

Vice or Virtue? The Impact of Corporate Social Responsibility on Executive Compensation

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Abstract We empirically examine the impact of corporate social responsibility (CSR) on CEO compensation using a large sample of the US firms from 1996 to 2010. We develop and test two hypotheses, the overinvestment hypothesis based on agency theory and the conflict–resolution hypothesis based on stakeholder theory. We find that the lag of CSR adversely affects both total compensation and cash compensation, after controlling for various firm and board characteristics. Our estimates show that an interquartile increase in CSR is followed by a 4.35% (2.78%) decrease in total (cash) compensation. We also find an inverse association between lagged employee relations and CEO compensation. Our results are robust to the correction for endogeneity using instrumental variable approach. Taken together, our results support the conflict–resolution hypothesis, but not the CSR overinvestment argument.

Keywords Corporate social responsibility · Executive compensation · Conflict resolution

Introduction

An increasing number of firms worldwide are taking serious efforts to integrate corporate social responsibility (CSR) into various aspects of their businesses. CSR, however, remains a highly contentious subject and the debates about CSR continue to grow without a clear consensus on its meaning or value. Friedman (1970) first defines CSR as follows: “CSR is to conduct the business in accordance with shareholders’ desires, which generally will be to make as much money as possible while conforming to the basic rules of society, both those embodied in law and those embodied in ethical custom.” Carroll (1979, 1991, 1999), Gatewood and Carroll (1991), and Hill et al. (2007) propose four characteristics of CSR: economic, legal, ethical, and philanthropic that influence the quality of life of relevant stakeholders. Recently, Barnea and Rubin (2010) and Jo and Harjoto (2011a, b) suggest that while the definition of CSR varies, it generally refers to serving people, communities, and the environment in ways that go above and beyond what is legally required of a firm.

One particular question that has attracted much recent attention is the sharp increase in CEO compensation, especially compared to the average employee compensation.¹ The widening pay disparity has raised both ethical concerns and economic questions by commentators, investors, and regulators. Several prior studies examine the impact of executive compensation on firm’s CSR engagement. Mahoney and Thorn (2006), for instance, examine the impact of 1-year lagged executive compensation structure on total CSR engagement, CSR strength, and CSR

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¹ See e.g., Jensen and Murphy (1990), Florin et al. (2010), and Frydman and Jenter (2010).

concerns for a small sample of 77 Canadian firms. They find a significantly positive relation between CEO salary and CSR weaknesses, between CEO bonus and CSR strengths, and between CEO stock options and total CSR as well as CSR strength. Their results suggest that the structure of executive compensation could be used as an effective tool to encourage managers to undertake socially responsible actions, therefore resulting in more socially responsible firms.

In this article, we ask whether firms that are more socially responsible pay their CEOs less.² In particular, we empirically investigate how the US firms' CSR engagement affects CEO compensation, an issue that has been largely overlooked in the literature. This new CSR-compensation causation sheds additional light on the issue of how socially responsible firms behave differently from socially irresponsible firms in determining their executive compensation. Furthermore, the causal effect of CSR on executive compensation provides an interesting laboratory to test two hypotheses about CSR, an overinvestment hypothesis based on Jensen and Meckling's (1976) agency theory and a conflict-resolution explanation based on stakeholder theory (e.g., Freeman 1984; Wood 1991; Donaldson and Preston 1995, among others).

While the literature on agency theory typically emphasizes shareholder wealth maximization, stakeholder theory requires managers to serve other stakeholders as well (Ricart et al. 2005; Spitzack 2009). Freeman (1984) argues that because a firm has relations with a broad variety of stakeholders, including employees, competitors, consumers, environmental advocates, media, governments, and others, executives should be considered as spokesmen for broader participants in social and political processes and as builders of coalitions among external stakeholders. Wood (1991) explains that, at the individual level, managers are obliged to exercise discretion toward socially responsible outcomes within every domain of CSR. Hence, given the growing importance of stakeholder theory in CSR literature, it is particularly acute to determine the relative importance of agency and stakeholder theories regarding the causal impact of CSR on executive compensation.

Based on Jensen and Meckling's (1976) agency theory, Barnea and Rubin (2010) propose the overinvestment hypothesis, which suggests that if CSR initiatives do not maximize firm value, such initiatives are a waste of valuable resources and a potentially value-destroying proposition. They further argue that insiders tend to overinvest in

CSR for their private benefit as it improves their own reputations as being good citizens. To the extent that a good reputation increases a CEO's outside career opportunity and therefore his/her bargaining power, the overinvestment explanation predicts a positive association between CSR engagement and CEO compensation (Milbourn 2003).

On the other hand, firms could use CSR to resolve the conflicts between managers, shareholders, and other non-investing stakeholders (Freeman 1984). Donaldson and Preston (1995) argue that firm value depends on the interests of all stakeholders, and firms that practice stakeholder management will, other things being equal, outperform others that do not. Because CSR activities involve areas such as employee relations, community, environment, and diversity of the workforce, it has received increasing attention for its potential role in resolving conflicts among stakeholders (e.g., Jensen 2002; Calton and Payne 2003; Scherer et al. 2006; Cespa and Cestone 2007; Harjoto and Jo 2011; Jo and Harjoto 2011a, b). Under this conflict-resolution hypothesis, we expect the relation between CSR and CEO compensation to be negative for the following reasons. First, CEOs of socially responsible firms will take relatively lower pay than those of socially irresponsible firms to mitigate potential conflicts of interests among managers and other stakeholders such as employees, NGOs, social activists, and government, and/or to improve the fairness concern of a wealth distribution issue.³ Second, regardless of the fairness of the recent debate over excessive executive compensation, virtue ethics would suggest that a more modest pay is desirable for a CEO with high social and ethical standards (Potts 2006). Third, firms that actively undertake CSR activities will also face a lower level of firm risk due to a smaller degree of conflict of interest between top management and stakeholders than socially irresponsible firms, resulting in lower CEO pay.

