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Corporate social responsibility performance and information asymmetry [☆]

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A B S T R A C T

Using Corporate Social Responsibility (CSR) performance scores from KLD STAT, we investigate whether CSR performance affects information asymmetry. We find that both positive and negative CSR performance reduce information asymmetry. Moreover, we find that the influence of negative CSR performance is much stronger than that of positive CSR performance in reducing information asymmetry. We also investigate the effect of informed investors on the CSR performance-asymmetry relation. We find that the negative association between CSR performance and bid-ask spread decreases for firms with a high level of institutional investors compared to those with a low level of institutional investors. This finding suggests that informed investors may exploit their CSR information advantage. Overall, our results suggest that CSR performance plays a positive role for investors by reducing information asymmetry and that regulatory action may be appropriate to mitigate the adverse selection problem faced by less-informed investors.

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1. Introduction

Corporate Social Responsibility (“CSR”) appears to be gaining interest among regulators, academics, and market participants. Information about CSR performance is particularly important to investors. For example, professional managers in the US hold about \$3.1 trillion assets identified as socially responsible investment (SRI) portfolios as of 2010, suggesting that CSR performance has a direct

[☆] *Data availability:* Data used in this study are available from public sources identified in the paper.

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impact on investors' wealth (Social Investment Forum, 2010). In addition, recent studies indicate that investors seek reliable information about CSR performance through public and/or private channels, and they actively utilize the information in their investment decisions (e.g., CICA, 2010; Cohen et al., 2011; Cruise, 2011).

Despite the growing importance of information regarding firms' CSR performance to investors, evidence on its role in investors' assessments of firm value is scant. In particular, there is little evidence on whether information about CSR performance conveyed through third-party entities provides benefits to investors by reducing uncertainty. If CSR performance is relevant to investors' decisions, are positive and negative CSR performance equally impactful? Furthermore, little is known about the potential different roles of more-informed and less-informed investors in the context of CSR performance. Addressing these questions is important because it enhances our understanding of how CSR performance affects investors' asset allocation processes and provides potentially useful insights regarding policy implications to regulators.

In this study, we shed light on the unexplored link between information about CSR performance and information asymmetry in the stock market. Specifically, we address two research questions: (1) How does CSR performance affect information asymmetry? and (2) Does the relation between CSR performance and information asymmetry differ for firms with more informed investors?¹

We build upon several prior studies in addressing these questions. With respect to the first research question, CSR performance motivates firms' voluntary CSR disclosure (e.g., Clarkson et al., 2008; Dhaliwal et al., 2011; Lyon and Maxwell, 2011) and earnings quality (Kim et al., 2012). Further, third party disclosure provides new information beyond that conveyed by firms' voluntary CSR disclosures (Shane and Spicer, 1983). Such disclosures and/or improved earnings quality increase firms' transparency, which, in turn, should reduce information asymmetry (e.g., Diamond and Verrecchia, 1991; Lambert et al., 2007).

Our second research question extends the prior literature on the information asymmetry between informed investors (institutional investors) and less-informed investors (retail investors) regarding CSR performance (e.g., CICA, 2010; Cohen et al., 2011) and the influence of informed investors on information asymmetry (e.g., Grossman and Stiglitz, 1980; Copeland and Galai, 1983; Glosten and Milgrom, 1985; Kyle, 1985; Easley and O'Hara, 1987; Merton, 1987; Schwartz and Shapiro, 1992). In particular, the presence of informed investors can increase the efficiency with which information is reflected in market prices. However, in some instances the presence of informed investors can increase information asymmetry, depending upon how informed investors elect to execute their trading. Thus we investigate the effect of the presence of differentially-informed investors with respect to CSR performance on the extent of information asymmetry.

To investigate our research questions, we use CSR performance scores from KLD STAT as proxies for firms' CSR performance. In contrast to common practice in prior studies (e.g., Waddock and Graves, 1997; McWilliams and Siegel, 2000; Kim et al., 2012), we decompose the CSR performance indices into positive (i.e., strengths) and negative (i.e., concerns) indicators and adjust for year and industry effects.² This approach enables us to avoid losing useful information about CSR performance in the context of information asymmetry because both positive and negative CSR performance scores can be informative for investment decisions. For instance, investors can interpret a positive CSR performance score (e.g., improving environmental efforts or strengthening customer relationships) as a signal of better monitoring and resource provision by corporate boards. Similarly, a negative CSR performance score resulting from paying fines or engaging in socially controversial activities informs investors of potential changes in firms' profitability or risk owing to CSR-related mismanagement.

Our evidence shows that both positive and negative indicators of CSR performance contribute to reducing information asymmetry. A particularly interesting finding is that the influence of negative

¹ Throughout this paper, we use the terms "informed investors" and "institutional investors" interchangeably to distinguish from less-informed investors.

² Under the approach adopted in several prior studies, if a firm has a positive indicator score of 3 and a negative indicator score of 5, the CSR performance score is a net negative 2, indicating poor CSR performance and masking the underlying performance score components.

