350 (0.957)	-0.2260** (-1.986)
Salary	-0.3744*** (-3.180)	-0.2108 (-0.430)	-0.2790** (-2.229)	-0.3377 (-0.722)
Bonus	0.0144 (1.121)	-0.0871** (-2.016)	0.0147 (1.130)	-0.0824* (-1.916)
Vega	0.1055 (0.762)	0.5935 (0.962)	0.0930 (0.640)	0.5738 (0.888)
Delta	0.0172 (0.115)	-2.5116*** (-7.285)	0.0194 (0.127)	-2.5002*** (-6.793)
Size	0.1249*** (3.022)	0.4405** (2.306)	0.1059** (2.357)	0.4344** (2.127)
ROA	0.6755 (1.262)	-0.1545 (-0.064)	0.7669 (1.393)	0.1971 (0.076)
Leverage	-0.3087 (-1.146)	0.2402 (0.247)	-0.1698 (-0.599)	0.2873 (0.288)
BM ratio	-0.2902** (-2.001)	-0.5724 (-1.011)	-0.2126 (-1.430)	-0.5988 (-1.085)
Tangibility	-0.4655*** (-3.108)	0.2771 (0.435)	-0.2747 (-1.563)	-0.1291 (-0.183)
AltmanZ	0.0126 (0.592)	0.4358*** (4.453)	0.0226 (0.982)	0.4403*** (3.846)
Constant	1.5155** (2.381)	-0.9623 (-0.361)	0.8313 (1.252)	-0.0154 (-0.006)
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	No	No	Yes	Yes
Observations		1,038		1,038
Adj. R-squared	0.111	0.0982	0.120	0.0970
Spearman's Rho		0.0015		-0.0035

Table 8. Robustness test: OLS estimation for CSR dummy

This table presents the result from cross-sectional OLS regressions where the dependent variables are CEO relative leverage. CSR dummy is equal to one if firm's CSR score is greater than zero, otherwise zero. t-statistics are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10% level, respectively.

Variables	(1) CEO relative leverage	(2) CEO relative leverage	(3) CEO relative leverage	(4) CEO relative leverage	(5) CEO relative leverage	(6) CEO relative leverage	(7) CEO relative leverage	(8) CEO relative leverage
CSR dummy	1.6195*** (3.858)	1.3180*** (3.605)	0.9857*** (2.866)	0.9584*** (2.841)	1.6575*** (4.096)	1.4272*** (3.903)	1.0349*** (3.076)	1.0295*** (3.082)
Tenure		-0.3577*** (-2.590)		-0.1407 (-1.222)		-0.3645** (-2.575)		-0.1487 (-1.293)
Salary		0.2800 (0.747)		-0.6552 (-1.382)		0.2306 (0.585)		-0.6328 (-1.363)
Bonus		-0.0483 (-1.173)		-0.0597 (-1.423)		-0.0601 (-1.450)		-0.0561 (-1.350)
Vega		1.4876** (2.516)		0.6413 (1.048)		1.4051** (2.408)		0.6430 (1.005)
Delta		-2.0687*** (-6.803)		-2.5448*** (-7.158)		-2.0431*** (-6.291)		-2.5112*** (-6.765)
Size			0.5106*** (4.284)	0.5467*** (3.032)			0.4721*** (4.067)	0.5032*** (2.582)
ROA			0.0696 (0.028)	0.4094 (0.172)			0.6042 (0.231)	0.7357 (0.292)
Leverage			0.1658 (0.188)	0.0782 (0.082)			0.0935 (0.098)	0.2000 (0.201)
BM ratio			-0.4285 (-0.832)	-0.7047 (-1.274)			-0.4467 (-0.815)	-0.6691 (-1.212)
Tangibility			-0.1629 (-0.317)	0.0644 (0.112)			-0.3709 (-0.531)	-0.3092 (-0.438)
AltmanZ			0.4569*** (4.689)	0.4504*** (4.510)			0.4635*** (4.033)	0.4632*** (3.955)
Constant	1.3865*** (6.908)	0.1067 (0.043)	-4.1153*** (-4.115)	0.5888 (0.226)	1.3625*** (6.760)	0.4506 (0.176)	-3.7886*** (-2.826)	0.7110 (0.275)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	No	No	No	Yes	Yes	Yes	Yes
Observations	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038
Adj. R-squared	0.0254	0.0569	0.0832	0.101	0.0317	0.0603	0.0840	0.101

Table 9. Robustness test: Propensity Score Matching (PSM)

This table presents the result from propensity score matching. Panel A reports the result of logit regression where dependent variable is CSR dummy that used in Table 8. We estimate CSR dummy by the industry median value of CSR index and firm characteristic control variables. z-statistics are reported in parentheses. Panel B reports the result of PSM where dependent variable is CEO relative leverage. First row in panel B reports the difference of treatment group and control group that matched by CSR dummy in same year. Second row in panel B reports the difference of treatment group and control group that matched by CSR dummy in same year and same industry which classified Fama-French 12-industry classification. Number of observations are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10% level, respectively.