³ Top management of socially responsible firms will also refrain or reduce controversial pay practices, such as generous severance pay, sign-on bonuses, unusual retirement packages, golden parachutes in case of a change of control, paying gross-ups for taxes executives owe on their compensation, option repricing, option backdating, and so on. O'Brien (2010) criticizes that extreme imbalance of the US CEO pay can undermine corporate culture, especially values like trust, loyalty, and fairness matter, and erode employee morale and engagement. According to Hennigan (2007), Towers Perrin, a consulting firm, reports that pay multiple, CEO compensation as a multiple of average employee compensation, is 300-531 for the U.S., 22 for Australia, 21 for Canada, 16 for France, 11 for Germany, and 10 for Japan as of April 2000. Hennigan (2007) further suggests that the pay disparity and global pay gap is getting more serious. For instance, Bob Nardelli, the former Home Depot CEO, broke the record in 2002. His compensation was 1,458 times the average hourly Home Depot employees' compensation.

² While we tackle the reverse causality side of Mahoney and Thorn (2005, 2006), we adopt some of their relevant control variables including CEO ownership, profitability measure of ROA, and leverage variable measured by book value of debt over book value of assets because those variables are also relevant in the reverse causality investigation.

In our opinion, it is the shareholders who ultimately bear the costs of CSR investments. There is an important difference though. Under the overinvestment hypothesis, such investments are inefficient and 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.

Using a large sample of 11,215 firm-year (1,946 firms) observations during the period of 1996–2010, we first examine the relation between CEO compensation and the level of CSR in the previous year. Our results show that the lagged values of CSR are adversely associated with CEO's total compensation as well as cash compensation, after controlling for various firm characteristics and industry effect, supporting the conflict–resolution hypothesis, as opposed to the CSR overinvestment argument. We consider this evidence important because the impact of CSR on CEO compensation is unclear in the previous literature. In addition, we find that the observed inverse association between CSR and executive compensations mostly comes from employee relations. This result also supports the conflict–resolution hypothesis developed from the stakeholder theory, as opposed to the overinvestment explanation based on the agency theory. The negative associations between CEO compensation and lagged CSR as well as employee relations' dimension in CSR remain statistically significant even when we control for potential endogeneity using instrumental variable (IV) approach.

The contributions of this article are twofold. First, we are the first to document a robust negative relation between lagged CSR and CEO compensation. Our results show that CEO pays are on average lower among the US firms that engage in more CSR activities. Second, we add to the growing literature on CSR's role as a means to resolve conflicts among stakeholders. The negative relations between CEO compensation and lagged CSR, and between CEO compensation and the employee relations' dimension in CSR, are consistent with the conflict–resolution hypothesis, but not the overinvestment explanation. Overall, our results suggest that socially responsible firms are more prudent in determining their CEOs' compensation levels.

Our article proceeds as follows. Next section presents our hypotheses, and in “[Data and Measurement](#)” section we describe our sample and define the variables we use. The fourth section presents the empirical results. The last section concludes.

Hypotheses

Despite the large literature on both CSR and executive compensation, there is no unified theory on the relation

between the two. We take two representative but competing explanations, agency theory versus stakeholder theory, to determine their relative importance in CSR–executive compensation relation. First, based on Jensen and Meckling's (1976) agency theory, Barnea and Rubin (2010) consider CSR engagement as a principal–agent relation between managers and shareholders. They argue that affiliated insiders have an interest in overinvesting in CSR if doing so provides private benefits of building reputation as good social citizens, possibly at a cost to shareholders. Milbourn (2003) shows a positive relation between CEO reputation and stock-based compensation after controlling for various firm characteristics and industry effects. As their reputations improve, CEOs will enjoy better outside career opportunities and greater bargaining power, which will eventually increase their ability to negotiate a higher level of compensation. If CEOs tend to overinvest in CSR to build their reputations, then we would expect a positive association between CSR and CEO compensation. In summary, we expect the following:

Hypothesis 1 If the overinvestment hypothesis (based on agency theory) is correct, then the CSR engagement positively affects executive compensation after controlling for confounding factors.

Stakeholder theory, on the other hand, indicates that corporations conduct CSR not only to generate profits and abide bylaws, but also to be ethical and socially supportive (Carroll 1979, 1991, 1999). Freeman (1984) defines stakeholder-management capability as managers' understanding of conceptual mapping among their stakeholders, the organizational process for dealing with these stakeholders and carrying out transactions with their stakeholders that are necessary to achieve the organization's purpose. If managers have the discretion to offer stakeholder protection, then, sometimes, they can become entrenched by building strong relations with non-investing stakeholders and social activists, leading to poor financial performance and large deadweight costs. Cespa and Cestone (2007) suggest that by engaging in CSR, firms can explicitly offer stakeholder protections to prevent underperforming managers from building alliances with stakeholders, and therefore improve the efficiencies in monitoring firm managers.

Boards of directors often fail to represent the best interests of shareholders who elect them. Indeed, there have been substantial shareholder complaints regarding recent executive compensation practice and perceived excesses in executive compensation over many years (Biggs 2005; Pitman 2009; Piore 2010). Some shareholders ratchet up the pressure and actively campaign to unseat some of the directors on boards that are not responsive to shareholder complaints against executive

compensation. Bogle (2008) and Posner (2009) argue that boards, even with the increased proportion of independent directors after Sarbanes-Oxley Act (SOX) of 2002, are still too generous to their executive compensation and fail to adequately discharge their fiduciary obligation for shareholders.

In addition to shareholders' interests, the stakeholder theory proposes that the role of a corporation is to serve the interests of other non-investing stakeholders as well. The growing literature on conflict resolution based on stakeholder theory argues that CSR can help one resolve conflicts between stakeholders (e.g., Jensen 2002; Calton and Payne 2003; Scherer et al. 2006; Harjoto and Jo 2011; Jo and Harjoto 2011a, b). The conflict-resolution explanation is related to at least the following three perspectives. First, to mitigate potential conflicts of interest between managers and stakeholders including shareholders, bondholders, employees, NGOs, social activists, and government, and/or to improve the fairness and inequality concern of a wealth distribution issue, top management of socially responsible firms should take relatively lower pay than those of socially irresponsible firms because top management in socially responsible firms should consider firms' fiduciary and moral responsibilities toward stakeholders (Jensen 2002; Aguilera et al. 2007).

Second, in contrast to the utilitarian and deontological approaches, virtue ethics are also relevant in considering the issue of excessive executive compensation (Potts 2006). It is important to note that not every top manager demands an exorbitant pay. Why do some executives demand hundreds of millions of dollars a year while other executives are content with much less? Virtues, such as self-control, modesty, moderation, unselfishness, and humility, materialize in the form of CSR engagement, and come into play when socially responsible executives who could, but do not, take an excessive compensation compared to their employees to reduce potential conflicts of interest. Socially responsible executives will take on more responsibility than they need to, and receive less credit than they are entitled to. Moriarty (2005) argues that CEOs get paid too much, and socially responsible CEOs should refuse exorbitant pay packages even in well-governed firms, while Bertrand and Mullainathan (2001) suggest that CEOs determine their own pay in poorly governed firms. DesJardins (2009) argues that to some socially responsible management with moderate and constrained desires, an exorbitant pay is simply not an option, and it would be out of character.