CSR performance is much stronger than that of positive CSR performance in reducing information asymmetry.

Regarding our second research question, we find that asymmetry related to CSR performance is relatively higher for firms with higher institutional ownership. Consistent with analytical models (e.g., *Glosten and Milgrom, 1985; Kyle, 1985; Kim and Verrecchia, 1994, 1997; Fisher and Verrecchia, 1999*), we interpret this result as indicating that the adverse selection effects of informed investors (*Kyle, 1985; Glosten and Milgrom, 1985*) are stronger than the information efficiency effects (*Merton, 1987; Akins et al., 2012*) with respect to CSR performance.

In sum, our findings suggest that: (1) investors have divergent opinions about the implications of CSR performance; (2) institutional investors have differential information processing ability as well as superior access to timely and high-quality CSR performance information; and (3) these differences among investors adversely affect information asymmetry (*Beaver, 2002; Bushee and Goodman, 2007*).

We believe that our study makes several contributions. First, our findings address the unexplored link between CSR performance and information asymmetry. Our results indicate that CSR performance generally provides benefits to investors by reducing information asymmetry in the equity market. Our study also sheds light on the importance of separately considering both positive and negative CSR performance when assessing the effects of CSR-related information. Furthermore, we provide insight into the existence and effects of divergent interpretation of CSR performance among informed and uninformed investors.

One policy implication of our findings is that the apparent adverse effect of differentially-informed investors with respect to CSR performance suggests that there may be potential benefits to further development of a publicly-available CSR performance information source and more standardized CSR disclosures.

2. Prior literature and hypothesis development

2.1. CSR performance and information asymmetry

We rely upon past research, both theory and evidence, to develop our hypotheses regarding the implications of CSR performance for investors. Our focus is on the relation between CSR performance and information asymmetry. This relation depends upon three links, as illustrated in Fig. 1.

We explain each of these links in turn.

First, while CSR performance is inherently subjective, extant prior literature supports the finding that scores provided by KLD are reliable proxies for CSR performance (e.g., *Sharfman, 1996; Waddock and Graves, 1997; Chand, 2006; De Villiers and Van Staden, 2011; Kim et al., 2012*).

Second, actual CSR performance as indicated by KLD scores drives transparency because it motivates voluntary disclosure – good-performing firms want to signal their quality by highlighting good performance (*Clarkson et al., 2008*), and poor-performing firms want to explain poor performance (*Patten, 2002*). Recent studies further find that CSR performance also drives earnings quality. *Kim et al. (2012)* find that firms with strong CSR performance are less likely to engage in accruals or real earnings management. They argue that better CSR performance reflects managers' ethical concerns and drives transparent and reliable financial reporting. *Cheng et al. (2011a)* also argue that their findings of a positive association between CSR performance and accessibility to capital are driven by enhanced corporate transparency regarding CSR performance.

Third, extant literature suggests that more transparent firms have reduced information asymmetry between the firm and its investors (e.g., *Diamond and Verrecchia, 1991; Lambert et al., 2007*). To the



Fig. 1. Linking CSR performance with information asymmetry.

extent that CSR performance is relevant for equity valuation, transparency with regard to CSR performance should be no different than financial information presented in the traditional financial reports, and thus we expect that enhanced transparency of CSR performance will also reduce information asymmetry.

Before developing the arguments supporting our two empirical hypotheses, we note that in our empirical setting it is important to address two subtle distinctions: (1) the potential disconnect between CSR performance and information about CSR performance; and (2) the potential disconnect between voluntary CSR disclosure provided by firms and the CSR scores we obtain from KLD STAT.

2.2. CSR performance vs. information about CSR performance

We note that *CSR performance* has the potential to affect equity pricing. Dhaliwal et al. (2011, p. 62) observe, "...some CSR projects have direct implications for positive cash flow even in the near future. For example, practices related to protecting the environment and improving employee welfare can reduce potential litigation and pollution cleaning costs, boost employee morale." *Information about CSR performance* also affects equity pricing indirectly by reducing uncertainty and information asymmetry about the value consequences of CSR activities. As noted above, evidence in prior studies supports the notion that CSR performance scores such as those compiled by KLD are reliably related to actual performance, and it is this information about performance that is the focus of our study.

2.3. KLD CSR scores vs. firm disclosure of CSR performance

Transparency is typically thought of as a property of a firm's information environment that reflects management's discretionary choice about how much information to share with parties outside the firm. In this study, we do not directly measure firms' discretionary CSR disclosure choices. Rather, we focus on the KLD scores. We do this because our direct interest is in the effects of that information on information asymmetry. However, we assume that there is a close correspondence between the KLD scores and firms' underlying disclosure of CSR performance for two reasons: (1) as previously noted, there is a close connection between CSR performance and transparency (Clarkson et al., 2008); and (2) firms' voluntary disclosures are a primary source of the information KLD uses in its measures. Accordingly, we believe that our use of the KLD scores is the appropriate choice for the purposes of our study.

