

Corporate social responsibility and cost stickiness

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Abstract: This paper examines the effects on cost stickiness of firms' involvement in corporate social responsibility (CSR) activities. Cost stickiness represents asymmetric cost behaviour whereby the magnitude of cost increases in response to an increase in activity level is greater than the magnitude of cost decreases with a decrease in activity level. We hypothesize that CSR involvement requires ongoing investments in value-creating activities that may involve significant downward adjustment costs during periods of revenue shocks, giving rise to cost stickiness. We use two different CSR proxies and find support for our hypothesis. We further decompose CSR into CSR strengths and CSR concerns and find that cost stickiness is more pronounced for CSR strengths. Finally, we examine cost stickiness for four individual CSR components, namely, environment, employees, product, and community, and find costs to be sticky for the CSR strengths dimension for all components.

Keywords: Corporate social responsibility; asymmetric cost behaviour; KLD.

1. Introduction

We examine the effect of firms' CSR involvement on cost stickiness, where "...costs are sticky if the magnitude of the increase in costs associated with an increase in volume is greater than the magnitude of the decrease in costs associated with an equivalent decrease in volume" (Anderson, Banker, & Janakiraman, 2003, p. 48). The conventional model of cost accounting, as well as activity-based costing, posits that costs are proportional to the cost drivers (Noreen, 1991). However, subsequent research has found a more complex relationship between cost and activities whereby some costs rise more when activity increases but do not fall proportionately with a decrease in activity (Cooper & Kaplan, 1998). Anderson et al. (2003) use firm-level selling, general, and administrative (SG&A) expenses as cost components, and confirm cost stickiness.¹

We examine a hitherto unexplored determinant of cost stickiness: firms' involvement in CSR activities. Based predominantly on agency and stakeholder theory, some studies have argued that employing valuable firm resources to engage in CSR can have significant managerial benefits, (Freeman, 1984; Wartick & Cochran, 1985; Wood, 1991). CSR can also have a positive impact by providing better access to valuable resources (Cochran & Wood, 1984; Waddock & Graves, 1997) and by attracting and retaining higher-quality employees (Greening & Turban, 2000; Turban & Greening, 1997), thus allowing for better marketing of products and services (Fombrun, 1996; Moskowitz, 1972), and creating unforeseen opportunities (Fombrun, Gardberg, & Barnett, 2000). Furthermore, CSR involvement can mitigate the likelihood of negative

¹ Other researchers extend Anderson et al. (2003) by investigating the stickiness of other costs, e.g., COGS, labour costs, R&D expenditures and advertising expense, and for different levels (such as inter-department, inter-firm, inter-industry, and inter-country comparisons) (e.g., Balakrishnan & Gurca, 2008; Calleja, Steliasos & Thomas, 2006). Banker and Byzalov (2014) provide a comprehensive review of the cost stickiness literature.

regulatory, legislative, or fiscal action (Berman, Wicks, Kotha, & Jones, 1999; Freeman, 1984; Hillman & Keim, 2001), attract socially conscious consumers (Hillman & Keim, 2001), or attract financial resources from socially responsible investors (Kapstein, 2001). These benefits are presumed to offset the higher costs associated with CSR, “because *resources must be allocated* to allow the firm to achieve CSR status” (Siegel & Vitaliano, 2007) (italics added).

On the one hand, Friedman (1970), describes CSR involvement as being value destroying for investors, thus predicting a negative relationship between CSR involvement and firm value. For instance, Preston and O’Bannon (1997) discuss the managerial opportunism hypothesis, and argue that managerial self-serving interests might lead to CSR overinvestment: an act detrimental to the interests of stakeholders and likely to create a competitive disadvantage, affecting firm value negatively (Benabou & Tirole, 2010).

Both these views allude to long-term CSR investment, which is as much a response to external pressure as it is to firm-level resources. The level of resources that will be devoted to CSR activities in the short-term depends mainly on the accessibility of resources not required for other purposes. From a cost behaviour perspective, it is interesting to explore the CSR cost behaviour pattern: in particular the presence or absence of cost stickiness. The theoretical perspective on cost stickiness relies on the notion that many costs, including investments on CSR-related activities, arise from managers’ deliberate resource commitment decisions, and adjustment costs associated with changing resource commitments make costs ‘sticky’ (e.g., Anderson et al., 2003). When activity levels decrease, managers may be reluctant to downsize CSR resources, e.g., contribution to charities, supporting housing and education programs and the like. By contrast, when activity levels increase, managers have to make additional investments in CSR-related activities, e.g., additional investments to minimise environmental

degradation. Therefore, to the extent that managers recognize the trade-offs arising because of adjustment costs, they will reduce CSR investments to a lesser extent when activity decreases than they will expand CSR investments when activity increases, generating cost stickiness (Anderson et al., 2003; Banker, Byzalov, & Chen, 2013). This effect is likely to be more pronounced for firms with positive CSR involvement: voluntary corporate actions designed to improve social conditions (Mackey, Mackey, & Barney, 2007); than for firms with controversial (negative) CSR involvement. The former allows firms to tap into valuable resources and to attract and retain high quality employees, among other positive factors, and the long-term investments to create and maintain these may be subject to lesser downward adjustment. However, some firms will be associated with a "...set of corporate actions that negatively affects an identifiable social stakeholder's legitimate claims in the long run" (Strike, Gao, & Bansal, 2006, p. 852). Negative CSR can be considered as a cost-saving strategy at the cost of reduced stakeholder value (Kotchen & Moon, 2012). We expect CSR costs of such firms to exhibit cost anti-stickiness behaviour, i.e., costs increase less when activity rises but decrease more when activity falls by an equivalent amount).

We use firm-level CSR scores from *Kinder, Lydenberg, Domini Research & Analytics* (KLD) database. Although KLD does not provide the actual dollar investments associated with CSR activities, KLD derive their scoring after careful evaluation of firm-level CSR activities. Waddock & Graves (1997), note that "...where possible, KLD uses quantitative criteria to determine the rating (e.g., \$ amount paid in fines or penalties; % of employees receiving certain kinds of benefits)." Kempf and Osthoff (2007) also used KLD data in exploring the effect of socially responsible investing on portfolio performance. Some other papers that use KLD data to denote environmental investment, for example, include Kim and Statman (2012), and deVilliers,

Naiker, & van Staden (2011). Firms demonstrating CSR strengths are characterised by the KLD scoring system as using innovative remediation products, providing environmental services, manufacturing products that promote the efficient use of energy, and having in place strong pollution prevention programs including both emissions reduction and toxic-use reduction programs. These activities require continued investments that are part of the firm-level operating costs (the outcome variable in the cost stickiness model).

We use two different CSR proxies and two KLD-generated scores on positive CSR activities (*CSR_STR*), as well CSR activities of concern (*CSR_CON*). We find that CSR-related investments exhibit cost stickiness, as they decrease less with a decrease in firm revenue, an effect that is primarily attributed to firm-year observations with positive CSR involvement. On the other hand, firm-year observations with negative CSR involvement exhibit cost anti-stickiness. The use of an aggregate CSR score might mask the effect of each CSR dimension on cost stickiness (Attig, Cleary, El Ghouli, & Guedhami, 2014; Galema, Plantinga, & Scholtens, 2008), since CSR is, by definition, a multidimensional construct (Carroll, 1979). Therefore, we examine cost stickiness for the components of CSR, namely: environment-related CSR, employee-related CSR, product-related CSR and, finally, community-related CSR. Consistent with our main results, we find costs to be sticky for the positive CSR involvement observations in these individual categories. However, the anti-cost-stickiness argument for these individual categories is not supported.

