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ORIGINAL PAPER

Corporate Social Responsibility Report Narratives and Analyst Forecast Accuracy

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Abstract Standalone corporate social responsibility (CSR) reports vary considerably in the content of information released due to their voluntary nature. In this study, we develop a disclosure score based on the tone, readability, length, and the numerical and horizon content of CSR report narratives, and examine the relationship between the CSR disclosure scores and analyst forecasts. We find that CSR reporters with high disclosure scores are associated with more accurate forecasts, whereas low score CSR reporters are not associated with more accurate forecasts than firms who do not issue CSR reports. The findings are robust to controlling for firm characteristics including CSR activity ratings and financial narratives. The findings are driven by experienced CSR reporters rather than first-time CSR reporters. Together, our findings suggest that the content of CSR reports helps to improve analyst forecast accuracy, and this relationship is more pronounced for CSR reports with more substantial content.

Keywords Corporate social responsibility reporting · Textual disclosures · Analyst forecasts

Introduction

Investors have increasingly considered corporate social responsibility (CSR) activities when making investment decisions (Elliott et al. 2014). In response, many firms have started to issue standalone CSR reports.[1] While providing extensive information about CSR activities to investors (Simnett et al. 2009; Cohen and Simnett 2014; Casey and Grenier 2015), these reports bring significant capital market benefits to the firms (Lys et al. 2015). For instance, *issuance* of standalone CSR reports reduces cost of equity capital (Dhaliwal et al. 2011) and improves analyst forecast accuracy (Dhaliwal et al. 2012).

The information contained in CSR reports varies in amount and format due to the lack of an enforced CSR reporting framework (Perrini 2005; Holder-Webb et al. 2009; Ramanna 2013; Campopiano and De Massis 2015; Sethi et al. 2015).[2] In addition, the opportunistic incentives of managers to positively skew corporate information coupled with the voluntary nature of CSR reporting can hamper the credibility of CSR reports (Ramanna 2013; Mishra and Modi 2013). Consequently, firms face challenges in enhancing the credibility and thus capital market impact of their CSR reports (Hobson and Kachelmeier 2005; Holder-Webb et al. 2009; Simnett et al. 2009; Cohen and Simnett 2014; Chen et al. 2016).

In order to enhance the credibility and capital market impact of their CSR reports, firms can commit to high-quality financial reporting (Chen et al. 2016), perform effective CSR activities (Dawkins and Fraas 2011; Cho et al. 2006; Dhaliwal et al. 2011; Hummel and Schlick

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[1] These reports take different names such as (corporate) sustainability reports (Ioannou and Serafeim 2012; Simnett et al. 2009), accountability reports (Ramanna 2013), and responsibility reports (Corporate Register).

[2] For example, a study by Governance & Accountability Institute (the U.S. data partner of Global Reporting Initiative) shows a large contextual variation in CSR reports across firms and industries (See http://www.ga-institute.com/research-reports/2014-sustainability-what-matters.html).

2015), and seek assurance from independent CSR assurance providers (Perego and Kolk 2012; Casey and Grenier 2015; Cheng et al. 2015). In addition, can firms use the narratives in CSR reports to enhance credibility? It is not clear whether the *narratives* affect the credibility and capital market impact of CSR reports in addition to the already-established capital market benefits of the *issuance* of CSR reports (Dhaliwal et al. 2011, 2012). To provide insights into this, we construct a disclosure score based on CSR report narratives and examine how this score is associated with analysts' forecast accuracy.

Information about firms' CSR activities will be useful to analysts only if CSR activities affect firms' financial performance. Through a meta-analysis of 127 studies, Margolis and Walsh (2003) document a positive link between CSR activities and firms' financial performance. Recent studies have also documented how CSR activities are linked to financial performance. For example, firms with more CSR activities receive more favorable financing from banks (Goss and Roberts 2011); charitable contributions enhance sales growth (Lev et al. 2010); acquirers with more CSR activities perform better in their M&A deals (Deng et al. 2013); and CSR activities improve financial performance especially for innovative firms (Mishra 2015). In addition, CSR activities and disclosures motivate companies to improve their relationship with their stakeholders (Ioannou and Serafeim 2012; Christensen 2016).

The above evidence, which establishes the link between CSR activities and financial performance, suggests that analysts use information on CSR activities—especially credible CSR information—while forecasting firms' performance. Consistent with this suggestion, CSR Europe, Deloitte, and EuroNext's (2003) survey finds that half of the 400 mainstream mutual fund managers and analysts use CSR-related information in their investment and forecasting models. Similarly, Dhaliwal et al. (2012) document that analysts provide more accurate forecasts for issuers of CSR reports. We extend this finding by examining whether it is the mere act of issuing CSR reports or narratives in the CSR reports that help analysts improve their forecast.

Beyer et al. (2010, p. 312) suggest that "analyzing disclosures using natural language processing techniques seems most promising in creating meaningful disclosure quality measures for large samples." Prior studies that use computer linguistic techniques find that various aspects of financial statement narratives such as pessimism, readability, length, numerical content, and horizon content are informative to users and/or associated with future performance (Li 2010a, b; Muslu et al. 2015). Capitalizing on these findings, we rank CSR reports higher if they include fewer optimistic and more pessimistic keywords; if they are easily readable; if they are longer; and if they have more numerical and horizon content. We then aggregate these aspects into a composite disclosure rank score. We hypothesize that reports with higher disclosure scores will be more useful to investors. Accordingly, we expect that analyst forecast accuracy increases with CSR disclosure scores. If, on the other hand, narratives in CSR disclosures are not credible or if analysts do not pay attention to the narratives but only to firms' decision to issue CSR reports, then analyst forecast accuracy will not increase with CSR disclosure scores after controlling for firms' decision to issue the CSR reports.

Our tests involve dividing firms with CSR reports into low, mid, and high disclosure score groups and treating firms without CSR reports as the benchmark. We then examine current year, one-year-ahead, and two-year-ahead average analyst earnings forecast accuracy across the groups, after controlling for published CSR performance scores and firm characteristics which may affect analyst forecasts as identified by Dhaliwal et al. (2012). We document the following results. First, the average analyst forecast accuracy is not statistically different between firms with low CSR disclosure scores and firms without CSR reports. Second, the average analyst forecast accuracy is significantly higher for firms with middle and high CSR disclosure scores than firms without CSR reports. Third, the average forecast accuracy is significantly higher for firms with high CSR disclosure scores than firms with low CSR disclosure scores. Overall, CSR reports with higher scores help analysts improve their forecasts.

We also distinguish between the first and subsequent CSR reports of a firm, because Dhaliwal et al. (2011) find that initiation of CSR reports is more likely to be linked to the capital market consequences. We find that the positive association between CSR disclosure score and analyst forecast accuracy is more pronounced for subsequent CSR reports than initial CSR reports. This finding suggests that firms build credibility over time through committing to a CSR reporting practices, and that investors and analysts do not simply react to CSR reports without considering firms' long-term CSR reporting practices.

As a robustness check, we re-examine our findings after controlling for two publicly available CSR disclosure quality measures: Presence of Global Reporting Initiative (GRI) framework in CSR reports, and CSR reporting transparency ratings issued by Kinder, Lydenberg, and Domini Research and Analytics (KLD).[3,4] Our narrative-

[3] GRI has pioneered a comprehensive CSR reporting framework that is used worldwide. GRI seeks to improve comparability, credibility, and relevance of CSR information disclosed by different firms and thus to improve users' understanding of sustainability-related risks and opportunities.

[4] KLD provides social screenings and performance rating of firms via its reports and socially screened mutual funds. KLD's CSR performance database is used widely in the literature (e.g., Hillman and Keim 2001; Chatterji et al. 2009; Dhaliwal et al. 2011; Kim et al. 2012).

based CSR disclosure score continues to have a significant and positive association with analyst forecast accuracy after controlling for these alternative measures. This is consistent with our score capturing CSR reporting properties that are beyond those observed by the CSR rating agencies.

Prior research argues that companies have their CSR reports audited to make them more credible to users (Simnett et al. 2009). Building upon this argument, we examine whether CSR reports that are audited complement or substitute for better disclosures. We find that the analyst forecast accuracy is positively associated with the interaction of audited CSR reports and CSR disclosure score. This suggests that external assurance of CSR reports complement the capital market impact of CSR disclosure score.

Our study extends research on reporting CSR activities through standalone reports (Simnett et al. 2009; Elliott et al. 2014; Dhaliwal et al. 2011, 2012; Casey and Grenier 2015; Campopiano and De Massis 2015; Sethi et al. 2015). We provide evidence that not only the decision to issue standalone CSR reports, but also the narrative of CSR reports (e.g., what is said and how it is said) affects market participants.

Second, the literature on corporate sustainability has long been interested in factors that affect the credibility and consequences of voluntary CSR disclosures (Ingram and Frazier 1980; Wiseman 1982). A potential weakness in the previous CSR reporting studies is the reliance on a dichotomous variable for whether or not a firm issues a CSR report. Consequently, these studies offer little insights about CSR reporting quality. To our knowledge, our study is the first that uses a disclosure score based on the content of standalone CSR reports.[5] In addition, our CSR reporting quality measure offers guidelines for companies toward improving the quality and ultimately the impact of their reports. This finding is important, given that the external assurance of CSR reporting, which is another mechanism to improve the credibility of CSR disclosures, remains relatively uncommon in the many parts of the world including the U.S. (Holder-Webb et al. 2009; Simnett et al. 2009; Perego and Kolk 2012).

[5] Cho et al. (2010) and Plumlee et al. (2014) are notable exceptions. Cho et al. (2010) develop an index of optimism bias and uncertainty in 10-K narratives pertaining to environmental disclosure. Consistent with the GRI disclosure framework, Plumlee et al. (2014) develop a disclosure score of voluntary environmental disclosures for a sample of U.S. firms in five industries. Specifically, Plumlee et al. (2014) show that voluntary environmental disclosure score is associated with firm value. They further partition the disclosure score by disclosure type (hard/objective and soft/subjective) and disclosure nature (whether the hard/soft disclosure is related to positive/neutral/negative environmental issues). In contrast to these studies, our disclosure score includes all CSR activities reported on the standalone CSR reports.

Hypothesis Development

The primary objective of this study is to examine how CSR report narratives affect analyst forecasts. For this purpose, we use insights from prior studies on financial narratives.

Narratives in Financial Reports

One stream of research on financial narratives studies their information content. Kothari et al. (2009a) find that favorable (unfavorable) disclosures from firms, analysts, and press are associated with lower (higher) firm risk. Li (2010a) finds that tone of forward-looking statements in Management and Discussion Analysis (MD &A) section of 10-K and 10-Q reports reflects future performance. Feldman et al. (2010), Loughran and McDonald (2011), and Davis et al. (2012) show that investors react to the tone in 10-K reports, 10-Q reports, and earnings announcements, respectively. Collectively, optimistic and pessimistic tones in financial narratives reflect future performance. However, pessimistic tone more strongly reflects future performance and brings stronger investor reaction, suggesting that investors recognize firms' opportunistic incentives. Managers have opportunistic incentives to affect stock prices, avoid regulatory and investor scrutiny, and negotiate debt and compensation contracts (Kothari et al. 2009b).

Another stream of research studies obfuscation incentives of managers. Managers can deflect attention from controversial or unacceptable information to desirable information (Elsbach and Sutton 1992). Firms that publish less readable financial reports have poor performance and less persistent profits (Li 2008). Less readable reports are also associated with higher stock return volatility, higher analyst forecast dispersion, and lower forecast accuracy (Lehavy et al. 2011; Loughran and McDonald 2014). Collectively, less readable financial reports are less informative.

One other stream of research studies the content of narratives (Bryan 1997). Hussainey et al. (2003), Schleicher et al. (2007), and Hussainey and Walker (2009) show that forward-looking MD &A disclosures in the U.K. are informative. Muslu et al. (2015) find that short-horizon MD&A disclosures help investors incorporate information on future performance into stock prices. Collectively, quantitative and future-oriented financial narratives are more informative.