2.4. KLD as an information intermediary

Because KLD obtains information from sources beyond firms' voluntary disclosures, the CSR performance scores provided have the potential to reveal incremental information. For example, if firms selectively disclose positive CSR performance and/or withhold information about negative CSR performance, the CSR performance score serves as new information to investors. Recent surveys (e.g., CICA, 2010; Cohen et al., 2011) find that investors use the third party CSR performance ratings as an important information source to assess a firm's CSR performance for their investment decisions.³ Thus KLD's CSR performance scores are comparable in some respects with information provided by other information intermediaries, such as sell-side financial analysts and have a similar potential to alter investors' perceptions of future cash flows and risk.

In sum, we argue that KLD's CSR performance scores correspond to actual CSR performance, which drives firms' discretionary disclosure of CSR performance, which serves to reduce information asymmetry between investors and the firm. We expect both good and bad CSR performance to correspond to lower information asymmetry because in either case, firms are motivated to provide private information: in case of good performance, firms are keen to note their performance, while bad performers

³ Cohen et al. (2011) find that the retail investors in their experimental setting express a preference for third-party-provided (and/or audited) sources of non-financial information and speculate that it may be due to concerns about the reliability of disclosures.

have an incentive to explain or contextualize their performance (Patten, 2002; Clarkson et al., 2008). Stated formally in the alternative form, our first hypothesis is:

H1. CSR performance scores are negatively associated with information asymmetry.

2.5. CSR performance and informed investors

Investors are not homogeneous in their degree of informedness; insiders, institutional investors, and analysts, for example tend to have relatively more information than other market participants. The existence of information asymmetry among investors results from institutional investors' superior ability or resources employed in gathering information (Shleifer and Vishny, 1986) and/or retail investors' inferior cognitive or processing ability (Merton, 1987).

How do relatively more-informed investors affect the equity market? One perspective suggests that informed investors' private information enables them to actively participate in markets, and their trading helps to disseminate such information to the market. This trading leads other investors to mimic the behavior of the informed investors, resulting in increasing stock market liquidity and reducing the bid-ask spread (e.g., Merton, 1987; Schwartz and Shapiro, 1992; Lakonishok et al., 1992). Thus, informed investors' participation creates an 'information efficiency effect' in markets.

On the contrary, some prior studies suggest that adverse selection of informed investors may widen the bid-ask spread. Kyle (1985) shows that informed investors with private information cash out by trading against uninformed investors. Given an information advantage, informed investors camouflage their trading through small transactions to maximize profits by selling at higher bid prices and buying at lower ask prices. This trading strategy can be sustained until private information is fully revealed to public or as long as profits from trading against less-informed investors are sufficient to cover the cost of information acquisition.⁴ Also, Easley and O'Hara (2004) show that informed investors are better able to adjust portfolios in response to private information. Because less-informed investors cannot adjust their portfolios as effectively due to lack of private information, trading by informed investors increases information asymmetry by raising risks to less-informed investors and thus widens the bid-ask spread.⁵

Recent surveys (CICA survey, 2010; Cohen et al., 2011) indicate that institutional investors have an informational advantage regarding CSR performance as compared to retail investors. According to the CICA survey (2010), institutional investors have access to CSR information directly from firms' managements outside the regulatory filings in addition to reports from research firms or consultants and non-government organizations. On the contrary, retail investors primarily rely on public communication channels (Cohen et al., 2011).

We apply what has been learned in other settings about the effects of differentially-informed investors (information efficiency theory and adverse selection theory) to the context of CSR performance. According to the 'information efficiency' theory, institutional investors will improve market liquidity by trading on the CSR performance, thus disseminating their more timely and more detailed information. Based on this reasoning, the higher the proportion of institutional ownership of a stock, the stronger would be the negative association between CSR performance scores and information asymmetry.⁶

On the other hand, if informed investors exploit their superior private information about CSR performance, adverse selection may lead informed investors to take positions ahead of the arrival of new information (as suggested in Bushee and Goodman, 2007) or use their superior processing ability (Beaver, 2002) to take a position opposite uninformed investors' trades. Based on this reasoning, a higher proportion of institutional ownership of a stock will attenuate any reduction in information's

⁴ Another consequence of this trading activity by informed investors is an increase in the bid-ask spread. Informed investors make profits against not only less-informed investors but also against market makers who stand ready to buy or sell orders at any quoted price for investors (Kyle, 1985). Since market makers' losses from trading with informed investors is costly, market makers impose higher trading costs on all investors to protect themselves from informed traders' adverse selection.

⁵ Kim and Verrecchia (1994) call this information advantage 'information rent'.

⁶ This prediction presumes there is sufficient competition among informed institutional investors (Akins et al. 2012).

asymmetry attributed to CSR performance. Ultimately, which effect prevails is a function of the extent of differential informedness across investor types and how informed investors elect to use any information advantage. This is an empirical question, which we takes form as our second hypothesis. Because we do not have a clear prediction, we state the hypothesis in its null form:

H2. Investor informedness does not affect the association between CSR performance scores and information asymmetry.