We contribute to extant literature in a number of important ways. First, our findings enrich the CSR literature by documenting managerial trade-offs regarding resource adjustments. To the best of our knowledge, ours is the first study to use CSR as a contextual variable affecting cost stickiness. Second, we follow recent research on CSR to theoretically and empirically

distinguish the negative aspects of CSR from the positive ones (Godfrey, Merrill, & Hansen, 2009; Kotchen & Moon, 2012; Muller & Kräussl, 2011; Strike et al., 2006), and investigate the CSR-related cost behaviour patterns on these two aspects separately. Third, we contribute to the cost stickiness literature, since costs are a fundamental determinant of earnings, and it would be useful to understand variables, like CSR, that might have an impact on cost behaviour.

The remainder of the paper proceeds as follows. Section 2 reviews the related literature and develops testable hypotheses. Section 3 explains research design issues. The following section provides our sample selection procedure and descriptive statistics. We report the main test results in Section 5. Section 6 concludes the paper.

2. Literature review and hypotheses development

CSR reflects the extent to which a firm actively responds to a host of stakeholder demands (Freeman, 1984; Hillman & Keim, 2001; Rowley & Berman, 2000) including shareholders, employees, suppliers, customers, and the broader community. CSR demands might include ensuring pollution free environments, workplace diversity and good working conditions for employees, support for education and housing, and high quality products. CSR activities are often referred to as an effective tool to obtain support from the stakeholders, ensure effective use of an organization's resources, obtain favourable coverage from the media, signal legitimacy to the community, and lessen the scrutiny from investors and employees (Orlitzky, Schmidt, & Rynes, 2003). Alexander and Buchholz (1978) suggest that stakeholders may recognise CSR activities as a management skill, and a firm perceived as having constructive CSR may face

relatively few conflicts with stakeholders, including the firm's customer base.² CSR can have a positive impact on firm performance through the provision of better access to valuable resources (Cochran & Wood, 1984; Waddock & Graves, 1997), attracting and retaining higher-quality employees (Greening & Turban, 2000; Turban & Greening, 1997), allowing for better marketing of products and services (Fombrun, 1996; Moskowitz, 1972), and contributing toward the gaining of social legitimacy.

Concerns about CSR, however, have grown considerably in last two and half decades among the business press, business and political leaders, customers, suppliers, community groups and government (McWilliams & Siegel, 2001). The dramatic growth in the number of institutes and mutual funds screening stocks on the basis of positive CSR behaviour encourages corporations to be socially responsive. To cope with the increased attention given to corporations' impact on society, more than half of the Fortune 1000 companies in the US issue CSR reports regularly, and nearly 10% of US investments are screened to ensure that they meet CSR-related criteria (Galema et al., 2008).³ Moreover, a growing number of firms worldwide have undertaken serious efforts to integrate CSR into various aspects of their businesses (Harjoto & Jo, 2011; Jo & Harjoto, 2011). According to *Sustainable and Responsible Investing (SRI) report 2014*⁴, SRI assets grew by 76 percent since the beginning of 2012 to a total \$6.57 trillion,

² We refrain from providing a comprehensive review of the voluminous literature on the determinants and consequences of CSR (see Orlitzky et al. 2003, for a comprehensive meta-analysis of the studies examining the impact of CSR on firm performance). Recent evidence suggests that firms with better CSR practices enjoy a lower cost of capital (Dhaliwal, Li, Tsang, & Yang, 2011; El Ghouli, Guedhami, Kwok, & Mishra, 2011), are prone to lower crash risk (Kim, Li, & Li 2014), and report better quality earnings (Kim, Park, & Wier, 2012) compared to firms with poor CSR practices.

³ In a recent public opinion survey on CSR (Epstein-Reeves, 2010), consumers and employees show overwhelming interest in CSR compliance. The survey show that 88% of consumers think companies should try to achieve their business goals while improving society and the environment. About 83% of employee respondents would seriously consider leaving their jobs if their employer violated labor standards and practice.

⁴ http://www.ussif.org/files/Publications/Annual_%20Report_14_FINAL.PDF

which manifests the dramatic increase in CSR investment as well as CSR-related disclosures in recent years.

Although highly desirable, CSR investments are costly, and there remain divergent views on the desirability of CSR investments. Proponents argue that CSR involvement generates a number of benefits as discussed above and inadequate engagement in CSR may endanger organization legitimacy (Kondra & Hinings, 1998; Salancik & Pfeffer, 1978). Opponents, however, argue that CSR involvement is a waste of scarce resources and hence detrimental to shareholders' interests (Friedman 1970; Preston & O'Bannon 1997; Benabou & Tirole, 2010). Despite these alternative perspectives, there appears to be a general consensus that investments in CSR are value generating in the long run. McWilliams and Siegel (2001) developed a simple theoretical model in which two firms sell identical goods, except that one company decides to add an additional CSR-targeted feature to its product expecting this feature to be valued by some consumers. This firm-based model proposes that managers conduct a cost/benefit analysis to determine the level of resources to devote to CSR activities, i.e., simultaneously assessing the demand for CSR and the cost of satisfying this demand in determining the optimal CSR investment.

Costs associated with CSR investments can be categorised into sunk costs and recurrent costs. Generally speaking, environment-related CSR activities cause costs mainly in terms of capital (e.g. new equipment, improvement of energy use etc.), but cause only minor recurrent costs (such as equipment update and maintenance). By contrast, recurrent costs of CSR activities that aim to improve the social aspects of business operations often exceed capital costs.

The theoretical perspective on cost stickiness relies on the notion that many costs, including investments on CSR-related activities, arise from managers' deliberate resource

commitment decisions, whereby adjustment costs associated with changing resource commitments in response to a decline in activity make costs ‘sticky’ (e.g., Anderson et al., 2003). When activity levels decrease, managers may be reluctant to downsize CSR resources, e.g., contribution to charities, supporting housing and education programs and the like. Another example comes from the automobile industry. A “hybrid” version of an automobile is more environment-friendly than a standard automobile and might command a price premium in the market, given the social value of reduced pollution. If the sales of hybrid automobiles goes down because of an economic crisis, management will not necessarily abandon or cut down resources to the same extent as the decline in sales, as long as the demand shock is considered to be temporary. By contrast, when activity levels increase, managers have to make additional investments on CSR-related activities, e.g., additional investments to minimize environmental degradation. Therefore, to the extent that managers recognize the tradeoffs that arise because of adjustment costs, they will reduce CSR investments to a lesser extent when activity decreases than they will expand CSR investments when activity increases, generating cost stickiness (Anderson et al., 2003; Banker et al., 2013). The following hypothesis tests this proposition:

H1: Costs-related to CSR activities are sticky in nature.