Narratives in Financial Reports Versus CSR Reports

The financial reporting framework, which has developed over centuries, has three important characteristics (Ijiri

1965; Ramanna 2013). First, it discloses verifiable information, mitigating information asymmetry between managers and investors. Verifiability implies that information is auditable so that managers are held accountable for misstatements. Verifiability is also associated with conservatism, which implies that decreases in net assets have lower verification standards than increases in net assets, safeguarding investors from overly optimistic disclosures (Ball et al. 2000). Second, the financial statement reporting framework includes performance and position reports, which are collectively useful to investors (Ramanna 2013). Third, it matches managers' actions to outcomes of the actions because the financial reporting framework is enforced through a combination of litigation, external audit, and regulatory oversight.

CSR reporting lacks these characteristics despite significant attempts to standardize and enforce CSR reporting and auditing framework (Ramanna 2013; Sethi et al. 2015). Firms have significant discretion in whether and how much CSR information to disclose as well as whether to have CSR reports audited.[6] Even when the reports are audited, the scope of the audit pertains typically to the process and not to the information content. Mishra and Modi (2013) show that firms emphasize the positive aspects and ignore the negative aspects of CSR performance. The opportunistic incentives of managers to positively skew CSR reporting coupled with the lack of an enforced CSR reporting framework have the potential to widen the information asymmetry between managers and investors about firms' CSR activities and their financial consequences, rendering CSR reports useless to investors.

The potentially high information asymmetry about CSR activities highlights the importance of examining disclosure quality and information content of CSR reports.[7] GRI states: "A primary goal of reporting is to contribute to an ongoing stakeholder dialogue. Reports alone provide little value if they fail to inform stakeholders or support a dialogue that influences the decisions and behavior of both the reporting organization and its stakeholders" (GRI 2002, p. 9). Accordingly, our objective is to examine whether the narratives of CSR reports are informative to stakeholders and specifically stock investors. We measure the informativeness of CSR reports by improved forecast accuracy of analysts.

Empirical Expectations

Through CSR activities, companies contribute to economic development and improve the quality of life of the workforce, their families, the local community, and the society at large. In their meta-analyses, Orlitzky et al. (2003) and Margolis and Walsh (2003) document a positive association between CSR performance and financial performance. CSR activities enhance financial performance by improving brand image (Brown and Dacin 1997; Lev et al. 2010); attracting and motivating employees (Waddock and Graves 1997; Roberts and Dowling 2002; Edmans 2011); improving relations with regulators (Brown et al. 2006); improving relations with creditors (Goss and Roberts 2011; Cheng et al. 2013); and mitigating regulatory and operational risk (Starks 2009). The widely documented link between CSR performance and performance suggests that CSR disclosures provide useful information to investors (Werther and Chandler 2006). Accordingly, recent research documents that environmental disclosures are associated with significant capital market benefits such as reduced cost of equity capital (Plumlee et al. 2014) and higher share prices (Matsumura et al. 2014).

While Plumlee et al. (2014) and Matsumura et al. (2014) examine disclosures pertaining to a single CSR activity, i.e., environmental activities, Dhaliwal et al. (2011, 2012) examine the incidence of standalone CSR reports that report a wide range of CSR activities. Dhaliwal et al. (2011) find that firms initiating CSR reports achieve a lower cost of equity capital and lower analyst forecast errors when the disclosures could be supported by superior CSR activities. Similarly, Dhaliwal et al. (2012) find that the positive association between CSR reports and analyst forecast accuracy is stronger in countries with stronger stakeholder orientation, presumably because the presence of stronger complementary institutions lends credibility to CSR reporting. These findings suggest that the capital market benefits associated with standalone CSR reports are unlikely to be driven by the CSR report issuance decision alone.

From an information perspective, prior research of disclosures such as earnings announcements and

[6] GRI is the most successful attempt to standardize CSR reporting. The latest GRI guidelines (GRI4) divide CSR reporting into economic, environment, and social categories, with social category further divided into sub-categories of labor practices and decent work, human rights, society, and product responsibility. Furthermore, auditing standards for CSR reporting have recently been developed. For example, the U.K. Institute of Social and Ethical Accountability developed AA1000 Assurance Standard, and the International Auditing and Assurance Standards Board developed the International Standard on Assurance Engagements 3000. Given the lack of an enforced standard CSR reporting, the auditing standards attempt to verify processes.

[7] While a universal notion of disclosure quality does not exist, the conceptual frameworks of the International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) point to various desirable aspects of disclosure such as understandability, relevance, reliability, and comparability (Botosan 2004). There are some notable attempts to measure disclosure score. For instance, Beretta and Bozzolan (2008) use concepts of width (i.e., coverage and dispersion of different topics that qualify a firm's business model) and depth (i.e., insights related to performance) of disclosure besides quantity of disclosure.

Management, Discussion and Analysis (MD&A) section of annual reports shows that the optimistic and pessimistic tones and readability of disclosures are associated with future financial performance and short-term investor reaction (see discussion in "Narratives in Financial Reports" section above). The MD&A and earnings announcements are similar to the CSR standalone disclosures in that there are few standards for the narratives in these reports. For example, the Securities and Exchange Commission (SEC) has continually found MD&A's to be deficient (SEC 1989, 2003; Garmong 2007). Even though the SEC's review found MD&A's to be deficient, research finds that the tone, readability, and content of such disclosures are indicative of disclosure quality (see Muslu et al. 2015). Similarly, we expect that firms with better CSR report disclosures (as measured in tone, readability, and content) reduce the information asymmetry between managers and investors. Consequently, using high-quality CSR disclosures, analysts must be able to better predict performance consequences of CSR activities, improving overall accuracy of their earnings forecasts.[8] This prediction is stated in the following hypothesis.

Hypothesis Firms with better CSR report disclosures are associated with more accurate analyst forecasts.

There are a couple of noteworthy points regarding the hypothesis. First, the voluntary nature of CSR disclosures for standalone CSR reports provides the null hypothesis benchmark (see Ramanna 2013). If firms opportunistically provide information in CSR reports that are not credible and as such not informative, then these disclosures are unlikely to have any significant effect on analyst forecast accuracy (see Mishra and Modi 2013). In addition, if analysts only look for the incidence of the CSR report and do not read the content of the report, then the reports are not likely to be informative.

Second, we focus on analysts forecast accuracy as the proxy for capital market benefits, and not reduced forecast dispersion, because forecast dispersion likely captures a myriad of constructs—disagreements among investors, noise in analysts' private signals, and noise in the analysts' interpretation of public signals to name a few (Barron et al. 1998; Diether et al. 2002; Dische 2002; Barron et al. 2009). Note that our objective is to examine the impact of narratives in CSR reports and develop a disclosure score that can be replicated in large sample studies. Therefore, we focus on the most direct capital market consequence, i.e., forecast accuracy, which proxies for the reduction of information asymmetry between investors and firms.[9]

Empirical Analysis

Sample

The sample consists of all firms with KLD ratings from 2000 to 2011. We follow Dhaliwal et al. (2011, 2012) and compile standalone CSR reports of the KLD-rated firms in the Corporate Register database, which is the leading repository of CSR reports worldwide. There are 24,020 annual observations from 4227 firms with KLD ratings; of these 2462 annual observations from 401 firms have standalone CSR reports.

Table 1, Panel A provides the annual distribution of the sample. The number of KLD-rated firms increased from 455 in 2000 to 2529 in 2011, attesting to stakeholders' and firms' growing emphasis on CSR activities in the U.S. Similarly, the number of KLD-rated firms with standalone CSR reports increased from 34 in 2000 to 393 in 2011. The percentage of KLD-rated firms that issue CSR reports is 7% in 2000 and increases to 16% in 2011, suggesting growing importance of issuing CSR reports. Table 1, Panel B shows that firms that operate in chemicals and utilities industries are more likely to issue CSR reports. As such, we control for year and industry fixed effects in empirical analyses.

CSR Report Disclosure Score

Using insights from the textual analysis of financial reports (as discussed in "Narratives in Financial Reports" section), we measure the disclosure score of narratives in the CSR reports using the following aspects:

1. *Tone* Presentation of content changes users' beliefs independent of content (Levin et al. 1998; Katz 2001; Morris et al. 2007). Optimistic (pessimistic) sentences are likely to pertain to positive (negative) aspects of CSR. Given managers' opportunistic incentives to disclose positive aspects and ignore the negative aspects of CSR (Mishra and Modi 2013), firms that disclose the negative aspects are likely to be more transparent. In other words, CSR reports with more of negative aspects, i.e., pessimistic tone, will have higher disclosure quality; and CSR reports with more of positive aspects, i.e., optimistic tone, will have lower disclosure quality. This is consistent with

[8] Through our review of analysts' research reports, we do not find explicit references to disclosure quality of firms' CSR reports. However, we find frequent references to firms' CSR activities, especially environmental activities. Analysts likely gather information about firms' CSR activities from firms' disclosures, including CSR reports.

[9] When we examine the association between narratives in CSR reports and analysts' forecast dispersion, we find results that are qualitatively similar to that of forecast accuracy. Specifically, analysts' forecast dispersion is lower among firms with high CSR disclosure scores.

Table 1 Sample

	KLD firms	KLD firms with CSR reports	% of KLD firms with CSR reports
Panel A: sample composition by year			
2000	455	34	7
2001	811	69	9
2002	848	98	12
2003	2216	121	5
2004	2362	143	6
2005	2377	159	7
2006	2378	180	8
2007	2435	229	9
2008	2459	278	11
2009	2466	333	14
2010	2684	425	16
2011	2529	393	16
Total	24,020	2462	10
Panel B: sample composition by industry			
Consumer non-durables	1157	157	14
Consumer durables	531	40	8
Manufacturing	2273	390	17
Energy	1071	147	14
Chemicals	681	214	31
Business equipment	4213	370	9
Communication	765	36	5
Utilities	887	280	32
Wholesale, retail, services	2256	204	9
Healthcare and drugs	2414	138	6
Finance	5022	267	5
Other	2750	219	8
Total	24,020	2462	10

The sample includes all U.S. firms with Corporate Social Responsibility (CSR) activity ratings issued by the KLD. The sample period is between 2000 and 2011. Panel A reports the sample breakdown across years. Panel B reports the sample breakdown across 12 Fama and French (1997) industry groups

empirical evidence that examines the narrative disclosures of earnings announcements (Davis and Tama-Sweet 2012). We measure the tone of CSR reports by using "financial negative" and "financial positive" word lists developed by Loughran and McDonald (2011).[10] Pessimistic tone RATIO_PES is calculated as the ratio of the number of financial negative words over total number of words in the report. Optimistic tone RATIO_OPT is calculated as the ratio of the number of financial positive words over total number of words in the report.

2. *Readability* Firms can make disclosures less readable in order to hide poor performance (Li 2008). Again similar to the arguments with the tone of the CSR narratives, firms with more readable CSR reports are more transparent and are less likely to hide and obfuscate CSR activities. We use the Smog (Simple Measure of Gobbledygook) index developed by Harry McLaughlin, which indicates the number of years of formal education a reader of average intelligence needs to understand the report. Specifically, readability is computed as SMOG = 1.043 * [(number of polysyllables) * (30/(number of sentences))]$^{1/2}$ + 3.129.[11]

[10] These lists have been increasingly used in the accounting and finance studies. Li (2010a) suggests that alternative lists, such as Diction, General Inquirer, and the Linguistic Inquiry and Word Count, do not work well for corporate filings. Given that we examine a capital market consequence of CSR reports, we believe the financial tone of the narratives is more appropriate than using a more general list.

[11] We use other readability measures (Li 2008), i.e., Fog, Flesch-Kincaid, and Flesch reading ease indices, and find similar results to those reported.