3. Data and sample selection

3.1. Data

We use KLD social performance rating scores as our measure of CSR performance. KLD rates corporate social responsibility performance based on multiple attributes (i.e., seven main categories and 38 sub-categories) using several resources, such as financial statements, articles in the business press and academic journals, and government reports. For each attribute, KLD separately rates positive indicators (strengths) and negative indicators (concerns).⁷

3.2. Sample selection

We obtain our initial sample of 51,086 firm-year observations, spanning 7 years from 2003 to 2009, from Compustat and CRSP. After excluding Canadian firms and American Depository Receipts (ADRs), 39,511 firm-year observations remain. Requiring additional variables needed for our multivariate analyses reduce the sample further to 30,877 firm-year observations.⁸ To alleviate the potential effects of extreme observations, we delete observations in the top and bottom 1% of the distribution of bid-ask spread, resulting in 29,853 firm-year observations.⁹ 17,555 of the resulting firm-year observations (4020 firms) have CSR scores from KLD STAT and 12,298 firm-year observations (3626 firms) do not. We obtain institutional ownership variables from Thomson Reuters.

4. Research design

To test whether CSR performance reduces information asymmetry (H1), we conduct two sets of tests. First, we test the effect of CSR performance by comparing firms covered by KLD to those without KLD coverage using the following regression model with an indicator variable (*CSR*) that is set equal to 1 if KLD CSR performance is available:

$$SPREAD_{it} = \alpha_0 + \alpha_1 CSR_{it} + \alpha_2 INST_{it} + \alpha_3 LEV_{it} + \alpha_4 SIZE_{it} + \alpha_5 INVPRICE_{it} + \alpha_6 STD_RET_{it} + e_{it}, \quad (1)$$

where all variables are defined in [Appendix A](#).

Following prior studies (e.g., [Cheng et al., 2011b](#)), we use the bid-ask spread as a proxy for information asymmetry and measure the spread by annually averaging the ratio of the daily bid-ask spread to the closing price from the CRSP daily stock file.¹⁰ We also include the level of institutional investors (*INST_RANK*), size (*SIZE*), leverage (*LEV*), stock price (*INVPRICE*), and stock return volatility (*STD_RET*) as

⁷ KLD tracked the CSR scores of 650 firms every year from 1991 to 2000. In 2001, KLD expanded coverage to the 1000 largest US firms, and in 2003, it increased coverage to the 3000 largest companies. See the data description of the CSR score of the KLD STAT ([KLD, 2008](#)).

⁸ We delete any observations for which variables needed for our multivariate analyses are missing. Additionally, when computing leverage (*LEV*), we delete any observations with a negative value of stockholder's equity.

⁹ To investigate the potential effects of stocks with very small prices, we further delete firms with penny stock (i.e., 699 firm-year observations). However, the results are not materially influenced by this additional sample requirement.

¹⁰ Because of the unavailability of Trade and Quote (TAQ) data, we compute a bid-ask spread using the CRSP daily stock file. Prior studies show that a bid-ask spread using CRSP's Ask or High Price and Bid or Low Price is quite comparable to using TAQ data (e.g., [Corwin and Schultz, 2012](#)).

controls because each has been found to be associated with the bid-ask spread in prior studies. We predict a negative coefficient on CSR if CSR performance reduces information asymmetry.

In the second test, we use only firms covered by KLD and test how information asymmetry varies based upon magnitudes of the CSR performance score. In the three models below, we use three different measures of CSR performance in place of the single indicator variable used in model (1): strengths (*CSRSTR*), concerns (*CSRCON*), and the sum of the two indicators (*CSRALL*).

$$SPREAD_{it} = \beta_0 + \beta_1 CSRALL_{it} + \beta_2 INST_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \beta_5 INVPRICE_{it} + \beta_6 STD_RET_{it} + e_{it} \quad (2.1)$$

$$SPREAD_{it} = \beta_0 + \beta_1 CSRSTR_{it} + \beta_2 INST_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \beta_5 INVPRICE_{it} + \beta_6 STD_RET_{it} + e_{it} \quad (2.2)$$

$$SPREAD_{it} = \beta_0 + \beta_1 CSRCON_{it} + \beta_2 INST_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \beta_5 INVPRICE_{it} + \beta_6 STD_RET_{it} + e_{it}. \quad (2.3)$$

See Appendix A for variable definitions.

We construct the *CSRSTR* (*CSRCON*) index by adding strength (negative) scores from six factors categorized in KLD STAT.¹¹ Those six factors are community, corporate governance, diversity, employment, environment, and production. Because the measures cover broad heterogeneous issues that can have different implications depending on the industry, we annually standardize the measure of CSR performance based on Barth et al.'s (1998) industry classification to control year and industry effects. Finally, to avoid the loss of information by netting the strength scores with concern scores, we add the absolute value of *CSRSTR* and *CSRCON* and denote this figure as *CSRALL*.