We expect the above hypothesis to be more pronounced for companies demonstrating socially responsible behaviour (positive CSR involvement). The rationale for this stems from the fact that firms that demonstrate socially responsible behaviour also invest more on CSR activities, e.g., ongoing investments in R&D for pollution reduction, investments in carbon emissions, investment in products that promote the efficient use of energy, and maintenance of property, plant, and equipment with above average environmental performance for the particular industry. All these initiatives reflect managers’ deliberate resource adjustment decisions, and

entail long-term committed costs that and cannot be adjusted downwards easily in the event of revenue shocks. Legitimacy theory would suggest that companies need to increase CSR disclosure even in periods of poor economic conditions to ensure legitimacy and ultimately survival (Karaibrahimoglu, 2008). Wilson (2008) further suggests that in order to cope with the financial and economic downturn, organisations need to focus on providing for society's needs. In the interest of their companies, particularly those operating in highly visible or socially and environmentally sensitive industries, managers may seek to rebuild confidence amongst their relevant publics. They will ensure the continued flow of resources and the upkeep of their corporate image, by disclosing more information on the social and environmental aspects of their corporate behaviour and, hence, regain legitimacy in the eyes of their stakeholders (Branco & Rodrigues, 2006 ; Cho, 2009).

On the other hand, firms that have demonstrated CSR concerns may have committed fewer resources into pro-CSR activities. For example, controversies relating to environmental contamination,⁵ water rights disputes, and plant closings might emanate from lack of adequate investment. Given the long-term benefits of CSR investments, lack of investment on pro CSR activities will affect their profitability adversely, which might require these firms to reduce costs at a faster rate than the corresponding decrease in sales. For example, a reduction in the workforce by 15% in the most recent year, or by 25% during the past two years, is considered by KLD to be an issue of CSR concern. Since workforce reduction reduces costs, this might give rise to cost anti-stickiness.

⁵ Environmental disasters, such as Exxon's oil spill in 1989 (the *Exxon Valdez* oil spill) and BP's Gulf of Mexico oil spill in 2010, illustrate that environmental issues can result in billions of dollars in cleanup costs, fines, and settlements for implicated firms. The resulting cleanup bill for the BP Gulf of Mexico spill is estimated to be more than \$40 billion.

However, recent studies have observed that both positive and negative CSR activities sometimes occur simultaneously (Fombrun et al., 2000; Muller & Kräussl, 2011; Strike et al., 2006). Tang, Qian, Chen, & Shen (2015, p.1342) observe that “A firm that engages more in socially responsible activities does not necessarily participate in fewer socially irresponsible ones, despite the fact that engagement in socially irresponsible activities is more likely to attract the attention of observers”. These two aspects of CSR are conceptually distinct and have different implications for firms (Godfrey et al., 2009; Strike et al., 2006). The positive aspect of CSR increases corporate investments and associated expenses (e.g., increased training costs; expenses on R&D for developing environment-friendly equipment), giving rise to cost stickiness. The negative CSR, on the other hand, can be considered as a cost-saving strategy at the cost of reduced stakeholder value (Kotchen & Moon, 2012), and gives rise to cost anti-stickiness, (e.g., exploitative labour practices to lower costs). Therefore, we hypothesize the following:

H2: Firms with positive CSR involvement (*CSR_STR*) will display cost stickiness, but firms with negative CSR involvement (*CSR_CON*) will exhibit cost anti-stickiness.

We also examine H2 for the CSR components, e.g., environment, community, employment, and product categories. Our choice of these four sub-categories is dictated by prior studies (e.g. Carroll, 1989; Hillman & Keim, 2001) that defined stakeholders, albeit narrowly, as primary stakeholders, individuals or entities that benefit, or are directly affected, by firms’ operations and activities. Primary stakeholders include capital suppliers (shareholders), employees, other resource suppliers, customers, community residents, and the natural environment (Clarkson, 1995). Clarkson (1995) argues that ‘the survival and continuing

profitability of the corporation depends upon its ability to fulfill its economic and social purpose, which is to create and distribute wealth or value sufficient to ensure that each primary stakeholder group continues as part of the corporation's stakeholder system' (1995, p. 107). CSR investments can be viewed as a tool for gaining and maintaining social legitimacy from these primary stakeholders, which may be jeopardized if resources devoted to CSR investments are reduced. Such a perspective suggests that costs stickiness would prevail for these CSR components targeted at maintaining a valuable relationship with primary stakeholders. Having said that, not all firms are equally responsive to all of these four categories of CSR investments. For example, firms operating in environmentally sensitive industries (e.g., automobiles, pharmaceuticals, oil & gas) would be more concerned about CSR investments in the environment, employees, and product safety categories. On the other hand, companies who do not operate in environment-sensitive industries may find a greater need to satisfy the interests of their financial stakeholders, as opposed to other stakeholders, in order to ensure continued access to financial resources and, thus, survival of their business. The following set of hypotheses are developed:

H2A: CSR components will exhibit cost stickiness.

H2B: Cost stickiness from CSR investments will be more pronounced for firm-year observations with positive CSR involvement. On the other hand, costs will be anti-sticky for negative CSR involvement observations.

H2C: Cost stickiness among CSR components will vary across environment-sensitive versus other industries.

3. Research design

3.1 Measurement of CSR

We use information from one of the most widely adopted CSR scoring standards, that is, the *Kinder, Lydenberg, and Domini Research & Analytics, Inc.* (hereby KLD). KLD compiles annual ratings of over 3,000 publicly traded U.S. firms, including Standard and Poor (S&P) 500 firms and 150 firms from the Domini Social Index. KLD rates companies on a wide range of activities that reflect how well companies perform in social responsibility and in building relationships with various stakeholders. KLD captures over 94 measurement items along seven social dimensions: community, diversity, employee relations, environment, corporate governance, human rights, and product safety. For each measure, KLD offers “strength” and “concern” (e.g., Waddock & Graves, 1997; Waldman, Siegel, & Javidan, 2006) for each firm year. A drawback of this measure is that it weights all strengths and concerns, as well as each social dimension, equally.⁶ Following prior studies (Attig et al., 2014; Kim et al., 2014), we exclude the corporate governance dimension from our CSR score because it is distinct from the other social and environmental dimensions. We calculate a net score for each of the remaining six dimensions of CSR as the number of strengths minus the number of concerns. Thus, our primary dependent variable, *CSR_NET*, is the sum of the net score from each of the six CSR dimensions. To shed further light on the individual components of CSR (Attig et al., 2014; El Ghoul et al., 2011), we choose four individual CSR dimensions: Environment (*ENV_NET*);

⁶ In an early work on the construct validity of the KLD database, Sharfman (1996) documents a positive correlation ranging from a low of 0.18 to a high of 0.55 between the KLD ratings and other available CSR measures (e.g., Fortune corporate reputation survey). Chatterji, Levine, & Toffel (2009) find the KLD “concern” ratings to be fairly good summaries of past environmental performance. In addition, firms with more KLD concerns appear to be involved in more pollution and regulatory compliance violations in subsequent years. KLD environmental strengths, in contrast, fail to perform satisfactorily on both dimensions for those firms.

Employee Relations (*EMP_NET*); Product Characteristics (*PROD_NET*); and Community (*COM_NET*), the rationale for which has been explained in Section 2.