Third, if CSR activities are put in place to resolve conflicts among stakeholders, then firms that engage in more CSR activities will have lower conflicts of interest between managers and stakeholders. Other things being equal, such firms should have a lower firm risk (such as

labor strikes, managerial turnover, legislation risk, etc.), resulting in a lower CEO compensation. In summary, we expect that

Hypothesis 2 If the conflict-resolution hypothesis (based on stakeholder theory) is correct, then the CSR engagement inversely influences executive compensation after controlling for confounding factors.

Pay multiple, which is usually defined as the ratio of CEO pay and the average employee compensation, has increased sharply over the last decade. As a result, it has become one of the hottest topics that interest shareholders, management, commentators, regulators, and the social activists alike. Furthermore, Potts (2006) suggests that the primary reason for employees to feel that they are being treated unfairly is often the huge gap between their own pay and the executive compensation. Therefore, we focus our attention on employee relations, a subcategory of firm's CSR engagement, and examine its association with CEO pay. As a top manager, the CEO typically serves as the nexus of all stakeholders of the firm, and oversees manager-employee relationship as well as the owner-manager relationship to represent the best interest of the firm, one of which is to survive as a financially stable enterprise providing wages and benefits to employees, goods and services to consumers, and a competitive rate of return on investment to shareholders (DesJardins 2009).

Recently, Desai et al. (2010) have argued that pay disparity between top management and average employees results in "power asymmetries" in the workplace such that top executives view lower level employees as dispensable objects not worthy of human dignity. Using employee data and comparing employee complaint information against executive compensation figures, they find that the higher a firm pays its executives, the higher its overall meanness score for mistreating employees. In addition, high-income managers are more likely to fire their employees than low-income managers.

Under the overinvestment hypothesis, CSR engagement is an inefficient investment outcome of a powerful CEO who enjoys the private benefit of improved reputation in the society. The CEO can form a strong alliance with his employees by building better employee relations. In fact, Cronqvist et al. (2009) find that entrenched CEOs pay their workers more, and argue that entrenched CEOs paying more to enjoy private benefits such as lower effort in wage bargaining and improved social relations with employees. The greater bargaining power of the CEO also leads to a higher compensation. Therefore, the overinvestment hypothesis implies a positive association between employee relations and CEO pay. On the other hand, under the conflict-resolution hypothesis, better employee

relations is either the result of CEOs with high social and ethical standards whose virtue does not allow them to demand extraordinarily high compensation, or a means to reduce potential conflicts that may lead to labor strikes and lower productivity. We would, therefore, expect an inverse association between employee relations and CEO pay under the conflict–resolution hypothesis.⁴

Hypothesis 3 According to the conflict–resolution hypothesis, strong employee relations inversely affect executive compensation, whereas the overinvestment hypothesis predicts a positive association between employee relations and executive compensation.

Data and Measurement

Data

We use CSR measures from the Kinder, Lydenberg, and Domini’s (KLD’s) Stats database, which covers more than 3,000 companies listed on the Russell 2000, S&P 500, and Domini 400 Social Indexes from 1995 to 2009. This database contains various measures of CSR characteristics. In particular, KLD’s inclusive social rating criteria contain strength ratings and concern ratings for community, diversity, employee relations, environment, and product quality. We report a list of strength and items of concern in the KLD social ratings in Appendix 1.

Our CEO compensation data come from Standard and Poor’s ExecuComp database from 1996 to 2010. This database contains detailed information on executive compensation such as salary, bonus, options and stock awards, pensions, and other compensation items for S&P 1500 firms. It is the most widely used compensation database by accounting, economics, finance, and management scholars. We merge executive compensation data with KLD ratings in the previous fiscal year, and require firms to have sufficient accounting information from COMPUSTAT in the previous year. In addition, we obtain board characteristics from RiskMetrics (formerly IRRC) Director database, which covers directors of S&P500,

S&P MidCaps, and S&P SmallCaps firms from 1996 to 2010. This matching procedure produces a final sample of 1,946 firms from 1996 to 2010, with a total of 11,215 firm-year observations.

Measurement

Measurement of Executive Compensation

We use two different measures of CEO compensation as in Hwang and Kim (2009): *Total Compensation* and *Cash Compensation*. As we discussed earlier, while the main research focus of Mahoney and Thorn (2005, 2006) was to examine the impact of lagged executive compensation structure on CSR engagement, our research emphasis is to examine the impact of CSR engagement on executive compensation. Thus, it is important to use total compensation rather than self-reported CEO compensation. We obtain *Total Compensation* directly from ExecuComp item “TDC1,” which is calculated as the sum of salary, bonus, other annual pay, the total value of restricted stock granted that year, the Black–Scholes (1973) value of stock options granted that year, long-term incentive payouts, and all other total compensation. *Cash Compensation* consists of base salary and bonus.

CSR Measures

Kinder, Lydenberg, and Domini’s database provides a binary (0, 1) indicator for each strength and concern activity in subcategories, including community, diversity, employee relations, environment, and product quality. We follow Hillman and Keim (2001) and Baron et al. (2010) to construct an aggregate *CSR Composite Index*. Letting C^{ijt} denote an indicator variable of CSR for firm i with strength j for year t from Appendix 1 and C^t the maximum number of KLD strengths in year t for any firm, the index C^{it} of CSR composite for firm-year observation it is

$$C^{it} = \frac{\sum_j C^{ijt}}{C^t}$$

Appendix 2 provides a detailed explanation of the construction of this index. For robustness, we also construct two alternative measures of CSR: *Net CSR* and *CSR Indicator*. *Net CSR* is defined as the difference between the number of all strength items a firm has engaged in and the number of all concern items it has. *CSR Indicator* is a dummy variable which equals to one if a firm has engaged in CSR activities, and zero otherwise.