To test our second hypothesis (H2), we examine the role of institutional investors (as a proxy for informed investors) in the relationship between CSR performance and information asymmetry.¹² Because our main interest is testing the differential role of the investor informedness level, we focus on the interaction between measures of CSR performance and institutional ownership in the following equations:

$$SPREAD_{it} = \theta_0 + \theta_1 CSRALL_{it} + \theta_2 INST_{it} + \theta_3 CSRALL * INST_{it} + \theta_4 LEV_{it} + \theta_5 SIZE_{it} + \theta_6 INVPRICE_{it} + \theta_7 STD_RET_{it} + e_{it}, \quad (3.1)$$

$$SPREAD_{it} = \theta_0 + \theta_1 CSRSTR_{it} + \theta_2 INST_{it} + \theta_3 CSRSTR * INST_{it} + \theta_4 LEV_{it} + \theta_5 SIZE_{it} + \theta_6 INVPRICE_{it} + \theta_7 STD_RET_{it} + e_{it}, \quad (3.2)$$

$$SPREAD_{it} = \theta_0 + \theta_1 CSRCON_{it} + \theta_2 INST_{it} + \theta_3 CSRCON * INST_{it} + \theta_4 LEV_{it} + \theta_5 SIZE_{it} + \theta_6 INVPRICE_{it} + \theta_7 STD_RET_{it} + e_{it}. \quad (3.3)$$

See Appendix A for definitions of all variables.

If institutional investors' behavior with respect to any CSR performance advantage reduces (widens) information asymmetry, the coefficient on the interaction term will be negative (positive).

¹¹ Although KLD provides seven areas for CSR performance, the human rights category was added in 2002 in non-US operations and contains many missing observations. Thus we use six categories, excluding human rights, to construct our index.

¹² Similar to the distribution of CSR performance measures, the institutional ownership percentage shows a disparity among industry and size groups due to the investment policies of institutions. For example, some small firms have 0% institutional ownership, while moderately-sized firms have more than 50%. This pattern is not uniform across industry groups. We normalize ownership to make the statistics comparable. As a robustness check we also used the rank order of institutional ownership in place of the continuous measure as in Dhaliwal et al. (2011) and found similar results.

Table 1
Descriptive statistics.

Variable	Mean	Median	Q1	Q3	Std. Dev.
<i>Panel A: Firms with CSR performance scores (n = 17,555)</i>					
SPREAD (%)	0.289	0.181	0.112	0.323	0.331
CSRALL	2.999	2.000	1.000	4.000	3.120
CSRSTR	1.275	1.000	0.000	2.000	1.965
CSRCON	1.719	1.000	1.000	2.000	1.757
INST (%)	58.840	66.350	38.893	83.271	29.805
STD_RET	0.034	0.026	0.018	0.038	0.054
LEV	4.055	1.211	0.541	2.742	45.014
SIZE	7.171	7.038	5.931	8.200	1.721
INVPRICE	0.069	0.043	0.027	0.074	0.094
<i>Panel B: Firms without CSR performance scores (n = 12,298)</i>					
SPREAD (%)	2.049	1.380	0.680	2.655	2.009
CSRALL	–	–	–	–	–
CSRSTR	–	–	–	–	–
CSRCON	–	–	–	–	–
INST (%)	21.198	14.652	3.074	33.748	21.328
STD_RET	0.055	0.035	0.023	0.053	0.140
LEV	9.052	0.969	0.364	4.032	531.400
SIZE	4.733	4.584	3.523	5.934	1.667
INVPRICE	0.275	0.136	0.066	0.298	0.469
Difference tests					
Variable	t-test				Wilcoxon Z
<i>Panel C: Test of difference between KLD covered firms and non-KLD covered firms</i>					
SPREAD (%)	96.15***				124.39***
INST (%)	127.19***				97.00***
STD_RET	15.71***				37.71***
LEV	1.04				8.68***
SIZE	122.74**				102.78***
INVPRICE	48.09***				90.56***

Panel A shows descriptive statistics for firms covered by KLD (17,555 firm-years) from 2003 to 2009.

Panel B shows descriptive statistics for firms without KLD coverage (12,298 firm-years) from 2003 to 2009.

Panel C shows results of a test of differences in key variables of KLD covered firms and non-KLD firms.

Variables are defined in Appendix A.

The significance of means and medians is evaluated based on the *t*-test and Wilcoxon test, respectively (*p*-values for the *t*-statistic and *Z*-statistic are two-tailed).

* Statistical significance at the 0.10 level.

** Statistical significance at the 0.05 level.

*** Statistical significance at the 0.01 level.

Table 2
Correlations (n = 17,555).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) SPREAD									
(2) CSRALL	–0.178								
(3) CSRSTR	–0.168	0.800							
(4) CSRCON	–0.135	0.851	0.383						
(5) INST	–0.253	0.101	0.069	0.101					
(6) STD_RET	0.162	–0.079	–0.069	–0.063	–0.052				
(7) LEV	0.013	0.017	0.007	0.015	–0.006	0.005			
(8) SIZE	–0.322	0.528	0.438	0.446	0.133	–0.128	0.039		
(9) INVPRICE	0.474	–0.098	–0.085	–0.080	–0.112	0.154	0.015	–0.308	

Pearson correlation coefficients are presented. The coefficients in bold are statistically significant at the 10% level (two-tailed test). CSRALL, CSRSTR, CSRCON, and INST are annually standardized for industry based on Barth et al.'s (1998) industry classification.