3.2 Measurement of sticky costs

The following model proposed by Anderson et al. (2003) is used to capture asymmetric cost behaviour:

$$\ln \frac{OC_t}{OC_{t-1}} = \gamma_0 + \gamma_1 \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_2 Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \varepsilon \dots \dots \dots (1)$$

where *OC* is operating costs. We use two versions of *OC*. *OC1* is operating costs defined as sales revenue minus income before extraordinary items. *OC2* is defined as sales revenue minus operating income after depreciation for firm *i* in year *t*. Given the qualitatively similar results, we report results based on *OC1* only. *Decrease_dum_t* takes the value of one when sales revenues in year *t* are less than those in year *t-1* and zero otherwise. Coefficient γ_1 measures the percentage increase in *OC* costs with a 1 percent increase in sales revenue. The sum of the coefficient ($\gamma_1 + \gamma_2$) measures the percentage decrease in *OC*, with a 1 percent decrease in sales revenue. A significantly positive coefficient on γ_1 and a significantly negative coefficient on γ_2 would confirm cost stickiness.

3.3 Empirical model

We estimate the following comprehensive model that incorporates cost stickiness, CSR effects on cost stickiness, and other determinants unrelated to CSR on cost stickiness (Anderson et al., 2003; Chen, Lu, & Sougiannis, 2012).

$$\ln \frac{OC_t}{OC_{t-1}} = \gamma_0 + \gamma_1 \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_2 Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_3 CSR_t + \gamma_4 CSR_t * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_5 CSR_t * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \sum_{n=6}^{10} \gamma_n Econ_Var_{n,t} + \sum_{m=11}^{15} \gamma_m Econ_Var * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \varepsilon \dots \dots (2)$$

In the above regression the coefficient on γ_2 is our proxy for cost stickiness; CSR is our main variable of interest. We use four different specifications of CSR, net CSR (*CSR_NET*), industry-adjusted CSR (*CSR_IND*); CSR strengths (*CSR_STR*), and CSR concerns (*CSR_CON*). We also use CSR components, namely, environment, employees, product, community-related CSR, and strengths and concerns pertinent to these respective categories. *ECON_VAR* are economic variables, and include: asset intensity (*ASST_INTEN*) measured as total assets divided by sales revenue for year t; employee intensity (*EMP*) measured as the natural logarithm of number of employees; successive decrease (*SUC_DEC*) which is an indicator variable that is equal to 1 if revenue in year t-1 is less than revenue in t-2, and 0 otherwise; stock performance (*RETURN*) measured as the raw stock return (from Center for Research in Security Prices (CRSP); and free cash flow (*FCF*) measured as cash flow from operating activities less common and preferred dividends, scaled by total assets. All these standalone economic variables are interacted with γ_2 .

4. Sample selection and descriptive statistics

We began with an initial sample of 40,518 firm-year observations from 1991 to 2013 available on the KLD database. We matched this data with COMPUSTAT and lost 4,033 firm-year observations. We then excluded 9,203 firm-year observations pertaining to utility (2-digit SIC codes 48 & 49) and financial institutions (2-digit SIC codes 60-69), as is consistent with prior

literature. Finally, we lost another 5,325 firm-year observations because of missing values for the regression variables. Our final sample for conducting the regressions is 21,957 firm-year observations.

Panel A, Table 1 provides descriptive statistics for the variables used for regression analyses. The mean (median) of the log of both the operating cost and the revenue ratio is 0.09 (0.08). The average *CSR_NET* is -0.03 with a large standard deviation, although the overall median is zero, suggesting a relatively balanced distribution of firms with negative and positive CSR performance. *CSR_STR* is lower than *CSR_CON* (an average of 1.31 and 1.60 respectively). However, firm-year observations with *CSR_STR*>*CSR_CON* are more profitable (*ROA* of 0.09 versus 0.05, t-stat 9.84, p<0.001); and larger (log of *MVE* is 7.93 versus 7.10, t-stat 34.00, p<0.001), two key determinants for CSR investments. Average CSR components range from a low of -0.02 (*EMP_NET*) to a high of 0.11 (*COM_NET*). Sample firms use \$1.33 million (median = 0.71) of assets to support each million dollars in sales revenue. The median firm has not experienced two consecutive years of sales decreases in the past two years (median = 0.00, mean = 0.24), and the average raw stock return in the year is 0.19 (median = 0.12). On average, free cash flow accounts for 9 percent of total assets (median = 9 percent) for our sample firms. Firm-year observations come from a wide variety of industries with two digit SIC codes 35-39 and 70-79 commanding the largest industry representation in our sample, as is evident from Panel B.

[TABLE 1 ABOUT HERE]

5. Multiple regression results

5.1 CSR involvement and cost stickiness

Table 2 presents regression results for the effect of CSR investments on cost stickiness. We estimate the asymmetrical adjustment of operating costs at the firm level with firm-clustered standard errors (Petersen, 2009; Gow, Ormazabal & Taylor, 2010). Industry and year dummies are included in all our regression models. Our baseline regression in model (1) shows that the coefficient on γ_1 is 0.84 (t =54.12). This indicates that operating costs increase by about 0.84 percent for 1 percent increase in sales revenue. The estimated value of γ_2 is -0.05 (t=-1.67). The combined value of $\gamma_1 + \gamma_2 = 0.79$ indicates that operating costs decrease by about 0.79 percent per 1 percent decrease in sales revenue, reflecting cost stickiness. Our reported coefficients vary significantly from Anderson et al. (2001) probably because of our use of operating income before extraordinary items instead of SG&A as the cost measure and our use of a different sample period than Anderson et al. (2001).

We expand model (1) by incorporating CSR variables into the regression and an interactive variable, γ_5 , $CSR_t * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$. We should expect a negative and significant coefficient on the interactive variable γ_5 to support our hypothesis that CSR-related investments generate cost stickiness. We find support for our prediction, as the coefficient on γ_5 is negative and significant in Model (1) (coefficient -0.037, t-stat -3.77, p<0.001). We document a similar finding when we use CSR_IND as an alternative CSR proxy (coefficient -0.20, t-stat -1.83, p<0.10). Models (4) and (5) report results for equation (2) for the positive CSR (CSR_STR) and negative CSR (CSR_CON) sub-categories. We hypothesized in H2 that cost stickiness would be more pronounced for CSR_STR observations, and find support for

our hypothesis. The coefficient on γ_5 is negative and significant for *CSR_STR* (coefficient -0.032, t-stat -3.01). We hypothesized an anti-stickiness pattern for *CSR_CON* observations, suggesting a more than proportionate decrease in costs with a decrease in revenues. This would result in a positive and significant coefficient on γ_5 for *CSR_CON* observations, as is evident in Model (5) (coefficient 0.024, t-stat 2.46, $p < 0.05$).

With respect to the economic determinants of cost stickiness we observe a significantly negative coefficient on *ASSTINT** γ_2 , implying a greater degree of cost stickiness for firms that require relatively more assets to support their operations. The coefficient on *SUC_DEC** γ_2 is significantly positive, suggesting a lower degree of operating cost asymmetry in firms experiencing negative demand shocks in two consecutive years. However, unlike Anderson et al. (2003), we find a significantly positive coefficient on employee intensity *EMP** γ_2 , suggesting a lower degree of cost asymmetry in firms that require relatively more employees to support operations. This finding is consistent with Chen et al. (2012).⁷ The positive coefficient on the interactive variable *FCF** γ_2 is inconsistent with the agency theory argument, which proposes that cost stickiness will be greater because managers with free cash flows tend to invest in negative NPVs with the intention of empire building (Chen et al. 2012). Such inefficient investments increase operating costs but, with a decline in sales demand, managers do not make downward resource adjustments, giving rise to asymmetric cost behaviour. The coefficient on *RET** γ_2 is insignificant. The explanatory power of the four models ranges from 56% to 59%.⁸

[TABLE 2 ABOUT HERE]

⁷ See footnote 7 in Chen et al. (2012) for a likely explanation of the inconsistent findings.