⁴ Regarding social responsibility of executive pay, one of the earliest corporate pioneers in the area of stakeholder relations was Ben & Jerry’s, an American ice cream company. Ben & Jerry’s used to have a pay multiple policy that no employee could earn more than seven times the salary of the lowest paid worker in the company. In 1995, entry-level employees were paid \$8 hourly, and the highest paid employee was President and Chief Operating Officer Chuck Lacey, who earned \$150,000 annually. When Ben Cohen resigned as CEO and Ben & Jerry’s announced the search for a new CEO in 1995, the company ended the seven-to-one-ratio pay multiple policy (Carlin, 1995), because Ben & Jerry’s was unable to attract an acceptable top quality executive, and it had to loosen the compensation restriction.

Firm and Governance Characteristics

Following the standard executive compensation literature, we include a number of firm characteristics which could affect CEO compensation as control variables in our analysis. These variables include *Firm size*, *Tobin's Q*, *Leverage*, and *ROA*. Previous research has established a significantly positive relation between firm size and CEO compensation (Baker et al. 1988; Murphy 1999). Bebchuk and Fried (2003) suggest a rent-seeking view that managers exploit firm size to justify their higher compensation, while it could also be explained by a market-based view that larger firms employ superior executives and they get paid better (Rosen 1982). We measure firm size with the book value of total assets. In addition, firms with higher growth opportunities are likely to need better executives, so the executive compensation would be higher. We use *Tobin's Q* as a proxy for growth opportunity, which is the ratio of the market value of assets over the book value of assets (Tobin 1958).⁵ To control for prior firm performance, we include *ROA* in our regressions, which is the ratio of operating income before depreciation scaled by book value of total assets.

We also construct several corporate governance measures (*CEO ownership*, *Board size*, and *Board independence*) from the RiskMetrics database and include them as extra control variables. *CEO ownership* is the percentage of the company's shares that are owned by the CEO. *Board size* is the total number of directors on the board, and we define *Board independence* as the fraction of independent directors on the board. The findings in Yermack (1996) suggest that smaller boards are more effective monitors. Similarly, Weisbach (1988) and Rosenstein and Wyatt (1990) suggest that firms with a greater fraction of independent outside directors perform better. However, both empirical and theoretical research in corporate governance has evolved significantly since these earlier articles and more recent findings show that the definition of optimal governance varies as a function of firm characteristics and what might be optimal for one firm may be ineffective for another firm.⁶ Therefore, we lack a clear prediction on the effect of board size and independence on executive compensation given the recent findings that large boards and

boards with greater insider representation may be optimal for some firms. See variable definitions and data source in Table 1.

Empirical Results

Univariate Tests

Table 2 Panel A summarizes our sample. We report the means, medians, and standard deviations of various CSR measures, CEO compensations, and firm characteristics. There is a considerable amount of variation in CEO compensation in our sample. The average total compensation of the CEOs in our sample is \$5.70 million, with a standard deviation of \$6.35 million. Approximately a quarter of the total compensation is in the form of salary and bonus, with the remaining being stocks and option compensations. Both total and cash compensation have large positive skewness, suggesting that the pays of some CEOs in our sample are extraordinarily large. We therefore use the natural logarithm of the compensations in our regression analysis.

To explore the potential impact of CSR on CEO compensation, we compare the means of CEO compensation for the subsample of firms with above-median *CSR Composite Index* and those with below-median *CSR Composite Index* in Table 2 Panel B. CEO compensations, both total and cash compensation, are significantly higher for firms with above-median CSR. This result is not surprising since firms with above-median *CSR Composite Index* also tend to be larger in firm size. In addition, such firms have a higher *Tobin's Q* and a lower leverage ratio, and are more profitable with bigger boards and fewer independent directors.

Table 3 presents the Spearman correlation matrix for various CSR measures, CEO compensations, and firm and board characteristics. We notice that firm size is strongly positively correlated with CEO compensation as well as CSR measures. Other firm and board characteristics which have been documented to impact CEO compensation also have significant correlation coefficients with our CSR measures. Therefore, we proceed to a multivariate test to examine the incremental effect of CSR on executive compensation.

Multivariate Tests

CEO Compensation and Overall CSR Measures

We run the following regressions with industry- and year-fixed effects to study the incremental influence of CSR on CEO compensation:

⁵ Tobin's *Q* (1958) is widely used as a measure of growth opportunity in accounting, finance, and economics. See, for example, Chung and Pruitt (1994) and Chung and Jo (1996), among others. Following Chung and Pruitt (1994), Tobin's *Q* is calculated from the formula: $\{[\text{Market value of common stock} + \text{Book value of preferred stock} + \text{Book value of long-term debt} + \text{Book value of current liabilities} - (\text{Book value of current assets} - \text{Book value of inventories})] / \text{Book value of total assets}\}$.

⁶ See, among others, Raheja (2005), Adams and Ferreira (2007), Boone et al. (2007), and Harris and Raviv (2008).

Table 1 Variable definitions and data source

Variables	Definitions	Data source
<i>Measures of CSR</i>		
CSR Composite Index	An aggregate CSR index following Hillman and Keim (2001) and Baron et al. (2010) (see Appendix 2)	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 indicator	Indicator variable: 1 for firms that has engaged in more strength items than concern items, 0 otherwise	KLD
<i>Measures of executive compensation</i>		
Cash compensation	Sum of base salary and bonus (in thousands)	ExecuComp
Total compensation	ExecuComp item “TDC1”, which is calculated as the sum of salary, bonus, other annual pay, the total value of restricted stock granted that year, the Black–Scholes value of stock options granted that year, long-term incentive payouts, and all other total compensation (in thousands)	ExecuComp
<i>Firm and governance characteristics</i>		
Firm size	Book value of total assets	Compustat
Tobin’s <i>Q</i>	Market value of assets over book value of assets	Compustat
Leverage	Book value of debt over book value of assets	Compustat
ROA	Operating income before depreciation, scaled by book value of assets	Compustat
CEO ownership (%)	Percentage ownership of CEO shares	RiskMetrics
Board size	Total number of directors on board	RiskMetrics
Board independence	Percentage of independent directors on board	RiskMetrics

$$\begin{aligned} \log(\text{Compensation}_{i,t}) = & \alpha_0 + \alpha_1 \text{Year} + \alpha_2 \text{Industry} \\ & + \beta_1 \text{CSR}_{i,t-1} + \beta_2 \log(\text{size}_{i,t-1}) \\ & + \beta_3 \text{Tobin's } Q_{i,t-1} \\ & + \beta_4 \text{leverage}_{i,t-1} + \beta_5 \text{ROA}_{i,t-1} \\ & + \beta_6 \text{CEOOwnership}_{i,t} \\ & + \beta_7 \log(\text{BoardSize}_{i,t}) \\ & + \beta_8 \text{BoardInd}_{i,t} + \varepsilon_{i,t} \end{aligned}$$

Based on Core et al. (1999) and Hwang and Kim (2009), we use lagged values of the economic determinants and contemporaneous values of the governance variables. We obtain similar results if we use lagged values of the governance variables instead.