All other variables are defined in Appendix A.

5. Results

5.1. Descriptive statistics

Table 1 provides descriptive statistics. Panel A reports statistics for firms with KLD's CSR performance scores, and panel B shows those statistics for firms without CSR scores. The mean (median) bid-ask spread of firms covered by KLD is 0.289% (0.181%), comparable with that in prior studies. Panel C shows that the characteristics of firms covered by KLD are statistically different from firms not covered by KLD. For example, KLD covered firms are larger in terms of market capitalization, they have higher liquidity, and more institutional holdings than those not covered by KLD.

Table 2 reports the Pearson correlations between variables. The bid-ask spread (*SPREAD*) is negatively correlated with three standardized measures of CSR performance: aggregate CSR scores (*CSRALL*), CSR strengths scores (*CSRSTR*), and CSR concerns scores (*CSRCON*).¹³ We also find that the level of institutional ownership (*INST*) is negatively correlated with bid-ask spreads. For other variables, we find correlations consistent with prior studies, such as a positive correlation between the bid-ask spread and stock return volatility (*STD_RET*) and a negative correlation between the bid-ask spread and firm size (*SIZE*).

5.2. Multivariate results

Table 3 reports the estimated results from the regression model specified in Eq. (1). Our first test, which focuses on the coefficient of *CSR*, captures the effect of CSR performance on information asymmetry by comparing firms covered by KLD to those without KLD coverage. The reported coefficient of *CSR* is negative and statistically significant (-1.277 and significant at the 1% level). These results suggest that CSR performance, on average, reduces information asymmetry.¹⁴

In Table 4, we report the regression analysis results using Eqs. (2.1)–(2.3) that include three different measures of CSR performance (i.e., *CSRALL*, *CSRSTR*, and *CSRCON*). The results show that the aggregate measure of positive and negative indicators of CSR activities (*CSRALL*) is negatively associated with the bid-ask spread (-0.015 and significant at the 1% level). Similarly, we find a negative association between the positive indicator of CSR performance (*CSRSTR*) and bid-ask spread (-0.006 and significant at the 1% level). Interestingly, we also find that the negative indicator of CSR performance (*CSRCON*) is significantly and negatively associated with bid-ask spread (-0.018 and significant at the 1% level). These results strongly suggest that both strength and concern scores of CSR activities play a significant role in reducing stock market information asymmetry.

Next, we examine the role of institutional investors in the association between CSR performance and information asymmetry. Table 5 reports the results of estimating Eqs. (3.1)–(3.3). For each of the three measures of CSR performance (i.e., *CSRALL*, *CSRSTR*, *CSRCON*), we find that the interaction of the CSR performance score and institutional ownership (*CSRALL* * *INST*, *CSRSTR* * *INST*, and *CSRCON* * *INST*) is positively associated with our measure of information asymmetry. We note that the coefficients on the interaction terms and the related stand-alone CSR variables in each of the three models are approximately equal and of opposite sign. That indicates that for firms with relatively higher institutional ownership, there is essentially no relation between CSR performance and information asymmetry.

¹³ We also examine the association between the bid-ask spread and net CSR performance score, measured as total strengths score minus total concerns score. Following Kim et al. (2012), we treat the negative net CSR performance score as zero in regression analysis. The results (not tabulated) show no significant correlation between the two variables. Similarly, the results of regression analysis show no significant association between the two variables. These results confirm our conjecture that the net CSR performance score may obscure information in the underlying positive and negative component scores and thus cause misleading inferences regarding the relation between CSR performance and information asymmetry.

¹⁴ When we use the indicator variable for firms covered by KLD *STAT*, there are two potential measurement errors: (1) we treat firms covered by KLD but with zero *CSRALL* as those with CSR performance information; and (2) we treat firms who may report CSR activities but who are not covered by KLD as *CSR* = 0. To gauge the effects of the first potential measurement error, we re-estimate the model using an indicator variable equal to 1 if the CSR sum is non-zero within firms covered by KLD ($n = 17,555$). The tenor of results (untabulated) is unchanged. For the second potential measurement issue, we find that the number of firms with a zero raw *CSRALL* score is about 10% of total observations ($n = 17,555$). Thus, the potential effects of the second measurement error are likely to be marginal because firms that are not covered by KLD are unlikely to report CSR performance.

Table 3

Test of the effect of CSR performance on information asymmetry using firms covered by KLD and firms not covered by KLD.