⁸ Our results remain qualitatively similar if we use operating income after depreciation as our operating costs measure. Untabulated results show that the coefficients on *CSR_NET* is -0.027 (t-stat -3.14), *CSR_IND* is -0.18 (t-stat -1.79) and that on *CSR_STR* is -0.03 (t-stat -2.96) respectively.

Table 2 provides aggregated results on the cost stickiness pattern of CSR involvement. However, KLD provides finer data on CSR strengths and concerns across six CSR categories, namely, community, diversity, employee, environment, human rights, and product characteristics. Appendix 1 provides a brief summary of the CSR strengths and concerns retrieved from the KLD database. We choose four of these six CSR dimensions that target primary stakeholders, environment (*CSR_ENV*), employee relations (*CSR_EMP*), product characteristics (*CSR_PRO*), and community-related CSR (*CSR_COM*).

Table 3 presents regression results. The coefficient on γ_5 is negative and significant for both the *CSR_ENV* (coefficient -0.043, t-stat -1.98, $p < 0.05$) and *CSR_EMP* (coefficient -0.057, t-stat -2.25, $p < 0.05$) categories. Negative and significant coefficients are also evident for the *CSR_STR* dimension for these categories (models 2 and 5), supporting cost stickiness among CSR components. The coefficients on *CSR_CON*, however, are insignificant and, hence, do not support the cost anti-stickiness argument. We perform similar analyses for the *CSR_PRO*, and *CSR_COM*, dimensions. The interactive coefficients on *CSR_COM* and *CSR_COM_STR* are both negative and significant, as is consistent with our hypothesis (coefficients of -0.11 and -0.10, $p < 0.01$ and $p < 0.05$ respectively). For the *CSR_PRO* category, the interactive coefficient is negative but insignificant (coefficient -0.036, t-stat -1.35), although negative and significant for the *PRO_STR* category (coefficient -0.23, t-stat -4.12, $p < 0.01$). Taken together, the empirical analyses in Panel A, Table 3 provide general support for H2A and H2B.

Panel B, Table 3 also presents the regression results for CSR components and cost stickiness but for two broad groups of industries: environmentally sensitive industries, and other industries. Not all firms are equally responsive to the four categories of CSR investments. Firms operating in environmentally sensitive industries would be more concerned about CSR

investments in the environment, employee, and product safety categories, because of greater stakeholder, including government, scrutiny emanating from the risks posed by these industries to the external environment. On the other hand, companies that do not operate in environment-sensitive industries may find a greater need to satisfy the interests of their financial stakeholders as opposed to other stakeholders in order to ensure continued access to financial resources and, thus, survival of their business.

We find support for H2C, as firms operating in environmentally sensitive industries exhibit greater cost stickiness compared to firms operating in non-sensitive industries. Coefficients are negative and significant for three of the four CSR categories, namely *CSR_ENV* (coefficient -0.04, $p < 0.01$), *CSR_EMP* (coefficient -0.07, $p < 0.05$), and *CSR_COM* (coefficient -0.12, $p < 0.01$). For firm-year observations operating in other industries, the coefficient on the interactive variable is negative and marginally significant for only the *CSR_EMP* component (coefficient -0.07, $p < 0.10$). For the *CSR_STR* category, we find the coefficient to be negative and significant across all four CSR components for firms operating in the environmentally sensitive industries. The evidence, therefore, suggests that firms operating in the sensitive industries are more pro-active in their CSR investments as a tool for legitimizing their operations.

[TABLE 3 ABOUT HERE]

5.3 Additional analysis

(a) Non-zero CSR observations

Our main analysis is based on a sample that includes missing CSR data (coded as zero in the database). We rerun our main regression (equation 2) retaining only non-zero CSR observations. Untabulated results provided results qualitatively similar to those in the main

analysis. For example, the coefficient on the interactive variable for *CSR_NET* is -0.036 (t-stat -3.71, $p < 0.001$) and for *CSR_STR* is -0.036 (t-stat -3.17, $p < 0.001$).

(b) Fixed-effects regression

Untabulated results reveal the coefficient on *CSR_NET** γ_2 to be -0.03 (t-stat -4.20, $p < 0.001$). For *CSR_STR* the coefficient is -0.03 (t-stat -2.87, $p < 0.001$) while that on *CSR_CON* is insignificant. For CSR categories, the coefficient on *CSR_ENV* is -0.03 (t-stat -1.53); for *CSR_EMP* it is -0.04 (t-stat -1.88); for *CSR_COM* it is -0.12 (t-stat -3.29); and *CSR_PRO* it is -0.04 (t-stat -1.42).

(c) Decile ranking of CSR and cost stickiness

A potential concern relating to the KLD database is that KLD has been adding and deleting item ratings over time. For instance, reporting on South African CSR strengths and concerns in the area of qualitative human rights was stopped in 1995, while labour rights strengths in the same area were added in 2002, and a volunteer program, pertaining to a community strength, was added in 2005. As a result, the CSR scores may not be comparable over time. To address this concern, we transform the respective CSR issues area scores and the *CSR_NET* score into decile ranks for each year. A higher value of this decile rank indicates higher level of CSR performance. Regression results using decile rank of CSR corroborate our earlier findings. More clearly, we find that the coefficient on *CSR_DECILE** γ_2 to be negative and significant (coefficient -0.018, t-stat -2.03, $p < 0.05$). For the *CSR_STR* category the coefficient is -0.017 with an associated t-stat of -2.45 ($p < 0.05$).

(d) Alternative costs measure and cost stickiness

In our main analysis, we used operating costs as our cost proxy. We run a sensitivity test using SG&A as our costs proxy, consistent with bulk of the empirical literature on cost stickiness. Results are reported in Table 4. As is evident from the table, results are largely consistent with the main results. For example, the coefficient on the interactive variable is -0.032 (t-stat -3.12) using SG&A, while it is -0.037 (t-stat -3.77) for the operating cost model.

[TABLE 4 ABOUT HERE]

6. Conclusion

This paper explores the cost behaviour of CSR activities, and investigates whether firm's CSR involvement gives rise to cost stickiness. Since CSR involvement is long term in nature and firms engage in CSR activities to satisfy diverse stakeholders, we argue that managers may be reluctant to downsize CSR investment, even when activity levels decrease. On the other hand, when activity levels increase, managers have to make additional investments on CSR-related activities. Thus, owing to the fact that managers expand CSR investments when activity increases, but are less likely to reduce CSR investments when activity decreases, CSR investment is likely to be more sticky. Using two proxies for CSR, we show that CSR-related costs exhibit cost stickiness, because they decrease less with a decrease in firm revenue. We decompose the CSR scores into CSR strengths and CSR concerns and find that cost stickiness is more pronounced for the positive aspect of CSR involvement. However, the negative aspect of CSR exhibits anti-cost stickiness. Considering that the aggregate CSR score might mask the effect of individual aspects of the CSR dimension on cost stickiness, we further examine cost stickiness for individual aspects of CSR. Consistent with our main results, we find that positive

CSR involvement for each these individual categories of CSR demonstrates cost stickiness behaviour.