3. *Length* CSR report length may indicate more information about CSR activity. Longer reports have more information than shorter reports (Li 2008). Accordingly, we use the number of words in the CSR report as the measure of length. However, the length of the report could also proxy for the complexity of CSR activities. Firms with more complex CSR activities are likely to have longer reports. Complexity of CSR activities is likely to reduce the informativeness of the CSR report (see Li 2008 for a similar argument and evidence for financial reports). In addition, firms that want to obfuscate its report could make the report lengthier (Loughran and McDonald 2014). To use report length as an aspect of disclosure quality, we filter out its complexity/obfuscation component. Specifically, we define RESWORDS as the residual from the regression of the CSR report length (log of the number of words in the report) on SMOG.

4. *Numerical Content* Numerical and quantitative information is understood by users, i.e., investors/analysts, with stronger precision than narrative information (Lundholm et al. 2014). King et al. (1990) suggest that quantitative versus qualitative disclosures show the precision of managers' beliefs about the future (also see Hughes and Pae 2004). Huang et al. (2013) find that investors react more when earnings press releases include numbers in their title. As such, we consider more quantitative/numerical information as being indicative of better CSR report disclosure quality. To measure numerical content, we define RATIO_NUM as the ratio of the number of Arabic numerals and quantitative words (e.g., first, second, half) over total number of words in the report.

5. *Horizon Content* CSR information is likely to be more informative when it includes information about future trends and/or targets. Muslu et al. (2015) find that horizon content in forward-looking statements help investors predict future performance. Following Muslu et al. (2015), we measure horizon content of CSR disclosure by defining RATIO_HOR as the ratio of the number of future years plus horizon references (e.g., 2 years, two years, short-term, and upcoming year) over total number of words in the report.

We rank RATIO_OPT, RATIO_PES, SMOG, RESWORDS, RATIO_NUM, and RATIO_ HOR into deciles, with RATIO_OPT and SMOG inverse ranked. We then aggregate the decile ranks into a composite measure of CSR disclosure score (DSCORE). CSR reports with fewer optimistic keywords, more pessimistic keywords, higher readability, more length net of complexity/obfuscation, more numerical content, and more horizon content have higher DSCORE. The decile ranking mitigates potential noise in measurement and enables a meaningful aggregation across the six aspects of disclosure.

Appendix 1 describes the textual analysis and computation of DSCORE. In general, firms with High (Low) DSCORE have consistently high (low) decile ranks in many of the six aspects of DSCORE. Table 2 compares the mean and median of the six aspects of DSCORE across the low, mid, and high DSCORE groups. As indicated by the positive correlations among the six aspects of DSCORE, each aspect increases, on average, moving from the low to the high DSCORE. Collectively, these results suggest that the six aspects of DSCORE capture a common construct of disclosure.

Table 2 also compares the mean and median KLD ratings and firm characteristics across the No-CSR-Report group and the DSCORE groups. Mean KLDSTRENGTH, which is the sum of KLD's positive ratings for different CSR categories, are 0.86, 4.54, 5.99, and 6.12 for the No-CSR, low, mid, and high DSCORE groups, respectively.[12] Mean KLDCONCERN, which is the sum of KLD's negative ratings for different CSR categories, are 1.33, 2.96, 3.70, and 4.11 for the No-CSR-Report, and low, mid, and high DSCORE groups, respectively. Moving from the low to the high DSCORE group, KLD Strength and Concern ratings increase by 35 and 39%, suggesting that better CSR report narratives are informative for favorable and unfavorable CSR information alike. DSCORE is also associated with various firm characteristics, indicating the importance of controlling for firm characteristics while testing the association between CSR report disclosures and analyst forecast accuracy.

Table 3, Panel A shows that the percentage of CSR reports classified as low, mid, and high DSCORE groups are relatively constant over time at around 45, 30, and 25%. Table 3, Panel B shows that wholesale and finance industries stand out as having a lower proportion of CSR reports with high DSCORE's.

Research Design

We test whether higher CSR report disclosure score is associated with analyst forecast accuracy by augmenting Dhaliwal et al.'s (2012) model as below:

[12] KLD rates CSR performance of a large number of firms by using surveys, corporate reports, and news articles. KLD rates CSR performance on seven categories: corporate governance, community, diversity, employee relations, environment, product, and an exclusionary screen for firms deriving revenues from "sin activities" such as alcohol, gambling, and tobacco. When summing up all the positive and negative indicators, we do not consider the corporate governance dimension of the KLD ratings because information transparency is part of that score, and including this dimension could induce a mechanical association between our disclosure score and analyst forecasts accuracy. In robustness tests, we include the corporate governance dimension and find similar results.

Table 2 Descriptive statistics

Mean [median]	No CSR report	DSCORE		
		Low	Mid	High
DSCORE (ranked) components				
(Inverse) Optimism	0	0.46***	0.54***	0.67***
	[0]	[0.4***]	[0.5***]	[0.7***]
Pessimism	0	0.40***	0.62***	0.75***
	[0]	[0.4***]	[0.6***]	[0.8***]
Readability	0	0.49***	0.55***	0.65***
	[0]	[0.4***]	[0.6***]	[0.7***]
Length	0	0.41***	0.64***	0.75***
	[0]	[0.4***]	[0.7***]	[0.8***]
Numerical content	0	0.40***	0.64***	0.77***
	[0]	[0.3***]	[0.7***]	[0.8***]
Horizon content	0	0.41***	0.60***	0.73***
	[0]	[0.3***]	[0.6***]	[0.8***]
CSR performance ratings				
KLDSTRENGTH	0.86	4.54***	5.99***	6.12***
	[0]	[4***]	[5***]	[5***]
KLDCONCERN	1.33	2.96***	3.70***	4.11***
	[1]	[2***]	[3***]	[4***]
Firm characteristics				
ANALYST	11.1	20.33***	20.09***	19.62***
	[9]	[19***]	[19***]	[19***]
SIZE	6.97	9.25***	9.38***	9.43***
	[6.85]	[9.16***]	[9.41***]	[9.37***]
ROAVOL	0.08	0.03***	0.03***	0.03***
	[0.04]	[0.02***]	[0.02***]	[0.02***]
LOSS	0.23	0.11***	0.10***	0.11***
	[0]	[0***]	[0***]	[0***]
FHORIZON	100.86	86.56***	85.93***	87.62***
	[98]	[92***]	[92***]	[92***]
FFIN	0.03	0.04	0.04	0.04
	[0]	[0]	[0]	[0]
ASSURANCE	0	0.01***	0.03***	0.06***
	[0]	[0***]	[0***]	[0***]
LEV	0.19	0.20**	0.21***	0.22***
	[0.13]	[0.19***]	[0.2***]	[0.23***]
ROA	0.02	0.06***	0.06***	0.06***
	[0.04]	[0.05***]	[0.06***]	[0.05***]
R&D	0.04	0.02***	0.02***	0.02***
	[0]	[0*]	[0.01***]	[0***]
CAPX	0.04	0.04	0.05	0.05***
	[0.02]	[0.03***]	[0.04***]	[0.04***]
AGE	2.5	3.41***	3.49***	3.67***
	[2.56]	[3.64***]	[3.71***]	[3.81***]
MKTSHARE	0.01	0.03***	0.04***	0.04***
	[0]	[0.01***]	[0.02***]	[0.02***]

Table 2 compares mean and median of DSCORE (ranked) components, CSR performance ratings, and firm characteristics across the No-CSR-Report group and the three DSCORE groups. *, **, *** indicate statistically significant mean and median differences at 10, 5, and 1% levels between the No-CSR-Report group and low, mid, or high DSCORE groups

Table 3 Sample with low, mid, and high disclosure score

	N	Low (%)	Mid (%)	High (%)
Panel A: DSCORE by year				
2000	34	41	35	24
2001	69	35	41	25
2002	98	53	26	21
2003	121	48	26	26
2004	143	51	23	26
2005	159	52	22	26
2006	180	44	34	22
2007	229	52	32	16
2008	278	49	32	19
2009	333	47	29	24
2010	425	45	34	21
2011	393	44	35	21
Panel B: DSCORE by industry				
Consumer non-durables	157	45	29	27
Consumer durables	40	40	33	28
Manufacturing	390	44	36	20
Energy	147	44	31	26
Chemicals	214	24	48	29
Business equipment	370	56	29	15
Communication	36	42	42	17
Utilities	280	39	30	31
Wholesale, retail, services	204	61	27	11
Healthcare and drugs	138	34	33	33
Finance	267	69	23	8
Other	219	45	22	33

Table 3 reports the percentage of the sample with low, mid, and high CSR reporting disclosure score across years and industries. Appendix 1 describes the procedure of computing DSCORE

$$\begin{aligned}\mathrm{FERROR(X)} = {} & \beta_0 + \beta_1\mathrm{LowDSCORE} + \beta_2\mathrm{MidDSCORE} \\ & + \beta_3\mathrm{HighDSCORE} + \beta_4\mathrm{KLDSTRENGTH} \\ & + \beta_5\mathrm{KLDCONCERN} + \beta_6\mathrm{ANALYST} \\ & + \beta_7\mathrm{SIZE} + \beta_8\mathrm{ROAVOL} + \beta_9\mathrm{LOSS} \\ & + \beta_{10}\mathrm{FHORIZON} + \beta_{11}\mathrm{FFIN} \\ & + \beta_{12}\mathrm{ASSURANCE} + \beta_{13}\mathrm{LEV} \\ & + \beta_{14}\mathrm{ROA} + \beta_{15}\mathrm{R\&D} + \beta_{16}\mathrm{CAPX} \\ & + \beta_{17}\mathrm{AGE} + \beta_{18}\mathrm{MKTSHARE} \\ & + \beta_{19}\mathrm{MILLS} + \gamma\ \mathrm{INDUSTRY} \\ & + \delta\ \mathrm{YEAR} + \varepsilon \end{aligned} \quad (1)$$

FERROR(X) is the average absolute value of forecast errors scaled by the beginning of the year price and multiplied by 100. *X* has values of 0, 1, or 2, standing for current year, one-year ahead, and two-year ahead forecasts, respectively. The coefficient estimates for the low, mid, and high DSCORE groups capture the incremental effect of the respective CSR report disclosure score groups relative to companies with no CSR reports. We expect negative coefficient estimates that decrease with DSCORE. CSR performance ratings are often available to investors through third parties, such as KLD. In order to isolate the effect of DSCORE on analyst forecasts, we control for CSR performance ratings by including KLD Strength and Concern ratings in Eq. (1).

Equation (1) uses several control variables that are likely to confound the association between DSCORE and forecast accuracy (Hope 2003; Dhaliwal et al. 2012). Analyst following (ANALYST) proxies for stronger competition and higher incentives for analysts to enhance forecast accuracy (Lys and Soo 1995). We expect a negative coefficient estimate for ANALYST. Firm size (SIZE) proxies for a firm's general information environment (Atiase 1985; Hope 2003). We expect a negative coefficient estimate for SIZE. Earnings volatility (ROAVOL) proxies for forecast difficulty (Dichev and Tang 2009). We expect a positive coefficient estimate for ROAVOL. Earnings of companies with accounting losses (LOSS) are difficult to predict (Hope 2003). We expect a positive coefficient estimate for LOSS. The median number of days between analyst forecasts and earnings announcements (FHORIZON) proxies for the amount of information available to analysts (O'Brien 1990). We expect a positive coefficient estimate for FHORIZON. FFIN is an indicator of financial opaqueness, which is one if scaled accruals of a firm are higher than the industry-year average (Bhattacharya et al. 2003; Dhaliwal et al. 2012). We expect a positive coefficient estimate for FFIN. We also control for an indicator for whether the CSR report is audited by an independent party (ASSURANCE). To the extent that CSR reports with external assurance are perceived by analysts to be more credible (Dhaliwal et al. 2011; Casey and Grenier 2015; Pflugrath et al. 2011), we expect a negative coefficient estimate for ASSURANCE.