	Predicted Sign	Coefficient (<i>t</i> -statistics)
<i>Intercept</i>	+/-	2.031 (56.06) ^{***}
CSR	-	-1.277 (-62.70)^{***}
<i>INST</i>	+/-	-0.187 (-28.07) ^{***}
<i>STD_RET</i>	+	0.385 (2.65) ^{***}
<i>LEV</i>	+/-	-0.001 (-0.40)
<i>SIZE</i>	-	-0.079 (-16.57) ^{***}
<i>INVPRICE</i>	+	1.374 (22.60) ^{***}
Adj. <i>R</i> ²	0.424	
<i>n</i>	29,853	

Robust *t*-statistics based on heteroscedasticity-consistent standard error are reported in parentheses. Institutional investor ownership (*INST*) and CSR performance scores (i.e., *CSRALL*, *CSRSTR*, *CSRCON*) are annually standardized for industry based on Barth et al.'s (1998) industry classification. Variable definitions: CSR = 1 if the firm is covered by KLD, otherwise, 0. All other variables are defined in Appendix A.

* Statistical significance of two-tailed tests at the 0.10 level.

** Statistical significance of two-tailed tests at the 0.05 level.

*** Statistical significance of two-tailed tests at the 0.01 level.

Table 4

Test of the effect of CSR performance on information asymmetry using firms covered by KLD.

	Predicted sign	Model 1	Model 2	Model 3
<i>Intercept</i>	+/-	0.372 (25.39) ^{***}	0.395 (28.24) ^{***}	0.372 (26.83) ^{***}
CSRALL	-	-0.015 (-7.09)^{***}		
CSRSTR	-		-0.006 (-2.98)^{***}	
CSRCON	-			-0.018 (-8.74)^{***}
<i>INST</i>	+/-	-0.053 (-20.90) ^{***}	-0.054 (-20.97) ^{***}	-0.053 (-20.83) ^{***}
<i>STD_RET</i>	+	0.425 (7.20) ^{***}	0.427 (7.27) ^{***}	0.426 (7.21) ^{***}
<i>LEV</i>	+/-	0.001 (1.28)	0.001 (1.28)	0.001 (1.28)
<i>SIZE</i>	-	-0.027 (-16.02) ^{***}	-0.029 (-19.10) ^{***}	-0.027 (-17.36) ^{***}
<i>INVPRICE</i>	+	1.376 (22.94) ^{***}	1.368 (22.97) ^{***}	1.378 (22.91) ^{***}
Adj. <i>R</i> ²		0.291	0.290	0.292
<i>n</i>		17,555	17,555	17,555

Robust *t*-statistics based on heteroscedasticity-consistent standard error are reported in parentheses. Institutional investor ownership (*INST*) and CSR performance scores (i.e., *CSRALL*, *CSRSTR*, *CSRCON*) are annually standardized for industry based on Barth et al.'s (1998) industry classification.

All variables are defined in Appendix A.

* Statistical significance of two-tailed tests at the 0.10 level.

** Statistical significance of two-tailed tests at the 0.05 level.

*** Statistical significance of two-tailed tests at the 0.01 level.

In other words, while CSR performance reduces information asymmetry overall, that effect is not present for the subset of firms with high institutional ownership. Our results are consistent with the interpretation that institutional investors exploit the private information advantage that they have based on their better position to acquire and interpret CSR performance, and this behavior attenuates the asymmetry reduction effects of CSR performance.

Overall, our results suggest that CSR performance, whether socially desirable or undesirable, is helpful in reducing information asymmetry. However, the degree of reduction in information asymmetry is attenuated when there is a higher level of institutional ownership, implying that informed investors exploit their private information about CSR performance and thus negatively influence the association between CSR performance and information asymmetry.

Table 5

Interaction effects of institutional investors and CSR performance on information asymmetry.

	Predicted sign	Model 1	Model 2	Model 3
<i>Intercept</i>	+/-	0.376 (25.64) ^{***}	0.395 (28.34) ^{***}	0.376 (33.34) ^{***}
<i>CSRALL</i>	-	-0.018 (-7.73) ^{***}		
<i>CSRSTR</i>	-		-0.006 (-2.99) ^{**}	
<i>CSRCON</i>	-			-0.020 (-9.23) ^{***}
<i>INST</i>	+/-	-0.051 (-20.43) ^{***}	-0.053 (-20.73) ^{***}	-0.051 (-20.53) ^{***}
<i>INST*CSRALL</i>	+/-	0.018 (6.90)^{***}		
<i>INST*CSRSTR</i>	+/-		0.004 (1.69)[*]	
<i>INST*CSRCON</i>	+/-			0.023 (9.05)^{***}
<i>STD_RET</i>	+	0.416 (7.11) ^{***}	0.427 (7.26) ^{***}	0.415 (7.09) ^{***}
<i>LEV</i>	+/-	0.001 (1.28)	0.001 (1.28)	0.001 (1.29)
<i>SIZE</i>	-	-0.027 (-16.43) ^{***}	-0.030 (-19.25) ^{***}	-0.028 (-17.98) ^{***}
<i>INVPRICE</i>	+	1.372 (22.91) ^{***}	1.368 (22.96) ^{***}	1.371 (22.80) ^{***}
<i>Adj. R²</i>		0.293	0.290	0.295
<i>n</i>		17,555	17,555	17,555

Robust *t*-statistics based on heteroscedasticity-consistent standard error are reported in parentheses. Institutional investor ownership (*INST*) and CSR scores (i.e., *CSRALL*, *CSRSTR*, *CSRCON*) are annually standardized for industry based on Barth et al.'s (1998) industry classification. All others are defined in Appendix A.