We contribute to the extant cost stickiness and CSR literature by documenting the sticky cost behaviour of CSR related investment. While prior literature focuses on economic and agency explanations for the cross-sectional variation in the degree of cost stickiness, ours is the first to provide evidence of firm-level CSR involvement as another source of cost stickiness. We also enrich the CSR literature that stresses the trends in CSR performance. Our results reveal that firms do not reduce their investment in CSR, even when their activity levels decrease.

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TABLE 1: Descriptive statistics, industry distribution, and correlation results
PANEL A: Descriptive statistics

Variables	Mean	SD	1 st qrt	Median	3 rd quartile
$\ln [OC_t/OC_{t-1}]$	0.09	0.24	0.00	0.08	0.18
$\ln [Revenue_t/Revenue_{t-1}]$	0.09	0.21	0.00	0.08	0.18
<i>DEC_DUM</i>	0.25	0.43	0.00	0.00	0.00
<i>CSR_NET</i>	-0.03	2.41	-1.00	0.00	1.00
<i>CSR_IND</i>	0.39	0.25	0.20	0.33	0.55
<i>CSR_STR</i>	1.31	2.04	0.00	1.00	2.00
<i>CSR_CON</i>	1.60	1.50	1.00	1.00	2.00
<i>CSR_ENV_NET</i>	0.03	0.81	0.00	0.00	0.00
<i>CSR_EMP_NET</i>	-0.02	0.99	0.00	0.00	0.00
<i>CSR_COM_NET</i>	0.11	0.52	0.00	0.00	0.00
<i>CSR_PRO_NET</i>	-0.10	0.59	0.00	0.00	0.00
<i>ASST_INTEN</i>	1.33	1.10	0.71	1.05	1.59
<i>EMP</i>	8.38	1.73	7.16	8.39	9.54
<i>SUC_DEC</i>	0.24	0.42	0.00	0.00	0.00
<i>RETURN</i>	0.19	0.55	-0.12	0.12	0.40
<i>FCF</i>	0.09	0.08	0.05	0.09	0.13

Note: Operating costs (OC) are defined as sales minus income before extraordinary items. *DEC_DUM* takes the value of one when sales revenues in year t are less than those in year t-1 and zero otherwise. *CSR_NET*: The net CSR score is estimated as the total strengths minus total concerns across the main six social rating areas: community, diversity, employee relations, environment, human rights, and product. *CSR_IND* is the industry-level CSR score that ranges from zero to one and is calculated using the formula below:

$$CSR_IND_{i,t} = \frac{CSR_NET_{i,t} - MIN._CSR_NET_{j,t}}{MAX._CSR_NET_{j,t} - MIN._CSR_NET_{j,t}}$$

Where, i, j, t denote firm i, industry j (two digit SIC codes) and year t, respectively. Moreover, MIN. and MAX. refer to the minimum and maximum *CSR_NET* for firm i's industry in year t, respectively. *CSR_STR*: The CSR total strength score, estimated as the sum of the strength score from the community, diversity, employee, environment, human rights, and product characteristics qualitative issues. *CSR_CON*: The CSR total concern score, estimated as the sum of the concern score from the community, diversity, employee, environment, human rights, and product characteristics qualitative issues. *CSR_ENV_NET*: The net CSR environment component score estimated as the total strengths minus total concerns for the environment category. *CSR_EMP_NET*: The net CSR employee component score estimated as the total strengths minus total concerns for the employee category. *CSR_COM_NET*: The net CSR community component score estimated as the total strengths minus total concerns for the community category. *CSR_PRO_NET*: The net CSR product component score estimated as the total strengths minus total concerns for the product category. Asset intensity (*ASST_INTEN*) is total assets divided by sales revenue for year t; employee intensity (*EMP*) is the natural logarithm of number of employees; successive decrease (*SUC_DEC*), is an indicator variable that is equal to 1 if revenue in year t-1 is less than revenue in t-2, and 0 otherwise; stock performance (*RETURN*) is the raw stock return (from CRSP); and free cash flow (*FCF*) is measured as cash flow from operating activities less Common and preferred dividends scaled by total assets.

PANEL B: Industry distribution

Code	Industry	Observations	% observations
1-14	Agriculture & mining	1,397	0.06
15-17	Building construction	331	0.02
20-21	Food & kindred products	844	0.04
22-23	Textile mill products & apparels	349	0.02
24-27	Lumber, furniture, paper, and printing	1,177	0.05
28-30	Chemical, petroleum, and rubber & allied products	2,373	0.11
31-34	Metal	986	0.04
35-39	Machinery, electrical, computer equipment	6,454	0.29
40-49	Railroad and other transportation & utilities	1,180	0.05
50-51	Wholesale goods, building materials	841	0.04
53-59	Store merchandise, auto dealers, home furniture stores	2,168	0.10
70-79	Business services	3,212	0.15
80-99	Others	645	0.03
	Total	21,957	1.00

TABLE 2: Regression results

$$\ln \frac{OC_t}{OC_{t-1}} = \gamma_0 + \gamma_1 \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_2 Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_3 CSR_t + \gamma_4 CSR_t * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_5 CSR_t * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \sum_{n=6}^{10} \gamma_n Econ_Var_{n,t} + \sum_{m=11}^{15} \gamma_m Econ_Var * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \varepsilon \dots \dots (2)$$

		<i>Model (1)</i>	<i>Model (2)</i>	<i>Model (3)</i>	<i>Model (4)</i>	<i>Model (5)</i>
<i>Variables</i>	<i>Predicted sign</i>	<i>Baseline</i>	<i>CSR_NET</i>	<i>CSR_IND</i>	<i>CSR_STR</i>	<i>CSR_CON</i>
$\gamma_1: \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	+	0.84***	0.871***	0.815***	0.838***	0.873***
		[54.12]	[56.96]	[26.51]	[43.13]	[42.45]
$\gamma_2: Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	-	-0.05*	-0.071	0.021	-0.023	-0.091*
		[-1.67]	[-1.43]	[0.33]	[-0.45]	[-1.68]
$\gamma_3: CSR$?		-0.003***	-0.019**	-0.004***	-0.001
			[-4.01]	[-2.38]	[-5.56]	[-0.71]
$\gamma_4: CSR * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$?		0.020***	0.130**	0.028***	-0.006
			[3.17]	[1.98]	[4.47]	[-0.57]
$\gamma_5: CSR * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	-		-0.037***	-0.202*	-0.032***	0.024***
			[-3.77]	[-1.83]	[-3.01]	[2.46]
<i>ASSTINT</i>			0.006**	0.006**	0.006**	0.006**
			[2.30]	[2.35]	[2.51]	[2.41]
<i>ASSTINT* γ2</i>	-		-0.024*	-0.023*	-0.023*	-0.022*
			[-1.76]	[-1.73]	[-1.74]	[-1.66]
<i>EMP</i>			0.001*	0.001*	0.002***	0.002**
			[1.74]	[1.81]	[2.66]	[2.51]
<i>EMP* γ2</i>	-		0.060***	0.062***	0.060***	0.066***
			[6.02]	[6.32]	[5.73]	[6.12]