Equation (1) also treats for self-selection, because CSR disclosures can only be observed in standalone CSR reports. Several factors—some unobservable—determine a firm's decision to issue CSR reports. Equation (1) includes the inverse Mills ratio computed from the self-selection treatment in order to control for these unobservable factors (Dhaliwal et al. 2012). Equation (1) also includes all independent variables in the self-selection regression LEV, ROA, R&D, CAPX, AGE, and MKTSHARE—but exclude

Table 4 CSR reporting disclosure score and analyst forecast accuracy

Panel A: descriptive statistics

Mean [median]	No	DSCORE		
	CSR report	Low	Mid	High
FERROR(0)	6.94	2.90***	3.15***	1.90***
	[0.65]	[0.4***]	[0.44***]	[0.41***]
FERROR(1)	13.56	6.23***	6.6***	5.36***
	[1.51]	[0.98***]	[1.01***]	[0.98***]
FERROR(2)	18.41	8.31***	8.53***	7.25***
	[2.11]	[1.32***]	[1.46***]	[1.49***]

Panel B: regression results

	FERROR(0)	FERROR(1)	FERROR(2)
LowDSCORE	−1.60	−3.33	−4.88
	(−1.08)	(−1.25)	(−1.44)
MidDSCORE	−3.32*	−6.36**	−9.05**
	(−1.87)	(−2.06)	(−2.26)
HighDSCORE	−4.83***	−8.42***	−11.25***
	(−2.81)	(−2.68)	(−2.67)
KLDSTRENGTH	1.76***	3.35***	4.70***
	(5.02)	(4.87)	(5.05)
KLDCONCERN	0.38	0.68	0.99
	(1.32)	(1.30)	(1.39)
ANALYST	0.62***	1.17***	1.40***
	(6.59)	(6.93)	(6.02)
SIZE	−8.29***	−15.26***	−20.00***
	(−9.09)	(−9.74)	(−8.96)
ROAVOL	7.24**	15.01***	19.50**
	(2.42)	(2.73)	(2.31)
LOSS	14.82***	29.76***	37.52***
	(7.31)	(7.71)	(6.86)
FHORIZON	0.06***	0.10***	0.15***
	(5.09)	(4.85)	(4.50)
FFIN	−0.36	−1.54	−3.07
	(−0.18)	(−0.53)	(−0.78)
ASSURANCE	−0.87	−2.36	−2.540
	(−0.41)	(−0.53)	(−0.43)
LEV	9.79***	15.72***	18.96**
	(3.16)	(2.97)	(2.40)
ROA	−10.63*	−19.80*	−35.29**
	(−1.82)	(−1.72)	(−2.10)
R&D	−26.44***	−41.22**	−58.28**
	(−2.81)	(−2.48)	(−2.45)
CAPX	11.26	20.89	21.07
	(0.85)	(0.94)	(0.64)
AGE	1.75***	3.98***	5.27***
	(4.06)	(4.50)	(3.65)
MKTSHARE	119.99***	210.88***	260.65***
	(5.42)	(5.01)	(4.44)

Table 4 continued

Panel B: regression results

	FERROR(0)	FERROR(1)	FERROR(2)
MILLS	2.41**	4.39*	6.09**
	(2.08)	(1.95)	(1.96)
Year and industry fixed effects	Yes	Yes	Yes
Adjusted R^2	9.7%	11.7%	12.0%
N	23,847	22,898	18,675
MidDSCORE − LowDSCORE	−1.72	−3.03	−4.15
(t-statistic)	(−1.28)	(−1.34)	(−1.37)
HighDSCORE − MidDSCORE	−1.50	−2.06	−2.20
(t-statistic)	(−1.22)	(−1.1)	(−0.92)
HighDSCORE − LowDSCORE	−3.22**	−5.09**	−6.36**
(t-statistic)	(−2.4)	(−2.07)	(−2.14)

Panel C: regression results with continuous DSCORE measure

	FERROR(0)		FERROR(1)		FERROR(2)	
CSRREPORT	−2.80*	1.65	−5.31**	2.53	−7.45**	2.46
	(−1.93)	(0.61)	(−2.03)	(0.51)	(−2.19)	(0.42)
DSCORE		−1.37*		−2.42*		−3.06*
		(−1.81)		(−1.76)		(−1.85)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	9.7%	9.7%	11.7%	11.7%	12.0%	12.0%
N	23,847	23,847	22,898	22,898	18,675	18,675

In Panel A, *, **, *** indicate statistically significant mean and median differences at 10, 5, and 1% levels between the No-CSR-Report group and low, mid, or high DSCORE groups. In Panels B and C, *, **, *** indicate statistically significant coefficient estimates at 10, 5, and 1% levels based on standard errors clustered by firm. Appendix 2 provides variable definitions

instrumental variables BLUE STATE, RELIGIOUS, DJINDEX, and GREEN. Appendix 3 describes the self-selection treatment in detail.[13] Finally, Eq. (1) includes industry and year-fixed effects, because CSR reports are concentrated in some industries and exhibit an overall time trend.[14] All variables in Eq. (1) are defined in Appendix 2.

Main Results

Table 4, Panel A compares the descriptive statistics for forecast errors across DSCORE groups. For the No-CSR-Report, and low, mid, and high DSCORE groups, the average FERROR(0) are 6.94, 2.90, 3.15, and 1.90%; the average FERROR(1) are 13.56, 6.23, 6.6, and 5.36%; and the average FERROR(2) are 18.41, 8.31, 8.53, and 7.25% of the share price, respectively. Forecast errors generally decrease with DSCORE. Moving from the low to the high DSCORE group, FERROR(0) decreases by 35%, FERROR(1) decreases by 14%, and FERROR(2) decreases by 13%. This trend provides preliminary support to our empirical prediction.

Table 4, Panel B reports results of estimating Eq. (1), after standard errors are adjusted for clustering by firm. Across columns, the coefficient estimates for MidDSCORE and HighDSCORE are negative and statistically significant. In other words, forecast errors decrease with DSCORE, consistent with Panel A. Moving from low to high DSCORE group reduces FERROR(0), FERROR(1), and FERROR(2) by 3.2, 5.1, and 6.4% of share price, respectively. These differences are statistically significant. The signs on the control variables are generally consistent with Dhaliwal et al. (2012). As expected, forecast errors increase with firm size, earnings volatility, loss status, and forecast horizon. At the same time, the coefficients for

[13] Companies in three of the Fama–French 48 industries do not publish any CSR reports. A total of 173 observations from those industries are dropped from the selection model because of perfect prediction; therefore, the sample size used in multivariate analyses drops from 24,020 to 23,847.

[14] Although year-fixed effects control for time-invariant characteristics, the 2008 financial crisis may introduce bias. All our inferences remain the same when we repeat our analyses in the pre-crisis period.

FFIN and ASSURANCE are not significant, and the coefficient for analyst following (ANALYST) is significantly positive. We attribute these differences with Dhaliwal et al. (2012) to the additional CSR-related variables in our model as well as differences in sample characteristics (for instance, Dhaliwal et al. use an international sample). We examine assurance and financial reporting narratives separately in the additional analysis section (see "Controlling for Financial Narratives" and "CSR Disclosure Score and CSR Assurance" sections). Inverse Mills ratio (MILLS) estimated from the first-stage probit model is significant, supporting the importance of controlling for unobservable factors arising from the selection problem. Unreported regression diagnostics show no evidence of multicollinearity, as variance inflation factors are lower than five.

Table 4, Panel C reports the results of estimating Eq. (1) using the continuous measure of DSCORE, rather than the low, mid, and high DSCORE indicators. In this specification, we include an indicator for issuing a CSR report (CSRREPORT), because DSCORE is inherently an interaction between issuing a CSR report and the disclosure score of that report. In the first column, we test the benchmark FERROR(0) model from Dhaliwal et al. (2012) without the DSCORE variable. Consistent with Dhaliwal et al. (2012), the coefficient on CSRREPORT is negative and significant. In the second column, we add our main test variable DSCORE, and the coefficient estimate for DSCORE is negative and significant, supporting our hypothesis. Interestingly, CSRREPORT is no more significant when we add DSCORE in Eq. (1). In columns 3 through 6, we repeat the analyses with FERROR(1) and FERROR(2), and find similar results.

Overall, findings in Table 4 suggest that firms issuing CSR reports with LowDSCORE do not necessarily improve analyst forecast accuracy relative to firms issuing no CSR reports. However, firms issuing CSR reports with mid and high DSCORE improve analyst forecast accuracy. The findings extends prior literature by showing that the CSR reporting quality plays an important role in affecting analyst forecasts in addition to the decision to issue CSR reports.

Additional Analysis

Components of CSR Report Disclosure Score

CSR reports vary in the components of the DSCORE. In the absence of theory on which components drive the CSR report informativeness, we empirically search for the major drivers of CSR report informativeness. Consistent with the prior analysis, we divide the six DSCORE components into high (i.e., upper quartile) and low (i.e., lower three quartiles) groups in order to address non-linear effect of these components on analyst forecasts. Consistent with our reverse ranking of RATIO_OPT and SMOG components while constructing the DSCORE, we multiply these two components by −1 before identifying the high and low groups.

Table 5, Panel A compares the descriptive statistics for forecast errors between the high and low component groups. For low and high RATIO_HOR groups, the average FERROR(0) is 2.73 and 2.89%; the average FERROR(1) is 6.56 and 5.24%; and the average FERROR(2) is 8.49 and 7.39% of the share price, respectively. In other words, analyst forecast errors generally decrease with RATIO_HOR. A similar pattern is observed in RATIO_PES, RATIO_OPT*(−1), and SMOG*(−1) components. RATIO_NUM and RESWORDS components, however, show the opposite pattern. For instance, for low and high RATIO_NUM groups, the average FERROR(0) is 2.24 and 4.02%; the average FERROR(1) is 4.88 and 9.26%; and the average FERROR(2) is 6.43 and 12.33% of the share price, respectively. The univariate statistics should be interpreted with caution, because other factors that are correlated with the disclosure score components could be driving the statistics.

Table 5, Panel B reports the results of estimating a modified version of Eq. (1) that replaces DSCORE with the low and high indicators of DSCORE's components. For brevity, we only report results with FERROR(0) as the dependent variable. Largely consistent with the univariate comparisons in Panel A, we find the following results. First, the high group of RATIO_HOR, RATIO_PES, and SMOG*(−1) components are negatively associated with analyst forecast errors. Second, the low groups of RATIO_NUM, RESWORDS, and RATIO_OPT*(−1) components are negatively associated with analyst forecast errors, while the high group of these variables are not statistically significant. The difference across the high and low groups is not statistically significant at conventional levels for either of the six components. Overall, individual components of DSCORE appear to not affect analyst forecasts as much as their aggregation, DSCORE. The non-linear relationship between DSCORE and forecast errors also suggests that some components may be informative at levels higher than their highest quartile. We conclude that components of CSR disclosure score contribute to improved analyst forecast accuracy, but not in a linear fashion; and furthermore, considering the aggregate score appears to be more important.