Panel A: Logit regression

Variables	CSR dummy
CSR index_ industry median	69.8030*** (3.853)
Size	0.3688*** (6.492)
ROA	2.1250 (1.269)
Leverage	-1.9357*** (-2.736)
BM ratio	-1.8157*** (-3.892)
Tangibility	-2.6910*** (-6.093)
AltmanZ	-0.0121 (-0.212)
Constant	-1.6984** (-2.284)
Observations	1,038
Pseudo. R-squared	0.161

Panel B: Propensity score matching

	Treated	Controls	Difference	t-statistic
CSR dummy for same year	2.0441 (n=214)	1.3182 (n=661)	0.7259	1.965**
CSR dummy for same year and same industry	2.3804 (n=167)	1.2777 (n=363)	1.1027	2.079**

Appendix A. List of the strength and concern items in the KLD database

KLD inclusive social ratings

Category	Strength items	Concern items
Community	Generous giving	Investment controversies
	Innovative giving	Negative economic impact
	Support for Housing	Indigenous people relations (2000-2001)
	Support for education (added 1994)	Other concern
	Indigenous people relations (added '00, moved '02)	
	Non-U.S. charitable giving	
	Other strength	
Environment	Beneficial products & services	Hazardous waste
	Pollution prevention	Regulatory problems
	Recycling	Ozone depleting chemicals
	Alternative fuels	Substantial emissions
	Communications (added '96)	Agricultural chemicals
	Property, plant, and equipment(ended 1995)	Climate change (added 1999)
	Other strength	Other concern
Diversity	CEO	Controversies
	Promotion	Non-representation
	Board of Directors	Other concern
	Family benefits	
	Women/minority contracting	
	Employment of the disabled	
	Progressive gay & lesbian policies	
	Other strength	
Employee Relations	Strong union relations	Poor union relations
	No layoff policy (ended '94)	Health safety concern
	Cash profit sharing	Workforce reductions
	Employee involvement	Pension/benefits (added 1992)
	Strong retirement benefits	Other concern
	Health and safety strength (added 2003)	
	Other strength	

Product quality and safety	Quality	Product safety
	R&D/ innovation	Marketing/contracting controversy
	Benefits to economically disadvantaged	Antitrust
	Other strength	Other concern

Appendix B. The definition of variables

Variable name	Definition	Source
CEO relative leverage	The ratio of CEO's debt-to-equity ratio to the firm's leverage ratio: CEO to firm leverage = (CEO relative leverage / CEO equity holding value) / (Firm debt / Firm Equity). CEO relative leverage is the sum of present value of accumulated pension benefits and deferred compensation; CEO equity holding value is the sum of stock value and stock option value by Black and Scholes (1973) option formula; Firm debt is the sum of long-term debt and debt in current liabilities; Firm equity is the market value of equity.	Calculation based on Execucomp and Compustat
CSR Composite Index	CSR index calculated as $CSR_{idx} = \frac{\sum_s C_{is} - \sum_c C_{ic}}{C_s + C_c}$ where C_{is} is CSR strength, C_{ic} is CSR concerns, C_s is the maximum number of CSR strength in the industry, and C_c is the maximum number of CSR concerns in the industry.	KLD
Net CSR	Difference between the number of all strength items a firm has engaged in and the number of all concern items it has	KLD
CSR_Employee	Difference between the average STR_EMP and CON_EMP	KLD
Tenure	The natural logarithm of the sum of CEO's tenure and one.	Execucomp
Salary	The natural logarithm of the sum of CEO's salary (in thousands \$) and one.	Execucomp
Bonus	The natural logarithm of the sum of CEO's bonus (in thousands \$) and one.	Execucomp
Vega	The sensitivity of CEO's option value for a one-percent change in stock price volatility.	Calculation based on Execucomp
Delta	The sensitivity of CEO's option value for a one-percent change in stock price.	Calculation based on Execucomp
Size	The natural logarithm of firm's total assets (in millions \$).	Compustat
ROA	The ratio of firm's net income to total assets.	Compustat
Leverage	The ratio of firm's total liabilities to total assets.	Compustat
BM ratio	Book-to-Market ratio; the ratio of firm's total book value of equity to market value of equity.	Compustat
Tangibility	The ratio of firm's tangible assets to total assets; tangible assets are net property, plant, and equipment.	Compustat
AltmanZ	Altman's Z score, calculated by the method of Hillegeist et al. (2004) and Altman (2000).	Calculation based on Compustat
Industry dummies	Fama-French industry classification by twelve categories.	Compustat Fama and French (1993)

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