		<i>Model (1)</i>	<i>Model (2)</i>	<i>Model (3)</i>	<i>Model (4)</i>	<i>Model (5)</i>
Variables	<i>Predicted sign</i>	<i>Baseline</i>	<i>CSR_NET</i>	<i>CSR_IND</i>	<i>CSR_STR</i>	<i>CSR_CON</i>
<i>SUCDEC</i>			-0.034***	-0.034***	-0.033***	-0.033***
			[-11.84]	[-12.03]	[-11.77]	[-11.84]
<i>SUCDEC</i> * γ_2	+		0.160***	0.164***	0.163***	0.164***
			[5.02]	[5.11]	[5.11]	[5.07]
<i>RET</i>			-0.023***	-0.023***	-0.023***	-0.022***
			[-8.29]	[-8.11]	[-8.26]	[-8.07]
<i>RET</i> * γ_2	?		0.005	0.008	0.006	0.006
			[0.27]	[0.39]	[0.29]	[0.31]
<i>FCF</i>			0.125***	0.130***	0.129***	0.129***
			[7.02]	[7.24]	[7.17]	[7.12]
<i>FCF</i> * γ_2	-		0.288*	0.326**	0.296*	0.293*
			[1.87]	[2.05]	[1.92]	[1.90]
Constant		0.009	0.005	0.016	0.004	0.007
		[1.53]	[0.35]	[0.97]	[0.24]	[0.46]
Industry FE		YES	YES	YES	YES	YES
Year FE		YES	YES	YES	YES	YES
Observations		21,957	21,957	21,957	21,957	21,957
Adj. R ²		0.56	0.56	0.58	0.59	0.58

Note: Robust t-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.10. Variable definitions are in Table 1.

TABLE 3
PANEL A: CSR component scores and cost stickiness

$$\ln \frac{OC_t}{OC_{t-1}} = \gamma_0 + \gamma_1 \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_2 Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_3 CSR_t + \gamma_4 CSR_t * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_5 CSR_t * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \sum_{n=6}^{10} \gamma_n Econ_Var_{n,t} + \sum_{m=11}^{15} \gamma_m Econ_Var * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \varepsilon \dots \dots (2)$$

		<i>Model (1)</i>	<i>Model (2)</i>	<i>Model (3)</i>	<i>Model (4)</i>	<i>Model (5)</i>	<i>Model (6)</i>
Variables	<i>Sign</i>	<i>CSR_ENV</i>	<i>CSR_ENV_STR</i>	<i>CSR_ENV_CON</i>	<i>CSR_EMP</i>	<i>CSR_EMP_STR</i>	<i>CSR_EMP_CON</i>
$\gamma_1: \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	+	0.863***	0.861***	0.860***	0.865***	0.855***	0.867***
		[52.72]	[49.58]	[50.32]	[53.33]	[48.74]	[50.11]
$\gamma_2: Dec_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	-	-0.057	-0.055	-0.059	-0.061	-0.043	-0.069
		[-1.15]	[-1.10]	[-1.19]	[-1.21]	[-0.86]	[-1.36]
$\gamma_3: CSR$?	-0.001	-0.004**	-0.002	-0.002	-0.006***	-0.006**
		[-0.83]	[-2.04]	[-1.21]	[-1.20]	[-3.18]	[-2.13]
$\gamma_4: CSR * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	+	-0.005	0.019	0.025	0.028*	0.036**	-0.008
		[-0.40]	[1.13]	[1.58]	[1.72]	[2.16]	[-0.34]
$\gamma_5: CSR * Dec_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	-	-0.043**	-0.044*	0.011	-0.057**	-0.072**	0.019
		[-1.98]	[-1.84]	[0.42]	[-2.24]	[-2.45]	[0.55]
<i>Economic determinants</i>		<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
<i>Economic determinants * γ_2</i>		<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
Industry FE		<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
Year FE		<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
Observations		21,957	21,957	21,957	21,957	21,957	21,957
Adj. R-squared		0.58	0.59	0.59	0.58	0.58	0.58

TABLE 3
CSR component scores and cost stickiness (Contd.)

	Model (7)	Model (8)	Model (9)	Model (10)	Model (11)	Model (12)
Variables	<i>CSR_PRO</i>	<i>CSR_PRO_STR</i>	<i>CSR_PRO_CON</i>	<i>CSR_COM</i>	<i>CSR_COM_STR</i>	<i>CSR_COM_CON</i>
$\gamma_1: \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	0.864***	0.858***	0.859***	0.861***	0.856***	0.863***
	[52.70]	[50.74]	[50.19]	[51.93]	[50.76]	[52.31]
$\gamma_2: Dec_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	-0.064	-0.050	-0.057	-0.052	-0.050	-0.061
	[-1.29]	[-1.01]	[-1.13]	[-1.03]	[-1.00]	[-1.23]
$\gamma_3: CSR$	0.001	-0.014***	-0.006***	-0.007***	-0.009***	-0.006
	[0.67]	[-4.24]	[-2.89]	[-3.11]	[-4.40]	[-0.93]
$\gamma_4: CSR * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	-0.006	0.116***	0.050***	0.067***	0.090***	0.016
	[-0.38]	[3.75]	[2.60]	[3.07]	[5.22]	[0.29]
$\gamma_5: CSR * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	-0.036	-0.229***	-0.031	-0.107***	-0.097**	0.042
	[-1.35]	[-4.12]	[-1.05]	[-2.86]	[-2.21]	[0.46]
<i>Economic determinants</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
<i>Economic determinants</i> * γ_2	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
Industry FE	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
Year FE	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
Observations	21,957	21,957	21,957	21,957	21,957	21,957
Adj. R-squared	0.58	0.42	0.54	0.58	0.59	0.58

Note: Robust t-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.10. Variable definitions are in Table 1.

PANEL B: CSR component scores and cost stickiness for environmentally sensitive and other industries

	Environmentally sensitive industries				Other industries			
Variables	<i>CSR_ENV</i>	<i>CSR_EMP</i>	<i>CSR_PRO</i>	<i>CSR_COM</i>	<i>CSR_ENV</i>	<i>CSR_EMP</i>	<i>CSR_PRO</i>	<i>CSR_COM</i>
$\gamma_5: CSR * \gamma_2$	-0.04***	-0.07**	-0.03	-0.12***	-0.06	-0.07*	-0.05	0.03
	[-3.54]	[-2.19]	[-0.93]	[-2.87]	[-0.98]	[-1.91]	[-1.09]	[0.27]
<i>Main variable and interaction with CSR</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Economic determinants</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Economic determinants*γ_2</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,730	14,730	14,730	14,730	7,119	7,119	7,119	7,119
Adj. R-squared	0.57	0.57	0.57	0.57	0.66	0.66	0.66	0.66

	Environmentally sensitive industries				Other industries			
Variables	<i>ENV_STR</i>	<i>EMP_STR</i>	<i>PRO_STR</i>	<i>COM_STR</i>	<i>ENV_STR</i>	<i>EMP_STR</i>	<i>PRO_STR</i>	<i>COM_STR</i>
$\gamma_5: CSR * \gamma_2$	-0.07**	-0.08**	-0.25***	-0.14***	0.07	-0.07	-0.17	0.03
	[-2.03]	[-2.25]	[-4.06]	[-3.93]	[0.99]	[-1.68]	[-1.27]	[0.28]
<i>Main variable and interaction with CSR</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Economic determinants</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Economic determinants*γ_2</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,730	14,730	14,730	14,730	7,119	7,119	7,119	7,119
Adj. R-squared	0.57	0.57	0.57	0.57	0.66	0.66	0.66	0.66

Note: Environmentally sensitive industries as well industries not environment-sensitive are identified using the North American Industrial Classification System (NAICS) coding procedure. Robust t-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.10. Variable definitions are in Table 1.