First and Subsequent CSR Reports

In our study, we predict and show that analysts would react to higher quality narratives of CSR reporting. Accordingly, in this section, we examine whether the positive association between DSCORE and analyst forecast accuracy is different between the first and subsequent issuance of CSR

Table 5 Components of CSR reporting disclosure score

Panel A: descriptive statistics

Mean [median]	No CSR report	RATIO_HOR		RATIO_NUM		RESWORDS	
		Low	High	Low	High	Low	High
FERROR(0)	6.94	2.73***	2.89***	2.24***	4.02**	2.38***	3.64***
	[0.65]	[0.42***]	[0.39***]	[0.38***]	[0.49***]	[0.42***]	[0.38***]
FERROR(1)	13.56	6.56***	5.24***	4.88***	9.26	5.15***	8.46**
	[1.51]	[0.99***]	[0.96***]	[0.9***]	[1.25***]	[1.01***]	[0.91***]
FERROR(2)	18.41	8.49***	7.39***	6.43***	12.33	6.63***	11.57**
	[2.11]	[1.37***]	[1.39***]	[1.28***]	[1.76***]	[1.36***]	[1.44***]
Mean [median]	No CSR report	RATIO_PES		RATIO_OPT*(−1)		SMOG*(−1)	
		Low	High	Low	High	Low	High
FERROR(0)	6.94	2.97***	2.29***	2.94***	2.32***	3.37***	1.24***
	[0.65]	[0.4***]	[0.44***]	[0.4***]	[0.42***]	[0.45***]	[0.33***]
FERROR(1)	13.56	6.72***	4.90***	6.53***	5.24***	7.51***	2.80***
	[1.51]	[0.98***]	[1.01***]	[0.95***]	[1.05***]	[1.05***]	[0.82***]
FERROR(2)	18.41	8.89***	6.51***	8.66***	6.88***	9.92***	3.80***
	[2.11]	[1.33***]	[1.52***]	[1.39***]	[1.33***]	[1.54***]	[1.06***]

Panel B: regression results

	Dependent variable = FERROR(0)					
	X = RATIO_HOR	X = RATIO_NUM	X = RESWORDS	X = RATIO_PES	X = RATIO_OPT * (−1)	X = SMOG * (−1)
Low[X]	−2.36	−2.36*	−3.01**	−2.46	−2.86*	−2.36
	(−1.54)	(−1.76)	(−2.13)	(−1.60)	(−1.96)	(−1.48)
High[X]	−3.62**	−3.60	−1.99	−3.27*	−2.29	−3.82***
	(−2.15)	(−1.56)	(−1.04)	(−1.80)	(−1.34)	(−2.65)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	9.7%	9.7%	9.7%	9.7%	9.7%	9.7%
N	23,847	23,847	23,847	23,847	23,847	23,847
High X-Low X	−1.26	−1.24	1.02	−0.81	0.56	−1.46
(t-statistic)	(−0.88)	(−0.66)	(0.72)	(−0.49)	(0.48)	(−1.21)

In Panel A, *, **, *** indicate statistically significant mean and median differences at 10, 5, and 1% levels between the No-CSR-Report group and Low and High DSCORE groups. In Panel B, *, **, *** indicate statistically significant coefficient estimates at 10, 5, and 1% levels based on standard errors clustered by firm. Appendix 2 provides variable definitions

reports. To investigate, we re-estimate Eq. (1) after replacing DSCORE indicators with first and subsequent DSCORE indicators (i.e., FirstLowDSCORE and SubsLowDSCORE; FirstMidDSCORE and SubsMidDSCORE; and FirstHighDSCORE and SubsHighDSCORE). There are 401 first CSR reports in the sample, out of which 58% are classified as FirstLowDSCORE and 17% are classified as FirstHighDSCORE.

Table 6 provides the results of the estimation. When compared to first CSR reports, forecasts errors are lower for subsequent CSR reports and especially those CSR reports in the mid and high DSCORE groups. This evidence suggests committing to a long-term disclosure strategy helps firms in building the credibility of CSR reporting over years.

Incremental Effect of DSCORE Over GRI and KLD Transparency Measures

KLD rates a firm's CSR disclosure quality using a Reporting Strength/Concern indicator. This rating is not

Table 6 First and subsequent CSR reports

	FERROR(0)		FERROR(1)		FERROR(2)	
SubsLowDSCORE	−0.56	−0.57	−1.01	−1.02	−1.68	−1.70
	(−0.47)	(−0.48)	(−0.45)	(−0.45)	(−0.59)	(−0.60)
SubsMidDSCORE	−5.04***	−5.04***	−9.64***	−9.65***	−12.76***	−12.76***
	(−3.32)	(−3.32)	(−3.26)	(−3.26)	(−3.15)	(-3.15)
SubsHighDSCORE	−3.83**	−3.82**	−8.41***	−8.40***	−11.83***	−11.81***
	(−2.39)	(−2.39)	(−2.69)	(−2.69)	(−2.83)	(−2.83)
FirstCSR		−0.40		−1.71		−2.09
		(−0.29)		(−0.87)		(−0.72)
FirstLowDSCORE	−0.39		−1.85		−1.92	
	(−0.29)		(−0.79)		(−0.58)	
FirstMidDSCORE	1.46		1.53		1.33	
	(0.29)		(0.21)		(0.13)	
FirstHighDSCORE	−3.05*		−5.73*		−7.16*	
	(−1.74)		(−1.90)		(−1.85)	
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	9.7%	9.7%	11.6%	11.7%	12.0%	12.0%
N	23,847	23,847	22,898	22,898	18,675	18,675
SubsMidDSCORE − SubsLowDSCORE	−4.48**	−4.47**	−8.64**	−8.64**	−11.08**	−11.07**
(t-statistic)	(−2.54)	(−2.54)	(−2.4)	(−2.41)	(−2.35)	(−2.36)
SubsHighDSCORE − SubsMidDISCLOSURE	1.21	1.22	1.23	1.25	0.93	0.96
(t-statistic)	(0.74)	(0.75)	(0.42)	(0.43)	(0.24)	(0.25)
SubsHighDSCORE − SubsLowDSCORE	−3.27*	−3.25*	−7.41*	−7.38*	−10.15**	−10.12**
(t-statistic)	(−1.74)	(−1.73)	(−1.94)	(−1.94)	(−2.14)	(−2.14)
FirstMidDSCORE − FirstLowDSCORE	1.84		3.38		3.24	
(t-statistic)	(0.33)		(0.41)		(0.29)	
FirstHighDSCORE − FirstMidDSCORE	−4.51		−7.26		−8.49	
(t-statistic)	(−0.82)		(−0.88)		(−0.77)	
FirstHighDSCORE − FirstLowDSCORE	−2.67		−3.88		−5.24	
(t-statistic)	(−1.43)		(−1.24)		(−1.27)	

*, **, *** indicate statistically significant coefficient estimates at 10, 5, and 1% levels based on standard errors clustered by firm. Appendix 2 provides variable definitions

focused on the CSR report narratives but on the overall CSR-related disclosures. In addition, many U.S. companies have increasingly issued their CSR reports following the GRI guidelines. A study conducted by the Governance & Accountability Institute shows that investors demand S&P 500 companies report CSR information under the GRI framework.[15] Thus, KLD reporting rating and GRI status both can proxy for CSR reporting quality. Nevertheless, developing an objective measure of CSR report disclosure is important for the following reasons. First, both KLD and GRI ratings are binary variables, and thus hold limited information about the disclosure quality of the CSR reports. Second, how KLD rates firms for CSR disclosure is not fully known. Third, GRI guidelines focus on the form but not substance of CSR disclosures. In contrast, our measure depends on the substance of the disclosures. Furthermore, it is transparent and thus can be refined by future research on different narratives.

In this section, we test whether DSCORE is significantly associated with analyst forecast accuracy after controlling for the KLD reporting ratings and GRI status. Table 7, Panel A presents how low, mid, and high DSCORE indicators correlate with indicators for companies following the GRI guidelines as well as indicators for companies with KLD-assigned reporting Strength and Concern ratings. We find that percentage of CSR reports that comply with the GRI guidelines are 16, 45, and 53% for the low, mid, and

[15] The report entitled "2012 Corporate ESG/Sustainability/Responsibility Reporting-Does It Matter? Analysis of S&P 500 Companies' ESG Reporting Trends and Capital Markets Response" is available at http://www.ga-institute.com/research-reports/2012-corporate-esg-sustainability-responsibility-reporting-does-it-matter.html.

Table 7 Alternative measures of DSCORE

Panel A: descriptive statistics

Mean [median]	No CSR Report	DSCORE		
		Low	Mid	High
GRI	0	0.16***	0.45***	0.53***
	[0]	[0***]	[0***]	[1***]
KLD_REPORTSTRENGTH	0.01	0.22***	0.45***	0.54***
	[0]	[0***]	[0***]	[1***]
KLD_REPORTCONCERN	0.48	0.30***	0.24***	0.27***
	[0]	[0***]	[0***]	[0***]

Panel B: regression results

	FERROR(0)		FERROR(1)		FERROR(2)	
LowDSCORE	−1.87	−1.94	−3.89	−4.01	−3.89	−4.01
	(−1.24)	(−1.33)	(−1.44)	(−1.54)	(−1.44)	(−1.54)
MidDSCORE	−3.95**	−4.06**	−7.69***	−7.93***	−7.69***	−7.93***
	(−2.32)	(−2.48)	(−2.60)	(−2.82)	(−2.60)	(−2.82)
HighDSCORE	−5.55***	−5.63***	−9.95***	−10.25***	−9.95***	−10.25***
	(−3.02)	(−3.16)	(−3.12)	(−3.31)	(−3.12)	(−3.31)
GRI	1.44	1.38	3.06	2.69	3.06	2.69
	(0.92)	(0.90)	(1.01)	(0.96)	(1.01)	(0.96)
KLD_REPORTSTRENGTH		0.00		1.33		1.33
		(0.00)		(0.36)		(0.36)
KLD_REPORTCONCERN		−0.93		−0.31		−0.32
		(−0.55)		(−0.08)		(−0.08)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	9.7%	9.7%	11.7%	11.6%	11.7%	11.6%
N	23,847	23,847	22,898	22,898	22,898	22,898
MidDSCORE − LowDSCORE	−2.08*	−2.12*	−3.80*	−3.92*	−3.80*	−3.92*
(t-statistic)	(−1.67)	(−1.67)	(−1.8)	(−1.84)	(−1.8)	(−1.84)
HighDSCORE − MidDSCORE	−1.60	−1.57	−2.27	−2.32	−2.27	−2.32
(t-statistic)	(−1.25)	(−1.19)	(−1.18)	(−1.15)	(−1.18)	(−1.15)
HighDSCORE − LowDSCORE	−3.68***	−3.69**	−6.06**	−6.24**	−6.06**	−6.24**
(t-statistic)	(−2.65)	(−2.5)	(−2.48)	(−2.41)	(−2.48)	(−2.41)

In Panel A, *, **, *** indicate significant mean and median differences at 10, 5, and 1% levels between the No-CSR-Report group and low, mid, and high DSCORE groups. In Panel B, *, **, *** indicate significant coefficient estimates at 10, 5, and 1% levels based on standard errors clustered by firm. Appendix 2 provides variable definitions

high DSCORE groups, respectively. That is, CSR reports that follow the GRI guidelines are also more likely to be classified as higher disclosure score by our substance-based measure. Similarly, percentage of CSR reports that have KLD-assigned reporting Strength (Concern) ratings are 22% (30%), 45% (24%), and 54% (27%) for the low, mid, and high DSCORE groups, respectively. That is, our CSR disclosure ratings correlate with the KLD reporting Strength and Concern ratings. Collectively, these univariate statistics provide additional validity to DSCORE.

Table 7, Panel B reports the results of Eq. (1) after adding the indicators for companies following the GRI guidelines as well as indicators for companies with KLD-assigned reporting Strength and Concern ratings. DSCORE is incrementally associated with analyst forecasts errors after controlling both GRI status and KLD-assigned reporting ratings. In fact, the coefficient estimates for these additional controls do not load significantly. Collectively, the results in Table 7 corroborate the effect of DSCORE on analyst forecast accuracy.