Our results are summarized in Table 4. Consistent with the previous literature, we find that on average, both cash and total compensation are higher for larger firms and firms that are more profitable. Compensation tends to be higher for CEOs in firms with better corporate governance, as measured by the equity ownership of the CEO and the percentage of independent directors.⁷ This is consistent with Hermalin (2005) who argues that if CEO’s job stability is negatively affected by the increase in monitoring

intensity due to stricter corporate governance, then firms optimally respond by increasing the level of CEO pay.

Controlling for these firm and governance characteristics, we find that the CSR variables always have negative and statistically significant coefficients, suggesting that CEO compensation is on average lower in firms with higher levels of CSR. An interquartile increase in *CSR Composite Index* (0.054) is associated with a 4.35% decrease in total compensation, and a 2.78% decrease in cash compensation. Our results are qualitatively similar if we use other CSR measures. An interquartile increase in *Net CSR* is associated with 2.76% (1.78%) reduction in total (cash) compensation. Similarly, the total (cash) compensation is 5.45% (4.50%) lower for CEOs in firms engaging in more strength items than concern items than other firms. Therefore, our results do not support the overinvestment hypothesis (Hypothesis 1), but are consistent with the conflict–resolution hypothesis (Hypothesis 2).

CEO Compensation and Employee Relations

Our Hypothesis 3 predicts a negative (positive) relation between employee relations and CEO compensation according to the conflict–resolution (the overinvestment) hypothesis. To test this hypothesis, we perform similar tests on one CSR subcategory, *Employee relations*, and report the results in Table 5.

⁷ In our sample, CEO ownership is not statistically different between firms with above-median CSR scores and those with below-median CSR scores (Panel B of Table 2). However, in our later multivariate regressions (Table 4), we find that CEO compensation decreases with CEO ownership.

Table 2 Descriptive statistics and difference tests

	<i>N</i>	Mean	Median	SD	25 percentile	75 percentile
Panel A: Summary statistics						
<i>CSR measures</i>						
CSR Composite Index	11,215	0.441	0.442	0.046	0.410	0.464
Net CSR	11,215	0.262	0.000	2.295	−1.000	1.000
CSR indicator	11,215	0.385	0.000	0.487	0.000	1.000
Employee relation	11,215	0.469	0.455	0.093	0.400	0.500
<i>Compensation measures</i>						
Total compensation	11,215	5,697	3,609	6,349	1,793	7,006
Cash compensation	11,215	1,431	1,008	1,263	700	1,705
<i>Firm characteristics</i>						
Firm size	11,215	13,155	2,681	37,271	914	8,891
Tobin's <i>Q</i>	11,215	1.98	1.56	1.24	1.19	2.27
Leverage	11,215	0.22	0.21	0.16	0.07	0.33
ROA	11,215	0.14	0.13	0.09	0.08	0.19
CEO ownership	11,215	1.69	0.24	4.44	0.07	0.90
Board size	11,215	9.82	10.00	2.59	8.00	11.00
Board independence	11,215	72.15	75.00	14.49	62.50	83.33
		Above CSR median Mean		Below CSR median Mean		<i>t</i> -stat
Panel B: Difference tests						
<i>CSR measures</i>						
CSR Composite Index		0.476		0.407		122.08***
Net CSR		1.890		−1.371		107.05***
CSR indicator		0.748		0.020		119.33***
Employee relation		0.512		0.425		56.83***
<i>Compensation measures</i>						
Total compensation		6,112		5,281		6.94***
Cash compensation		1,552		1,310		10.19***
<i>Firm characteristics</i>						
Firm size		15,500		10,802		6.69***
Tobin's <i>Q</i>		2.143		1.825		13.74***
Leverage		0.207		0.228		−6.79***
ROA		0.145		0.136		6.03***
CEO ownership		1.702		1.678		0.29
Board size		10.145		9.492		13.42***
Board independence		71.024		73.277		−8.26***

Notes: Panel A reports the mean, median, standard deviation, top quarter, bottom quarter summary statistics for 11,215 firm-year observations from 1996 to 2010. Panel B presents the mean summary statistics for two subsamples with CSR Composite Index below and above the median value of sample CSR. Difference in mean is reported in *t*-statistics. All variable definitions are in Table 1. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively

In the total compensation regression, the *Employee relations* variable has a negative coefficient of -0.755 , statistically significant at the 1% level. The effect appears to be economically large. An interquartile increase in *Employee relations* (0.10) is associated with 7.27% decrease in CEOs' total compensation. Our result on cash compensation is similar. An interquartile increase in

Employee relations is associated with 4.72% decrease in CEOs' cash compensation. A higher score in employee relations might be the result of the CEO's constrained desires for excessive pay, and/or a sign of lower firm risk, which also might lead to lower CEO compensation. Our results are consistent with this argument, and support the conflict-resolution hypothesis (Hypothesis 3).

Table 3 Bivariate correlation matrix

No.	1	2	3	4	5	6	7	8	9	10	11	12
1	1											
2	0.9703*	1										
3	0.7485*	0.7675*	1									
4	0.0877*	0.1049*	0.1118*	1								
5	0.1249*	0.0844*	0.0852*	0.6332*	1							
6	0.1316*	0.1542*	0.1792*	0.5616*	0.4791*	1						
7	0.1630*	0.1500*	0.1158*	0.0732*	-0.2295*	0.2995*	1					
8	-0.0436*	-0.0579*	-0.0494*	0.1480*	0.1819*	0.2995*	-0.2761*	1				
9	0.0680*	0.0603*	0.0449*	0.0529*	0.0294*	-0.2575*	0.6121*	-0.1444*	1			
10	-0.0145	-0.0215*	-0.0173	-0.2059*	-0.1505*	-0.1619*	0.0937*	-0.1251*	0.0575*	1		
11	0.1726*	0.1717*	0.1754*	0.3008*	0.3421*	0.6034*	-0.1746*	0.2143*	-0.1297*	-0.1656*	1	
12	-0.0755*	-0.009	0.0129	0.1636*	0.0318*	0.1368*	-0.1071*	0.0843*	-0.0668*	-0.2251*	0.0497*	1