Table 4: Alternative costs measure and cost stickiness

$$\ln \frac{SG \& A_t}{SG \& A_{t-1}} = \gamma_0 + \gamma_1 \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_2 Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_3 CSR_t + \gamma_4 CSR_t * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \gamma_5 CSR_t * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \sum_{n=6}^{10} \gamma_n Econ_Var_{n,t} + \sum_{m=11}^{15} \gamma_m Econ_Var * Decrease_dum * \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right] + \varepsilon \dots \dots (2)$$

Variables	<i>Components are based on CSR_STR</i>					
	<i>CSR_NET</i>	<i>CSR_STR</i>	<i>CSR_ENV</i>	<i>CSR_EMP</i>	<i>CSR_PRO</i>	<i>CSR_COM</i>
$\gamma_1: \ln \left[\frac{Revenue_t}{Revenue_{t-1}} \right]$	0.615***	0.572***	0.599***	0.592***	0.591***	0.594***
	[39.83]	[33.17]	[96.40]	[35.39]	[36.79]	[37.43]
γ_2	-0.250***	-0.204***	-0.237***	-0.216***	-0.226***	-0.230***
	[-6.15]	[-4.79]	[-11.32]	[-5.11]	[-5.48]	[-5.60]
$\gamma_3: CSR$	-0.004***	-0.005***	-0.006***	-0.006***	-0.024***	-0.014***
	[-5.01]	[-5.91]	[-3.01]	[-3.42]	[-6.09]	[-3.30]
$\gamma_4: CSR * \gamma_1$	0.032***	0.032***	0.016	0.042**	0.195***	0.097**
	[4.80]	[3.97]	[1.53]	[2.28]	[5.34]	[2.33]
$\gamma_5: CSR * \gamma_2$	-0.032***	-0.039***	-0.040**	-0.104***	-0.303***	-0.080
	[-3.12]	[-2.72]	[-2.03]	[-3.35]	[-4.28]	[-0.94]
<i>Economic determinants</i>	YES	YES	YES	YES	YES	YES
<i>Economic determinants * γ_2</i>	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	21,957	21,957	21,957	21,957	21,957	21,957
Adj. R-squared	0.49	0.49	0.49	0.49	0.49	0.49

Note: Robust t-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.10. Variable definitions are in Table 1.

Appendix: KLD description of CSR strengths and concerns across CSR categories

<p>COMMUNITY STRENGTHS:</p> <ul style="list-style-type: none"> • Charitable Giving: The company has consistently given over 1.5% of trailing three-year net earnings before taxes (NEBT) to charity. The company has a notably innovative giving program that supports non-profit organizations. • Support for Housing: The company is a prominent participant in public/private partnerships that support housing initiatives for the economically disadvantaged, e.g., the National Equity Fund or the Enterprise Foundation. • Support for Education: The company has either been notably innovative in its support for primary or secondary school education, or the company has prominently supported job-training programs for youth. • Non-US Charitable Giving: The company has made a substantial effort to make charitable contributions abroad, as well as in the U.S. To qualify, a company must make at least 20% of its giving, or have taken notably innovative initiatives in its giving program, outside the U.S. 	<p>COMMUNITY CONCERNS:</p> <ul style="list-style-type: none"> • Investment Controversies: The company is a financial institution whose lending or investment practices have led to controversies. • Negative Economic Impact: The company's actions have resulted in major controversies concerning its economic impact on the community. These controversies can include issues related to environmental contamination, water rights disputes, and plant closings. • Disputes: The company has recently been involved in major tax disputes involving Federal, state, local or non-U.S. government authorities, or is involved in controversies over its tax obligations to the community.
<p>EMPLOYEE RELATIONS STRENGTHS:</p> <ul style="list-style-type: none"> • Cash Profit Sharing: The company has a cash profit-sharing program through which it has recently made distributions to a majority of its workforce. • Employee Involvement: The company strongly encourages worker involvement and/or ownership through stock options available to a majority of its employees, gain sharing, stock ownership, sharing of financial information, or participation in management decision-making. • Health and Safety Strength: The company is noted by the US Occupational Health and Safety Administration for its safety programs. 	<p>EMPLOYEE RELATIONS CONCERNS:</p> <ul style="list-style-type: none"> • Health and Safety Concern: The company recently has either paid substantial fines or civil penalties for wilful violations of employee health and safety standards, or has been otherwise involved in major health and safety controversies. • Workforce Reductions: The company has reduced its workforce by 15% in the most recent year or by 25% during the past two years, or it has announced plans for such reductions. • Retirement Benefits Concern: The company has either a substantially underfunded defined benefit pension plan, or an inadequate retirement benefits program.
<p>ENVIRONMENTAL STRENGTHS:</p> <ul style="list-style-type: none"> • Beneficial Products and Services: The company derives substantial revenues from innovative remediation products, environmental services, or products that promote the efficient 	<p>ENVIRONMENTAL CONCERNS:</p> <ul style="list-style-type: none"> • Hazardous Waste: The company's liabilities for hazardous waste sites exceed \$50 million, or the company has recently paid substantial fines or civil penalties for waste management violations.

<p>use of energy, or it has developed innovative products with environmental benefits.</p> <ul style="list-style-type: none"> • Pollution Prevention: The company has notably strong pollution prevention programs including both emissions reductions and toxic-use reduction programs. • Recycling: The company either is a substantial user of recycled materials as raw materials in its manufacturing processes, or a major factor in the recycling industry. • Clean Energy: The company has taken significant measures to reduce its impact on climate change and air pollution through use of renewable energy and clean fuels or through energy efficiency. • Property, Plant, and Equipment: The company maintains its property, plant, and equipment with above average environmental performance for its industry. 	<ul style="list-style-type: none"> • Regulatory Problems: The company has recently paid substantial fines or civil penalties for violations of air, water, or other environmental regulations. • Ozone Depleting Chemicals: The company is among the top manufacturers of ozone depleting chemicals. The company's legal emissions of toxic chemicals from individual plants into the air and water are among the highest of the companies followed by KLD. • Climate Change: The company derives substantial revenues from the sale of coal or oil and its derivative fuel products, or the company derives substantial revenues indirectly from the combustion of coal or oil and its derivative fuel products.
<p>PRODUCT STRENGTHS:</p> <ul style="list-style-type: none"> • Quality: The company has a long-term, well-developed, company-wide quality program, or it has a quality program recognized as exceptional in U.S. industry. • R&D/Innovation: The company is a leader in its industry for research and development (R&D), particularly by bringing notably innovative products to market. • Benefits to Economically Disadvantaged: The company has as part of its basic mission the provision of products or services for the economically disadvantaged. 	<p>PRODUCT CONCERNS:</p> <ul style="list-style-type: none"> • Product Safety: The company has recently paid substantial fines or civil penalties, or is involved in major recent controversies or regulatory actions, relating to the safety of its products and services. • Marketing/Contracting Concern: The company has recently been involved in major marketing or contracting controversies, or has paid substantial fines or civil penalties relating to advertising practices, consumer fraud, or government contracting. • Antitrust: The company has recently paid substantial fines or civil penalties for antitrust violations such as price fixing, collusion, or predatory pricing, or is involved in recent major controversies or regulatory actions relating to antitrust allegations.