Table 8 Controlling for characteristics of 10-K narratives

	FERROR(0)	FERROR(1)	FERROR(2)
LowDSCORE	−0.80	−1.91	−3.06
	(−0.45)	(−0.59)	(−0.76)
MidDSCORE	−3.16	−5.96	−9.13*
	(−1.50)	(−1.62)	(−1.95)
HighDSCORE	−4.95**	−8.49**	−11.29**
	(−2.51)	(−2.33)	(−2.28)
10KOPT	2.03	3.47	6.04
	(1.34)	(1.26)	(1.61)
10KPES	6.13***	10.19***	13.93***
	(3.23)	(2.99)	(2.91)
10KREADABLE	0.06	0.28	0.97
	(0.04)	(0.11)	(0.25)
10KLONG	6.99***	13.17***	14.42***
	(4.00)	(4.40)	(3.50)
Firm characteristics	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes
Adjusted R^2	10.2%	12.3%	12.6%
N	20,820	19,917	16,013
MidDSCORE − LowDSCORE	−2.36	−4.05	−6.07
(t-statistic)	(−1.41)	(−1.44)	(−1.6)
HighDSCORE − MidDSCORE	−1.79	−2.53	−2.16
(t-statistic)	(−1.19)	(−1.15)	(−0.74)
HighDSCORE − LowDSCORE	−4.14***	−6.58**	−8.23**
(t-statistic)	(−2.66)	(−2.32)	(−2.39)

*, **, *** indicate statistically significant coefficient estimates at 10, 5, and 1% levels based on standard errors clustered by firm. Appendix 1 defines 10-K disclosure variables; Appendix 2 provides other variable definitions. Sample period is between 2000 and 2009

Controlling for Financial Narratives

We control for a company's financial narratives using deciles of 10-K report optimism (10KOPT), pessimism (10KPES), readability (10KREADABLE), and length (10KLONG) in addition to other control variables in Eq. (1).[16] We do this because CSR report narratives may simply reflect the companies' financial narratives and thus the findings above may be driven by informativeness of financial narratives. Inconsistent with this explanation, Table 8 shows that a significant and positive association between DSCORE and analyst forecast accuracy remains after controlling for the variables measuring a company's financial narrative style.

[16] We use our Java based textual analysis algorithm to calculate 10-K optimism, pessimism, readability, and length scores. Since this requires extensive resources, we limit the sample period to years 2000–2009. We do not consider numerical and horizon content in the 10-K, because part of numerical and horizon content is mandated (e.g., tables). Appendix 1 includes definition of variables.

CSR Disclosure Score and CSR Assurance

Assurance of CSR reporting by independent organizations, while uncommon, reduces information asymmetry between companies and investors (Casey and Grenier 2015). Accordingly, we examine whether external assurance of CSR reports substitutes or complements disclosure quality. Specifically, we add to Eq. (1) the interaction of DSCORE and ASSURANCE. Table 9 reports the results of this estimation. Although the main effect of ASSURANCE does not load up in our earlier regression models (see Table 4, Panel B), the interaction is significantly negative. In other words, the positive effect of DSCORE on forecast accuracy is enhanced when the CSR report is also audited, suggesting that CSR disclosure quality and CSR assurance are complements to one another in improving analyst forecast accuracy.

Conclusion

Unlike financial reporting, which is subject to a well-developed accountability framework, CSR reporting is largely voluntary and unregulated. Yet prior literature shows

Table 9 Incremental effect of assurance on analyst forecast accuracy

	FERROR(0)	FERROR(1)	FERROR(2)
CSRREPORT	1.385	2.012	1.885
	(0.51)	(0.40)	(0.32)
DSCORE	−1.291*	−2.263	−2.895*
	(−1.68)	(−1.63)	(−1.73)
DSCORE * ASSURANCE	−4.064**	−9.538**	−11.353*
	(−2.04)	(−2.09)	(−1.88)
Firm characteristics	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes
Adjusted R^2	9.7%	11.7%	12.0%
N	23,847	22,898	18,675

*, **, *** indicate statistically significant coefficient estimates at 10, 5, and 1% levels based on standard errors clustered by firm. Appendix 2 provides variable definition

that issuance of standalone CSR reports is associated with capital market benefits such as lower cost of capital and analyst forecast accuracy (Dhaliwal et al. 2011, 2012). In this paper, we search for an explanation behind these findings. In particular, we ask whether capital market benefits come primarily because of the fact that companies disclose their CSR activities in a standalone CSR reports or because of the quality and credibility of their disclosures in their CSR reports.

We rate the quality of disclosures in standalone CSR reports using insights from the financial reporting literature that use computer linguistic techniques. We assign higher disclosure scores if CSR reports have fewer optimistic and more pessimistic keywords; if they are more easily readable; if they are longer; and if they have more numeric and horizon content. Our tests show that analyst forecast accuracy increases with CSR report disclosure scores. In addition, firms with low CSR report disclosure scores do not have better analyst forecast accuracy than firms without CSR reports. These findings highlight the importance of high-quality CSR report disclosures in comparison to simply issuing CSR reports.

Our paper uses objective criteria for analyzing CSR report narratives and takes a first step in developing a disclosure score for standalone CSR reports. Our analysis regarding the six individual components of the disclosure score shows that individual components are not statistically significantly associated with analyst forecast accuracy. While this suggests the importance of aggregating individual components of disclosure quality, future research can help to refine our disclosure score by either considering additional aspects of CSR report narratives and/or refining our linguistic measures, noting the importance of non-linearity as well as aggregation of the components. We believe that our measure of CSR disclosure quality has significant potential to summarize the narratives in other financial and non-financial contexts, and thus help regulatory efforts to make these disclosures more effective. For instance, the SEC has been reviewing overall disclosure requirements and considering ways to improve the disclosure regime for the benefit of both companies and investors since December 2013 (https://www.sec.gov/spotlight/disclosure-effectiveness.shtml).

We use computer linguistic methods that can be readily employed on larger samples with lower risk of subjective evaluations; nevertheless, the limitation of our approach is that the measure could introduce noise. Following a different track, Sethi et al. (2015) conduct a content analysis of CSR reports and score disclosure dimensions based on the level of details provided in the CSR report—the CSR-S Monitor.[17] We echo Sethi et al.'s (2015) suggestion that various methods will incrementally validate disclosure quality, given the significant variation in CSR reporting.

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Appendix 1: Textual Analysis

Procedure

1. We match CSR reports with firm identifiers in the *Compustat* and *CRSP* databases, i.e., CUSIP, PERMNO, TICKER, and GVKEY, resulting in 1796 firm-years with CSR reports.
2. We format CSR reports to txt format and use a Java code to analyze narratives in the reports.

[17] CSR-S Monitor is a Weissman Center of International Business Project at Baruch College, City University of New York, New York.

3. Some firms publish CSR reports every 2 or 3 years. We assume that firms have the same CSR report narratives in non-report years as in their most recent CSR reports. For example, if a firm issued CSR reports in 2008 and 2010 (but not in 2009 and 2011), we fill CSR data in 2009 with that in 2008, and CSR data in 2011 with that in 2010. This forward-filling procedure increases our sample from 1796 to 2462 firm-years.

Aspects of CSR Report Disclosure Score

Based on prior literature, we consider a CSR report to have a high disclosure score if (1) it includes fewer optimistic words, (2) it includes more pessimistic words, (3) it is readable, (4) it is long, (5) it includes numerical information, and (6) it includes horizon-related information. CSR report disclosure score (DSCORE) is composed of the following six independent components:

1. Optimism (RATIO_OPT): Number of financial positive words divided by total number of words in the CSR report (Loughran and McDonald 2011; http://www3.nd.edu/~mcdonald/Word_Lists.html).

2. Pessimism (RATIO_PES): Number of financial negative words divided by the total number of words in the CSR report. (Loughran and McDonald 2011; http://www3.nd.edu/~mcdonald/Word_Lists.html).

3. Readability (SMOG): The Smog (Simple Measure of Gobbledygook) index is based on the number of years of formal education a reader of average intelligence would need to read and understand the text. It is defined as $1.043 * [(\text{number of polysyllables}) * (30/(\text{number of sentences}))]^{1/2} + 3.1291$. Polysyllables are words that have more than three syllables.

4. Length (RESWORDS): We first measure the length of a CSR report by the logarithm of the total number of words (WORDS). We then orthogonalize WORDS relative to its obfuscation component (SMOG). RESWORDS is defined as the residual from the regression $\text{WORDS} = \alpha + \beta * \text{SMOG} + \varepsilon$, which is estimated for each year and Fama and French (1997) industry.

5. Numerical Content (RATIO_NUM): Number of Arabic numerals and numerical words divided by the total number of words in the CSR report (Muslu et al. 2015). Numerical words are the following words: "first," "second," "third," "fourth," "fifth," "sixth," "seventh," "eighth," "ninth," "tenth," "eleventh," "twelfth," "thirteenth," "fourteenth," "fifteenth," "sixteenth," "seventeenth," "eighteenth," "nineteenth," "twentieth," "half," "quarter," "double," "triple," and "quadruple."

6. Horizon Content (RATIO_HOR): The number of references to future years and horizon words divided by the total number of words in the CSR report (Muslu et al. 2015). 2012 (2007) is (is not) a future year reference for a CSR report issued in 2008. Horizon words include short-horizon and long-horizon words. Short-horizon words are the following words: "short term," "short-term," "current fiscal," "current quarter," "current year," "months," "coming month," "coming period," "coming quarter," "following month," "following period," "following quarter," "incoming month," "incoming period," "incoming quarter," "next month," "next period," "subsequent month," "subsequent period," "subsequent quarter," "upcoming month," "upcoming period," "upcoming quarter." Long-horizon words are the following words: "k years" where k is from 2 to 20 in numbers and from "two" to "twenty" in writing; "century," "decade," "foreseeable future," "long-term," "long term," "coming year," "following year," "incoming year," "next year," "subsequent year," and "upcoming year."

Descriptive Statistics of the Six Aspects of DSCORE

The table below provides the descriptive statistics of the six components of DSCORE:

*1000 except SMOG and RESWORDS	Mean	Std. Dev.	Min	Q1	Q2	Q3	Max
RATIO_OPT	15.9	6.0	0	13.0	15.8	19.0	36.0
RATIO_PES	7.9	4.2	0	5.3	7.5	10.1	22.6
SMOG	20.3	13.3	4.5	17.5	18.6	19.7	128.4
RESWORDS	0.0	1.0	−3.6	−0.6	0.1	0.8	2.2
RATIO_NUM	38.0	23.9	0	23.0	34.4	46.8	160.4
RATIO_HOR	1.6	1.3	0	0.8	1.3	2.0	7.1

Average RATIO_OPT is higher than RATIO_PES, consistent with managerial optimism in CSR disclosures. Average SMOG implies that an average reader needs to have a graduate level degree to understand a CSR report. Average RESWORDS is by definition zero. Average RATIO_NUM and RATIO_HOR suggest that firms frequently use numerical and horizon content in CSR reports

The table below reports Pearson (Spearman) correlations of the six components below (above) the diagonal. *, **, *** show statistical significances at the 10, 5, and 1% levels, respectively.

	RATIO_ OPT	RATIO_ PES	SMOG	RES WORDS	RATIO_ NUM	RATIO_ HOR
RATIO_OPT		0.10***	0.01	−0.10***	−0.07**	0.20***
RATIO_PES	0.90***		0.02	0.20***	0.20***	0.20***
SMOG	−0.10***	−0.10***		0.03	0.10***	0.08***
RESWORDS	−0.07***	0.02	−0.00		0.10***	0.10***
RATIO_NUM	0.40***	0.40***	−0.03	−0.06**		0.40***
RATIO_HOR	0.40***	0.40***	−0.05*	−0.05*	0.80***	

RATIO_OPT and RATIO_PES are positively correlated. RATIO_OPT is negatively correlated with both RESWORDS and RATIO_NUM, whereas RATIO_PES is positively correlated with both components. This indicates that, in contrast to pessimistic tone, optimistic tone is less supported by other aspects of DSCORE. RESWORDS and SMOG have zero correlation by design. RATIO_NUM and RATIO_HOR are positively correlated, suggesting that companies strategize in making more credible disclosures. In general, we observe positive, albeit at times insignificant, correlations among the aspects, indicating that these aspects likely capture a common construct of disclosure score

Computing DSCORE

DSCORE: The sum of decile ranks (scaled between 0.1 and 1) of RATIO_PES, RESWORDS, RATIO_NUM, RATIO_HOR, and inverse decile ranks (scaled between 0.1 and 1) of RATIO_OPT and SMOG.

DSCORE ranges between 0.6 and 6. We define the following indicator variables using DSCORE:

LowDSCORE: Indicator variable that is one if DSCORE is less than 3.3 (sample median).

MidDSCORE: Indicator variable that is one if DSCORE is greater than or equal to 3.3 and less than or equal to 3.9 (75th percentile of the sample).