Notes: This table reports the Spearman correlation coefficients among variables for the 11,215 firm-year observations from 1996 to 2010. All variable definitions are in Table 1. ***, **, and * stand for statistical significance at the 1, 5, and 10% level, respectively

Instrumental Variable Approach

In our analysis, we have carefully controlled for firm characteristics and governance variables that are known to matter for CEO compensation. We also use lagged CSR measures to address the potential problems of reverse causality and simultaneity. However, we cannot completely rule out the possibility that some omitted variables might be driving the results, i.e., the negative relation between CEO compensation and CSR that we document is driven by some unobserved firm characteristics. To address this concern, we take the IV estimation approach.⁸

We use the industry-median CSR as an IV because it is likely to fulfill both the relevancy condition and the exclusion restriction. Prior research suggests that the level of CSR may vary considerably across industries due to the nature of the products produced, regulatory environment, shifts in social norms, or certain problems arose in a social arena (e.g., Waddock and Graves 1997; McWilliams and Siegel 2001; Fisman et al. 2005). Therefore, we expect firm-level CSR to be closely related to its industry norm, as captured by its industry-median CSR. At the same time, it is not obvious why the industry-median CSR should be linked to the compensation level of the firm’s CEO. In our sample, our unreported results suggest that the correlation coefficient between firm-level *CSR Composite Index* and its industry-median value is 0.45 and statistically significant at the 1% level. In contrast, there is no statistically significant correlation between industry-median CSR and CEO compensation measures.

We estimate the following pooled time-series cross-sectional Two-Stage Least Squares (2SLS) regressions of $\log(\text{Compensation})$ on controls and lagged CSR instrumented. In the first-stage, we estimate firm-level CSR in a given year, using industry-median CSR based on Fama–French (1997) 48 industry classification in that year as an instrument. The control variables are those in Table 4.

⁸ Moffitt (1999) suggests using the IV method, which focuses on finding a variable (or variables) that influences the first-stage, but does not influence the second-stage dependent variable (and thus, is not correlated with the random error term in the second-stage equation). Angrist (2000) asserts that the IV method works if the researcher focuses on the causal effects. Moffitt (1999) further suggests that each IV that is indeed uncorrelated with the random error term in the second-stage (i.e., executive compensation) equation will yield unbiased estimates. Certain IVs will yield more precise estimates, however. The more the highly correlated the IV is with the first-stage dependent variable, i.e., CSR engagement, the more precise the estimates will be. Thus, the challenge in an IV estimation is to find an appropriate IV that is highly correlated with the first-stage CSR variable, but uncorrelated with the second-stage executive compensation. Unfortunately, it is often hard to find variables that meet both of these requirements, and therefore, it is difficult to find good IVs among the many potential IVs.

Table 4 The impact of lagged CSR on CEO compensation

	Log(total compensation)			Log(cash compensation)		
	(1)	(2)	(3)	(4)	(5)	(6)
CSR Composite Index	-0.824*** (0.006)			-0.522** (0.038)		
Net CSR		-0.014** (0.011)			-0.009** (0.050)	
CSR indicator			-0.056** (0.029)			-0.046** (0.034)
Log(firm size)	0.415*** (0.000)	0.415*** (0.000)	0.415*** (0.000)	0.228*** (0.000)	0.228*** (0.000)	0.229*** (0.000)
Tobin's Q	0.090*** (0.000)	0.090*** (0.000)	0.089*** (0.000)	-0.031** (0.027)	-0.031** (0.026)	-0.031** (0.025)
Leverage	0.180** (0.039)	0.181** (0.038)	0.178** (0.041)	0.113 (0.119)	0.113 (0.118)	0.109 (0.132)
ROA	1.493*** (0.000)	1.493*** (0.000)	1.484*** (0.000)	1.437*** (0.000)	1.438*** (0.000)	1.432*** (0.000)
CEO ownership	-0.025*** (0.000)	-0.025*** (0.000)	-0.025*** (0.000)	-0.012*** (0.004)	-0.012*** (0.004)	-0.012*** (0.004)
Log(board size)	-0.129 (0.121)	-0.131 (0.117)	-0.138* (0.095)	0.106 (0.213)	0.105 (0.216)	0.102 (0.227)
Board independence	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.002** (0.039)	0.002** (0.038)	0.002** (0.035)
Constant	4.663*** (0.000)	4.302*** (0.000)	4.341*** (0.000)	5.108*** (0.000)	4.879*** (0.000)	4.900*** (0.000)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,215	11,215	11,215	11,215	11,215	11,215
Adj. R^2	0.433	0.433	0.433	0.374	0.374	0.374

Notes: This table presents OLS regressions for the sample of 11,215 firm-year observations between 1996 and 2010. The dependent variable in regression (1)–(3) is the natural log of total compensation at year t , and the dependent variable in regression (4)–(6) is the natural log of cash compensation at year t . All the financial variables are measured at year $t - 1$, and the CEO ownership and board characteristics are measured at year t . All the regressions control for fiscal year-fixed effects and ten Fama–French (1997) industry-fixed effects whose coefficients are suppressed for brevity. p -Values based on standard errors adjusted for heteroskedasticity (White 1980) and firm clustering are reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively

$$\begin{aligned} \log(\text{Compensation}_{i,t}) &= \alpha_0 + \alpha_1 \text{Year} + \beta_1 \text{CSR}_{i,t-1} \\ &+ \sum_{j=2}^8 \beta_j x_j + \varepsilon_{i,t} \\ \text{CSR}_{i,t-1} &= \gamma_0 + \gamma_1 \text{Year} \\ &+ \delta_1 \text{IndustryMedianCSR}_{i,t-1} \\ &+ \sum_{j=2}^8 \delta_j x_j + v_{i,t-1} \end{aligned}$$

where x_j is the set of exogenous control variables, $x_j = \{\log(\text{size}_{i,t-1}), \text{Tobin's } Q_{i,t-1}, \text{leverage}_{i,t-1}, \text{ROA}_{i,t-1}, \text{CEOOwnership}_{i,t}, \log(\text{BoardSize}_{i,t}), \text{BoardInd}_{i,t}\}$