* Statistical significance of two-tailed tests at the 0.10 level.

** Statistical significance of two-tailed tests at the 0.5 level.

*** Statistical significance of two-tailed tests at the 0.01 level.

5.3. Additional tests

To address possible alternative explanations for our findings and to further explore some of our findings, we perform two additional tests. The first concern is that aggregating positive or negative CSR performance scores across several CSR dimensions could produce a misleading measure of performance due to managers' volitional choice of CSR activities. To address this issue, we repeat our analysis using the individual dimensions of KLD's CSR score as alternative metrics of CSR performance.

In un-tabulated results based on the individual six components of KLD's CSR performance measure (i.e., community, employee relations, corporate governance, environment, diversity, and product), we find that two positive indicators (i.e., community and employee relationship) are negatively and significantly associated with the bid-ask spread. For negative indicators of CSR performance, three areas (i.e., community, diversity, and employee relationship) are negatively and significantly associated with the bid-ask spread. The lack of significance of some variables should be interpreted cautiously because the institutional investors variable may overlap with the corporate governance measure, and other control variables in the regression model may also incorporate other dimensions of CSR performance. Nevertheless, overall these results confirm that CSR performance reduces market information uncertainty.

Second, to gauge the relative impact of positive and negative CSR performance, we examine whether *CSRCON* differs from *CSRSTR* in reducing information asymmetry. To test this relative difference, we construct a nested model with *CSRSTR* and *CSRCON* variables in the same regression. Untabulated results show that the coefficient of *CSRSTR* is negative but insignificant at the conventional level (-0.002 and insignificant at the 10% level). However, the coefficient of *CSRCON* is negative and significant (-0.017 and significant at the 1% level). Also, we find that the difference in the two coefficients (i.e., *CSRCON* - *CSRSTR*) is positive and significant (*F*-test 16.07). This finding suggests that negative information about CSR performance is more impactful in terms of its effect on information asymmetry than positive information. Considering significant asymmetric reactions of the market to bad news (e.g., Skinner, 1994; Kothari et al., 2009), this result is intuitive and consistent.

6. Conclusion

Regulatory, consumer, societal, and government attention to CSR appears to be on the increase in recent years. In this study, we attempt to add new insights to the literature on CSR performance by

focusing on the relationship between CSR performance and capital market information asymmetry. Specifically, we investigate whether CSR performance reduces the bid-ask spread, a proxy for information asymmetry, and how institutional ownership affects the association between CSR performance and the bid-ask spread.

Using CSR performance information compiled by KLD, we find that both positive and negative CSR performance scores appear to provide information that reduces information asymmetry. Additional analyses show that negative CSR performance has a greater impact on reducing bid-ask spread than does positive CSR performance. This evidence suggests that future studies in the context of capital markets should avoid working with net scores so as to avoid the loss of information contained in the underlying component scores. We further find a significant positive association between the bid-ask spread and the interaction term of institutional ownership and CSR activities, indicating that institutional investors with private CSR performance information appear to exploit that information advantage in a way that attenuates the reduction in information asymmetry.

This paper makes several contributions to the literature. First, our study assesses an unexplored consequence of CSR performance that enhances our understanding of its role in capital market valuation. Second, we document the important role of negative CSR performance, which has been ignored in prior studies. Finally, our study adds evidence about the role of informed investors with respect to the processing of CSR performance. These findings suggest that if policymakers are looking to level the playing field with respect to the availability of CSR performance information, requiring more timely and integrated reporting of both positive and negative CSR performance and mandating a standardized CSR disclosure format may be fruitful.

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Appendix A

Variable	Description
$SPREAD_{it}$	Annual average of the ratio of the daily closing bid-ask spread to the closing price for firm i in the fiscal year t
$CSRALL_{it}$	Standardized sum of strengths and concerns scores (i.e., $CSRSTR + CSTCON$) for firm i in the fiscal year t
$CSRSTR_{it}$	Standardized CSR strengths score for firm i in fiscal year t
$CSRCON_{it}$	Standardized CSR concerns score for firm i in fiscal year t
CSR_{it}	An indicator variable equal to 1 if the observation has CSR coverage from KLD, otherwise, 0
$INST_{it}$	Standardized percentage of institutional ownership for firm i at the end of the fiscal year t
LEV_{it}	Total liabilities divided by the book value of equity firm i in fiscal year t
$SIZE_{it}$	Log of total assets for firm i in fiscal year t
$INVPRICE_{it}$	Inverse of closing stock price firm i in fiscal year t
STD_RET_{it}	Standard deviation of daily stock price returns for firm i in fiscal year t

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