HighDSCORE: Indicator variable that is one if DSCORE is greater than 3.9.

LowRATIO_HOR: Indicator variable that is one if RATIO_HOR is less than or equal to the 75th percentile of the sample.

HighRATIO_HOR: Indicator variable that is one if RATIO_HOR is greater than the 75th percentile of the sample.

LowRATIO_NUM: Indicator variable that is one if RATIO_NUM is less than or equal to the 75th percentile of the sample.

HighRATIO_NUM: Indicator variable that is one if RATIO_NUM is greater than the 75th percentile of the sample.

LowRESWORDS: Indicator variable that is one if RESWORDS is less than or equal to the 75th percentile of the sample.

HighRESWORDS: Indicator variable that is one if RESWORDS is greater than the 75th percentile of the sample.

LowRATIO_PES: Indicator variable that is one if RATIO_PES is less than or equal to the 75th percentile of the sample.

HighRATIO_PES: Indicator variable that is one if RATIO_PES is greater than the 75th percentile of the sample.

LowRATIO_OPT: Indicator variable that is one if RATIO_OPT*(−1) is less than or equal to the 75th percentile of the sample.

HighRATIO_OPT: Indicator variable that is one if RATIO_OPT*(−1) is greater than the 75th percentile of the sample.

LowSMOG: Indicator variable that is one if SMOG*(−1) is less than or equal to the 75th percentile of the sample.

HighSMOG: Indicator variable that is one if SMOG*(−1) is greater than the 75th percentile of the sample.

Defining 10-K Disclosure Variables

We control for narrative features of 10-K reports. This required us obtain 10-K reports for firm-years with non-missing CSR reports and define the following narrative features of the 10-K reports below:

10KRATIO_OPT: Number of financial positive words divided by the number of words in the 10-K report (Loughran and McDonald 2011).

10KOPT: Decile rank of 10KRATIO_OPT, between 0.1 and 1.

10KRATIO_PES: Number of financial negative words divided by the number of words in the 10-K report (Loughran and McDonald 2011).

10KPES: Decile rank of 10KRATIO_PESS, between 0.1 and 1.

10KSMOG: Smog index of the 10-K report.

10KREADABLE: Inverse decile rank of 10KSMOG, between 0.1 and 1.

10KWORDS: Logarithm of total number of words in the 10-K report.

10KRESWORDS: The residual from the regression 10KLOGWORDS = α + β*10KSMOG + ε, which is estimated for each year and Fama and French (1997) industry.

10KLONG: Decile rank of 10KRESWORDS, between 0.1 and 1.

Examples

Year	Company	Inverse decile rank RATIO_OPT	Decile rank RATIO_PES	Inverse decile rank SMOG	Decile rank RESWORDS	Decile rank RATIO_ NUM	Decile rank RATIO_ HOR	DSCORE
High DSCORE								
2010	United Technologies	0.8	1	1	1	1	1	5.8
2005	Newmont Mining	0.9	1	0.8	1	0.8	0.8	5.3
2005	IBM	0.9	0.7	1	1	0.9	0.7	5.2
2008	UPS	0.7	0.6	0.9	1	0.9	1	5.1
2003	Parker-Hannifin	0.9	1	0.8	0.5	0.9	0.9	5.0
Mid DSCORE								
2001	IBM	0.5	0.7	0.7	1	0.8	0.2	3.9
2002	Ford Motor	0.4	0.7	0.3	1	0.6	0.9	3.9
2002	P&G	0.2	0.6	0.9	0.5	1	0.7	3.9
2005	Starbucks	0.5	0.3	0.8	1	0.5	0.8	3.9
2007	OfficeMax	0.8	0.4	1	0.7	0.8	0.2	3.9
Low DSCORE								
2000	Halliburton	0.1	0.9	0.4	0.5	0.4	0.9	3.2
2002	Home Depot	0.1	0.4	0.8	0.7	0.4	0.8	3.2
2002	Intel	0.1	0.5	0.4	0.8	0.7	0.7	3.2
2003	Kimberly Clark	0.4	0.5	0.3	0.3	0.7	1	3.2
2004	Coca Cola	0.8	0.5	0.3	0.7	0.6	0.3	3.2

Appendix 2: Variable Definitions

CSR report variables	
CSRREPORT	An indicator variable that is one if the firm issued a corporate social responsibility (CSR) report in a given year
SubsLow(Mid)[High] DSCORE	An indicator variable that is one if the firm-year is in the Low(Mid)[High] CSR reporting disclosure score group for the second year in a row
FirstCSR	An indicator variable that is one if the CSR report is the first CSR report of the firm
FirstLow(Mid)[High] DSCORE	An indicator variable that is one if the first firm-year observation with a CSR report is in the Low(Mid)[High] DSCORE group
KLD rating variables	
KLDSTRENGTH	CSR Strength score issued by KLD for the main categories of community, employee relations, environment, human rights, product, and diversity
KLDCONCERN	CSR Concern score issued by KLD for the main categories of community, employee relations, environment, human rights, product, and diversity
Analyst forecast variables	
FERROR(X)	The average absolute value of all forecast errors, multiplied by 100 and scaled by the stock price at the beginning of the year. $X = 0,1,2$ stand for contemporaneous, one-year ahead and two-year ahead forecasts, respectively
DISPERSION	The standard deviation of analyst forecasts for current year earnings, divided by the year-end stock price

Control variables	
AGE	Natural logarithm of the number of years since a firm's first appearance in CRSP
ANALYST	Number of analysts following the firm in a given year
ASSURANCE	An indicator variable that is one if the CSR report is audited by an external auditor
BLUE STATE	An indicator variable that is one if the firm's headquarter is located in a blue state. A state is defined as a blue state if the state is carried by the Democratic Party in at least three of four presidential elections in 2000, 2004, 2008 and 2012
CAPX	The level of capital expenditures scaled by total assets
DJINDEX	An indicator variable that is one if the firm is included in the Dow Jones Sustainability Index. The coverage period of this data is 2002–2008. For years 2000 and 2001, we assume the same firms in 2002 are included in the index. For years 2009 through 2011, we assume the same firms in 2008 are included in the index
FFIN	Measure of financial transparency based on industry-year-adjusted scaled accruals. Scaled accruals are calculated as the absolute value of a firm's accruals averaged over the past three years scaled by total assets of the last year. Scaled accruals are computed as follows: $\Delta CA - \Delta CL - \Delta CASH + \Delta STD - DEP + \Delta TP$, where ΔCA (ΔCL) is change in total current assets (liabilities); $\Delta CASH$ is change in cash; ΔSTD is change in the current portion of long-term debt; DEP is depreciation and amortization expense; and ΔTP is change in income taxes payable. FFIN takes the value of 1 if a firm has higher than industry-year mean of scaled accruals, and 0 otherwise (Bhattacharya et al. 2003)
FHORIZON	Forecast horizon, calculated as the median number of days between analyst forecasts and earnings announcement
GREEN	Newsweek Magazine's green ranking based on environmental impact, initiation of green policies, and reputation. This rating, which is between 1 and 100, is available for 500 large firms. We assume the minimum score for firms that do not have Newsweek green rating
LEV	Long-term debt scaled by total assets
LOSS	Indicator variable that is one if the firm reports negative earnings at year end
MILLS	The inverse Mills ratio from the first-stage probit model as described in Appendix 3. It is used to control for the selection bias, i.e., the decision to publish a standalone CSR report
MKTSHARE	The firm's fraction of sales in its Fama and French (1997) 48 industry
R&D	Research and development expenditures scaled by total sales
RELIGIOUS	Religion ranking of the state in which the firm's headquarters is located, which ranges between 1 and 51. The ranking is based on the ratio of the number of religious adherents in the firm's state to the total population in that state in 2000 (The Association of Religion Data Archive)
ROA	Net income scaled by lagged total assets
ROAVOL	Earnings volatility, computed as the standard deviation of previous five years' ROA. At least three non-missing annual observations are required to calculate earnings volatility
SIZE	Natural logarithm of firm size, computed as common shares outstanding multiplied by fiscal year-end price
Alternative CSR report disclosure scores	
KLD_REPORT STRENGTH	An indicator variable that is one if KLD evaluates a firm's reporting on social responsibility (CSR)/sustainability efforts to be high. Factors affecting this evaluation include, but are not limited to, the completeness and specificity of a firm's reporting, setting of specific goals for CSR efforts, and quantitative measurement of progress toward these goals. The strength indicator shows that the company is particularly effective in reporting on a wide range of social and environmental performance measures, or is exceptional in reporting on one particular measure
KLD_REPORT CONCERN	An indicator variable that is one if KLD evaluates a firm's reporting on social responsibility (CSR)/sustainability efforts to be low. Factors affecting this evaluation include, but are not limited to, the completeness and specificity of a firm's reporting, setting of specific goals for CSR efforts, and quantitative measurement of progress toward these goals. The concern indicator shows that the company is distinctly weak in reporting on a wide range of social and environmental performance measures
GRI	An indicator variable that is one if the CSR Report follows the GRI reporting format

Appendix 3: Self-Selection

DSCOREs can only be defined in companies with CSR reports. Several factors—some unobservable—determine a firm's decision to provide CSR reports (Dhaliwal et al. 2012). If unaccounted for, these factors could lead to erroneous conclusions about the relationship between DSCORE and analyst forecast accuracy. We address this selection issue by using the Heckman (1979) procedure. Following Dhaliwal et al. (2012), we estimate the following first-stage probit model of a firm's decision to issue a CSR report in a year:

	P(CSRREPORT = 1)	
	Coefficient	z-stat
BLUE STATE	0.06	0.67
RELIGIOUS	−0.00	−0.85
DJINDEX	0.91***	6.17
GREEN	0.01***	4.72
ANALYST	−0.00	−0.07
SIZE	0.40***	8.54
ROAVOL	−2.00***	−2.70
FFIN	0.09	0.63
LEV	0.13	0.58
ROA	−1.17***	−3.03
R&D	0.28	0.37
CAPX	−0.82	−0.96
AGE	0.31***	6.04
MKTSHARE	2.06	1.22
Year and industry fixed effects	Yes	
Pseudo R^2	48.1%	
Observations	23,847	

The variables are defined in Appendix 2. Robust z-statistics clustered at the firm level are reported next to the coefficient estimates. *, **, *** indicate statistically significant coefficient estimates at 10, 5, and 1% levels. Following Deng et al. (2013), we use BLUE STATE and RELIGIOUS as instruments because they are likely to capture a firm's attitude toward CSR activities, and still they are unlikely to be related to analysts' forecast accuracy. Following Dhaliwal et al. (2012), we include DJINDEX and GREEN as additional instruments because they are likely to capture the firm's CSR performance. Firms with better social performance are more likely to make disclosures to differentiate themselves from other companies and gain competitive advantage. These instruments represent unobservable factors that are likely to be correlated with the firms' decision to provide CSR disclosures. The coefficient estimates are consistent with Dhaliwal et al. (2012), with the exception of ROA. We find a negative association between ROA and the likelihood of issuing CSR reports, while Dhaliwal et al. (2012) find a positive association. We calculate the inverse Mills ratio (MILLS) from the first-stage model and use MILLS as an additional control variable in the subsequent empirical tests to control for the factors that lead to firm's decision to provide CSR reports.

References

Atiase, R. K. (1985). Predisclosure information, firm capitalization, and security price behavior around earnings announcements. *Journal of Accounting Research, 23*(1), 21–36.

Ball, R., Kothari, S. P., & Robin, A. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics, 29*(1), 1–51.

Barron, O. E., Kim, O., Lim, S. C., & Stevens, D. E. (1998). Using analysts' forecasts to measure properties of analysts' information environment. *The Accounting Review, 73*(4), 421–433.

Barron, O. E., Stanford, M. H., & Yu, Y. (2009). Further evidence on the relation between analysts' forecast dispersion and stock returns. *Contemporary Accounting Research, 26*(2), 329–357.