Table 6 summarizes our results from 2SLS IV estimations of total CEO compensation. For completeness, we report both first-stage and second-stage results. The first two

columns present results with *CSR Composite Index*, and the last two columns report results with *Employee relations*. As reported in Column 1 Table 6, the industry-median CSR is highly statistically significant, even after controlling for all other firm and board characteristics. The coefficient is 0.978, suggesting that an increase in industry-median CSR is associated with an increase in the firm-level CSR by almost the same amount. Our instruments are not weak either. Staiger and Stock (1997) suggest that one indication of the strength of an instrument is that the F -statistic of the joint significance of the instruments should be larger than 10. Since we have only one instrument, the F -statistic is equal to the squared t -stat, which is 1,422 (37.71²). Our conclusion with industry-median *Employee relations* is similar. Column 3 shows that the industry-median *Employee relations* has a coefficient of 0.444 that is also

Table 5 The impact of lagged employee relations on CEO compensation

	(1) Log(total compensation)	(2) Log(cash compensation)
Employee relations	−0.755*** (0.000)	−0.483*** (0.000)
Log(firm size)	0.417*** (0.000)	0.229*** (0.000)
Tobin's <i>Q</i>	0.092*** (0.000)	−0.030** (0.028)
Leverage	0.170** (0.049)	0.106 (0.141)
ROA	1.514*** (0.000)	1.451*** (0.000)
CEO ownership	−0.026*** (0.000)	−0.012*** (0.003)
Log(board size)	−0.140* (0.088)	0.099 (0.233)
Board independence	0.005*** (0.000)	0.002* (0.051)
Constant	4.680*** (0.000)	5.121*** (0.000)
Year fixed effect	Yes	Yes
Industry fixed effect	Yes	Yes
Observations	11,215	11,215
Adj. <i>R</i> ²	0.436	0.376

Notes: This table presents OLS regressions for the sample of 11,215 firm-year observations between 1996 and 2010. The dependent variable in regression (1) is the natural log of total compensation at year *t*, and the dependent variable in regression (2) is the natural log of cash compensation at year *t*. All financial variables are measured at year *t* − 1, and the CEO ownership and board characteristics are measured at year *t*. All the regressions control for fiscal year-fixed effects and ten Fama–French (1997) industry-fixed effects whose coefficients are suppressed for brevity. *p*-Values based on standard errors adjusted for heteroskedasticity (White 1980) and firm clustering are reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively

statistically significant at the 5% level. The associated *t*-stat is 14.96, which translates into an *F*-statistic of 223.8.

Using industry-median values as instruments, we find significantly negative coefficients on the instrumented CSR at the 10% level, suggesting that the negative relation between CEO compensation and levels of CSR in the previous year is unlikely driven by some unobserved firm characteristics, and that levels of past CSR have a causal effect on levels of CEO total compensation. Although the statistical significance is somewhat weaker, our IV results lend support to the conflict–resolution hypothesis as opposed to the overinvestment hypothesis with accounting for endogeneity.

Discussion

The main purpose of this article is to empirically investigate the impact of CSR engagement on subsequent executive compensation. For this task, we make use of the KLD data since it is the most comprehensive and widely used data on CSR research by accounting, economics, finance, and management scholars. However, we are aware of its limitations. One caveat of the KLD data is its unbalanced panel structure and certain construct–validity issues (Chatterji et al. 2009). Another potential concern is that KLD ratings come from KLD's own assessment of a firm's CSR based on surveys and KLD's in-house analysis, but they do not reflect feedbacks from various stakeholders. Given the limitation of the KLD data, we believe that it is worthwhile to study the relation between CSR and executive compensation using alternative data sources that incorporate various stakeholders' input in the future.

It is possible that a powerful CEO can determine his own compensation, and meanwhile also decide the level of CSR engagement. We are aware of this concern and have addressed this issue in three ways. First, we control for CEO power by including some corporate governance variables, such as board independence and CEO ownership. Second, we run IV regressions to mitigate such potential omitted variable bias, using industry-median CSR as the instrument. Our results are quite robust to both specifications, suggesting that our results are less likely to be driven by unobserved firm characteristics such as CEO power. Third, in our untabulated results, we further check CEO power measured by the CEO duality and its impact on CEO compensation.⁹ After adding this new CEO duality variable that proxies for CEO power, our main results of the relation between CSR and compensation still hold and the statistical significance does not really change.

We study CEO compensation of the S&P 1500 companies covered by ExecuComp database.¹⁰ As such, we investigate the behavior of companies that represent approximately 85% of the US equity market. Our sample firms are likely to be more financially viable, transparent, and closely followed by the investment community. Consequently, our conclusion might not apply to other types of firms.

⁹ The CEO is responsible for leading the firm's management, whereas the chairman of the board (COB) is responsible for leading the board. Sometimes, one individual often holds two positions, CEO and COB, commonly known as a CEO duality (Brickley et al. 1997).

¹⁰ According to *Wharton Research Data Services* (WRDS), "Standard and Poors' Execucomp database provides executive compensation data collected directly from each company's annual proxy (DEF14A SEC form). Detailed information on salary, bonus, options and stock awards, non-equity incentive plans, pensions and other compensation items are available."

Table 6 The impact of lagged CSR and employee relations on CEO compensation based on instrumental variable method

	(1) First-stage CSR index	(2) Second-stage Log(total compensation)	(3) First-stage CSR index	(4) Second-stage Log(total compensation)
Industry-median CSR index	0.978*** (0.000)			
Instrumented CSR index		-1.501* (0.073)		
Industry-median employee relations			0.444** (0.000)	
Instrumented employee relations				-1.647* (0.095)
Log(firm size)	0.003*** (0.000)	0.396*** (0.000)	0.006*** (0.000)	0.404*** (0.000)
Tobin's Q	0.004*** (0.000)	0.022 (0.801)	0.006*** (0.000)	-0.004 (0.966)
Leverage	-0.016** (0.000)	1.651*** (0.000)	-0.035** (0.000)	1.666*** (0.000)
ROA	0.014** (0.014)	0.125*** (0.000)	0.018 (0.135)	0.129*** (0.000)
CEO ownership	-0.000 (0.338)	-0.027*** (0.000)	-0.000 (0.006)	-0.028*** (0.000)
Log(board size)	0.014*** (0.000)	-0.186** (0.033)	0.004*** (0.344)	-0.216** (0.011)
Board independence	0.000*** (0.000)	0.005*** (0.000)	-0.000** (0.822)	0.005*** (0.000)
Constant	-0.057*** (0.000)	5.035*** (0.000)	0.236*** (0.000)	5.234*** (0.000)
Year fixed effect	Yes	Yes	Yes	Yes
Observations	11,215	11,215	11,215	11,215
Adj. R^2	0.270	0.397	0.270	0.398
F -stat	189.27		168.19	

Notes: This table presents first-stage and second-stage regression coefficients for the sample of 11,215 firm-year observations between 1996 and 2010. The dependent variable in regression (1) is the CSR Composite Index, and we use industry-median CSR index as an instrument. In second-stage regression (2), we use the estimated CSR index from first-stage regressions as an independent variable and rerun our baseline regression of CEO compensation with instrumented CSR index. The dependent variable in regression (3) is employee relation, and we use industry-median employee relation as an instrument. In second-stage regression (4), we use the estimated employee relation from first-stage regressions as an independent variable and rerun our baseline regression of CEO compensation with instrumented employee relations. All financial variables are measured at year $t - 1$, and the CEO ownership and board characteristics are measured at year t . All regressions control for fiscal year fixed effects whose coefficients are suppressed for brevity. p -Values based on standard errors adjusted for heteroskedasticity (White 1980) and firm clustering are reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively

Despite these limitations, our findings contribute to the literature on CSR by providing some empirical evidence on the causal effect of CSR on executive compensation. While we find that CSR is one important factor in the cross-sectional differences in CEO compensation, we do not attempt to determine the optimal level of CEO pay. The causality among CSR engagement, executive compensation, and firm value, while important, is also beyond the scope of this article. It would also be fruitful to investigate the impact of CSR engagement on stock price from investors' perspectives. We leave these important questions to future research.

Conclusion

Executive compensation has been a topic of great interest for shareholders, government regulators, and academic researchers. In this article, we examine the empirical impact of firms' CSR involvement on executive compensation using a large sample of the US firms from 1996 to 2010. We find that lagged CSR is adversely related to CEOs' total compensation as well as cash compensation, after controlling for various firm and board characteristics. We also find an inverse association between executive compensation and employee relations. Our

results hold up well even when we control for potential endogeneity using the IV approach. This negative relation between CSR and CEO compensation is consistent with the conflict–resolution hypothesis based on stakeholder theory.

We contribute to the existing literature on CSR and executive compensation in two ways. First, Mahoney and Thorn (2005, 2006) study the impact of CEOs’ compensation structure on CSR engagement for a small group of Canadian firms. We investigate the difference in CEO pay between socially responsible firms and irresponsible firms. In our large sample of the US firms, we find that CEOs in socially responsible firms receive significantly lower pay than CEOs in otherwise similar but socially irresponsible firms. Second, by using a 2SLS IV approach to control for endogeneity, we find that higher levels of CSR is associated with lower CEO compensation in the following year. Our findings reveal that the CSR–executive compensation nexus of socially responsible firms is indeed different from that of socially irresponsible firms, suggesting that the top management of the US socially responsible firms, on average, care more for their employees and have better self-control rather than follow the path of greed.

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Appendix 1 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 peoples relations ('00–'01)
	Support for education (added '94)	Other concern
	Indigenous peoples 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

Appendix 1 continued

KLD inclusive social ratings		
Category	Strength items	Concern items
Diversity	Alternative fuels	Substantial emissions
	Communications (added '96)	Agricultural chemicals
	Property, plant, and equipment (ended '95)	Climate change (added '99)
	Other strength	Other concern
	CEO	Controversies
	Promotion	Non-representation
	Board of directors	Other concern
	Family benefits	
	Women/minority contracting	
	Employment of the disabled	
Employee relations	Progressive gay & lesbian policies	
	Other strength	
	Strong union relations	Poor union relations
	No layoff policy (ended '94)	Health safety concern
	Cash profit sharing	Workforce reductions
	Employee involvement	Pension/benefits (added '92)
	Strong retirement benefits	Other concern
Product quality and safety	Health and safety strength (added '03)	
	Other strength	
	Quality	Product safety
	R&D/innovation	Marketing/contracting controversy
	Benefits to economically disadvantaged	Antitrust
	Other strength	Other concern

Notes: We borrow this appendix from Harjoto and Jo (2011). All items are listed in their corresponding category. Unless otherwise indicated, the item has been included in the data from 1991 to 2009. Items that were added to the data or discontinued (i.e., ended) in intermediate years are indicated, as are the cases in which an item was moved from one category to another. Further details on the definition of each indicator are available from KLD Research & Analytics, Inc. at http://www.kld.com/research/ratings_indicators.html

Appendix 2 Calculation of the CSR Composite Index

Combined strength and concern scores

COMMUNITY(i,t) = (sum of all community strength items for firm i at year t minus the sum of all community concern items for firm i at year t plus total maximum possible number of community concern items at year t) divided by (total maximum possible number of community strength items during year plus total maximum possible number of community concern items at year t)

ENVIRONMENT(i,t) = (sum of all environment strength items for firm i at year t minus the sum of all environment concern items for firm i at year t plus total maximum possible number of environment concern items at year t) divided by (total maximum possible number of environment strength items during year plus total maximum possible number of environment concern items at year t)

DIVERSITY(i,t) = (sum of all diversity strength items for firm i at year t minus the sum of all diversity concern items for firm i at year t plus total maximum possible number of diversity concern items at year t) divided by (total maximum possible number of diversity strength items during year plus total maximum possible number of diversity concern items at year t)

EMPLOYEE RELATIONS(i,t) = (sum of all employee strength items for firm i at year t minus the sum of all employee concern items for firm i at year t plus total maximum possible number of employee concern items at year t) divided by (total maximum possible number of employee strength items during year plus total maximum possible number of employee concern items at year t)

PRODUCT(i,t) = (sum of all product strength items for firm i at year t minus the sum of all product concern items for firm i at year t plus total maximum possible number of product concern items at year t) divided by (total maximum possible number of product strength items during year plus total maximum possible number of product concern items at year t)

CSR Composite Index = (COMMUNITY + ENVIRONMENT + DIVERSITY + EMPLOYEE + PRODUCT)/5

Notes: This calculation is following Hillman and Keim (2001) and Baron et al. (2010)

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