Beretta, S., & Bozzolan, S. (2008). Disclosure score versus quantity: The case of forward-looking disclosure. *Journal of Accounting, Auditing and Finance, 23*(3), 333–375.

Beyer, A., Cohen, D. A., Lys, T. Z., & Walther, B. R. (2010). The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics, 50,* 296–343.

Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity. *The Accounting Review, 78*(3), 641–678.

Botosan, C. A. (2004). Discussion of a framework for the analysis of firm risk communication. *The International Journal of Accounting, 39,* 289–295.

Brown, T. J., & Dacin, P. A. (1997). The company and the product: Corporate associations and consumer product responses. *Journal of Marketing, 61*(1), 68–84.

Brown, W., Helland, E., & Smith, J. (2006). Corporate philanthropic practices. *Journal of Corporate Finance, 12*(5), 855–877.

Bryan, S. H. (1997). Incremental information content of required disclosures contained in management discussion and analysis. *The Accounting Review, 72*(2), 285–301.

Campopiano, G., & De Massis, A. (2015). Corporate social responsibility reporting: A content analysis in family and non-family firms. *Journal of Business Ethics, 129,* 511–534.

Casey, R. J., & Grenier, J. H. (2015). Understanding and contributing to the enigma of corporate social responsibility (CSR) assurance in the United States. *Auditing: A Journal of Practice and Theory, 34*(1), 97–130.

Chatterji, A. K., Levine, D. I., & Toffel, M. W. (2009). How well do social ratings actually measure corporate social responsibility? *Journal of Economics and Management Strategy, 18*(1), 125–169.

Chen, L., Srinidhi, B., Tsang, A., & Yu, W. (2016). Audited financial reporting and voluntary disclosure of corporate social responsibility reporting. *Journal of Management Accounting Research, 28*(2), 53–76.

Cheng, B., Ioannou, I., & Serafeim, G. (2013). Corporate social responsibility and access to finance. *Strategic Management Journal, 35*(1), 1–23.

Cheng, M. M., Green, W. J., & Ko, J. C. (2015). The impact of strategic relevance and assurance of sustainability indicators on investors' decision. *Auditing: A Journal of Practice and Theory, 34*(1), 131–162.

Cho, C. H., Patten, D. M., & Roberts, R. W. (2006). Corporate political strategy: An examination of the relation between political expenditures, environmental performance, and environmental disclosure. *Journal of Business Ethics, 67*(2), 139–154.

Cho, C. H., Robberts, R. W., & Patten, D. M. (2010). The language of US corporate environmental disclosures. *Accounting, Organizations and Society, 35,* 431–443.

Christensen, D. M. (2016). Corporate accountability reporting and high-profile misconduct. *The Accounting Review, 91*(2), 377–399.

Cohen, J., & Simnett, R. (2014). CSR and assurance services: A research agenda. *Auditing: A Journal of Practice and Theory, 34*(1), 59–74.

CSR Europe, Deloitte, and Euronext. (2003). *Investing in responsible business. The 2003 survey of European fund managers, financial analysts and investor relations officers*. CSR Europe and Deloitte.

Davis, A. K., Piger, J. M., & Sedor, L. M. (2012). Beyond the numbers: Measuring the information content of earnings press release language. *Contemporary Accounting Research, 29*(3), 845–868.

Davis, A. K., & Tama-Sweet, I. (2012). Managers' use of language across alternative disclosure outlets: Earnings press releases versus MD&A. *Contemporary Accounting Research, 29*(3), 804–837.

Dawkins, C., & Fraas, J. W. (2011). Coming clean: The impact of environmental performance and visibility on corporate climate change disclosure. *Journal of Business Ethics, 100*(2), 303–322.

Deng, X., Kang, J., & Low, B. S. (2013). Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics, 110*(1), 87–109.

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review, 86*(1), 59–100.

Dhaliwal, D. S., Radhakrishnan, S., Tsang, A., & Yang, Y. G. (2012). Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *The Accounting Review, 87*(3), 723–759.

Dichev, I. D., & Tang, V. W. (2009). Earnings volatility and earnings predictability. *Journal of Accounting and Economics, 47*(1, 2), 160–181.

Diether, K., Malloy, C., & Scherbina, A. (2002). Differences of opinion and the cross section of stock returns. *Journal of Finance, 57*(5), 2113–2141.

Dische, A. (2002). Dispersion in analyst forecasts and the profitability of earnings momentum strategies. *European Financial Management, 8*(2), 211–228.

Edmans, A. (2011). Does the stock market fully value intangibles? Employee satisfaction and equity prices. *Journal of Financial Economics, 101*(3), 621–640.

Elliott, W. B., Jackson, K. E., Peecher, M. E., & White, B. J. (2014). The unintended effect of corporate social responsibility performance on investors' estimated of fundamental value. *The Accounting Review, 89*(1), 275–302.

Elsbach, K. D., & Sutton, R. I. (1992). Acquiring organizational legitimacy through illegitimate actions: A marriage of institutional impression management theories. *Academy of Management Journal, 35*(4), 699–738.

Fama, E. F., & French, K. R. (1997). Industry costs of equity. *Journal of Financial Economics, 43*, 153–193.

Feldman, R., Govindaraj, S., Livnat, J., & Segal, B. (2010). Management's tone change, post earnings announcement drift and accruals. *Review of Accounting Studies, 15*(4), 915–953.

Garmong, S. (2007). *Management discussion and analysis in accountants' handbook, volume one: Financial accounting and general topics*. New Jersey: Wiley.

Global Reporting Initiative [GRI]. (2002). *Sustainability reporting guidelines*. Amsterdam: GRI.

Goss, A., & Roberts, G. S. (2011). The impact of corporate social responsibility on the cost of bank loans. *Journal of Banking and Finance, 35*(7), 1794–1810.

Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica, 47*(1), 153–161.

Hillman, A. J., & Keim, G. D. (2001). Shareholder value, stakeholder management, and social issues: What's the bottom line? *Strategic Management Journal, 22*(2), 125–139.

Hobson, J. L., & Kachelmeier, S. J. (2005). Strategic disclosure of risky prospects: A laboratory experiment. *The Accounting Review, 80*(3), 825–846.

Holder-Webb, L., Cohen, J., Nath, L., & Wood, D. (2009). The supply of corporate social responsibility disclosures among U.S. firms. *Journal of Business Ethics, 84*(4), 497–527.

Hope, O. (2003). Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. *Journal of Accounting Research, 41*(2), 235–272.

Huang, X., Nekrasov, A., & Teoh, S. H. (2013). *Headline salience and over- and underreactions to earnings*. Working paper, California State University, University of California-Irvine.

Hughes, J. S., & Pae, S. (2004). Voluntary disclosure of precision information. *Journal of Accounting and Economics, 37*(2), 261–289.

Hummel, K., & Schlick, C. (2015). *The relationship between sustainability performance and sustainability disclosure—Hard numbers beat smooth talk*. Working paper.

Hussainey, K., Schleicher, T., & Walker, M. (2003). Undertaking large-scale disclosure studies when AIMR-FAF rating are not available: The case of prices leading earnings. *Accounting and Business Research, 33*(4), 275–294.

Hussainey, K., & Walker, M. (2009). The effects of voluntary disclosure and dividend propensity on prices leading earnings. *Accounting and Business Research, 39*(1), 37–55.

Ijiri, Y. (1965). *Management goals and accounting for control*. Amsterdam: North Holland Publication Company.

Ingram, R. W., & Frazier, K. B. (1980). Environmental performance and corporate disclosure. *Journal of Accounting Research, 18,* 614–622.

Ioannou, I., & Serafeim, G. (2012). What drives corporate social performance? The role of nation-level institutions. *Journal of International Business Studies, 43*(9), 834–864.

Katz, S. L. (2001). Videoconferencing with the French-speaking world: A user's guide. *Foreign Language Annals, 34*(2), 152–157.

Kim, Y., Park, M., & Wier, B. (2012). Is earnings disclosure score associated with corporate social responsibility? *The Accounting Review, 87*(3), 761–796.

King, R., Pownall, G., & Waymire, G. (1990). Expectations adjustments via timely management forecasts: Review, synthesis, and suggestions for future research. *Journal of Accounting Literature, 9*(1), 113–144.

Kothari, S. P., Li, X., & Short, J. E. (2009a). The effect of disclosures by management, analysts, and business press on cost of capital, return volatility, and analyst forecasts: A study using content analysis. *The Accounting Review, 84*(5), 1639–1670.

Kothari, S. P., Shu, S., & Wysocki, P. (2009b). Do managers withhold bad news? *Journal of Accounting Research, 47*(1), 241–276.

Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review, 86*(3), 1087–1115.

Lev, B., Petrovits, C., & Radhakrishnan, S. (2010). Is doing good good for you? How corporate charitable contributions enhance revenue growth. *Strategic Management Journal, 31*(2), 182–200.

Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes, 76*(2), 149–188.

Li, F. (2008). Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics, 45*(2, 3), 221–247.

Li, F. (2010a). The information content of forward-looking statements in corporate filings—A naïve Bayesian machine learning approach. *Journal of Accounting Research, 48*(5), 1049–1102.

Li, F. (2010b). Textual analysis of corporate disclosures: A survey of the literature. *Journal of Accounting Literature, 29,* 143–165.

Loughran, T., & McDonald, B. (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *Journal of Finance, 66*(1), 35–65.

Loughran, T., & McDonald, B. (2014). Measuring readability in financial disclosures. *Journal of Finance, 69*(4), 1643–1671.

Lundholm, R., Rogo, R., & Zhang, J. (2014). Restoring the tower of Babel: How foreign firms communicate with US investors. *The Accounting Review, 89*(4), 1453–1485.

Lys, T., Naughton, P., & Wang, C. (2015). Signaling through corporate accountability reporting. *Journal of Accounting and Economics, 60,* 56–72.

Lys, T., & Soo, L. (1995). Analysts' forecast precision as a response to competition. *Journal of Accounting, Auditing and Finance, 10*(4), 751–765.

Margolis, J. D., & Walsh, J. P. (2003). Misery loves companies: Rethinking social initiatives by business. *Administrative Science Quarterly, 48*(2), 268–305.

Matsumura, E. M., Prakash, R., & Vera-Munoz, S. C. (2014). Firm-value effects of carbon emissions and carbon disclosures. *The Accounting Review, 89*(2), 695–724.

Mishra, D. R. (2015). Post-innovation CSR performance and firm value. *Journal of Business Ethics,* 1–22. doi:10.1007/s10551-015-2676-3.

Mishra, D. R., & Modi, S. B. (2013). Positive and negative corporate social responsibility, financial leverage, and idiosyncratic risk. *Journal of Business Ethics, 117,* 431–448.

Morris, M. W., Sheldon, O. J., Ames, D. R., & Young, M. (2007). Metaphors and the market: Consequences and preconditions of agent and object metaphors in stock market commentary. *Organizational Behavior and Human Decision Processes, 102*(2), 174–192.

Muslu, V., Radhakrishnan, S., Subramanyam, K. R., & Lim, D. (2015). Forward-looking MD&A disclosures and the information environment. *Management Science, 61*(5), 931–948.

O'Brien, P. (1990). Forecast accuracy of individual analysts in nine industries. *Journal of Accounting Research, 28*(2), 286–304.

Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate social and financial performance: A meta-analysis. *Organization Studies, 24*(3), 403–441.

Perego, P., & Kolk, A. (2012). Multinationals' accountability on sustainability: The evolution of third-party assurance of sustainability reports. *Journal of Business Ethics, 110*(2), 173–190.

Perrini, F. (2005). Building a European portrait of corporate social responsibility reporting. *European Management Journal, 23*(6), 611–627.

Pflugrath, G., Roebuck, P., & Simnett, R. (2011). Impact of assurance and assurer's professional affiliation on financial analysts' assessment of credibility of corporate social responsibility information. *Auditing: A Journal of Practice and Theory, 30*(3), 239–254.

Plumlee, M., Brown, D., Hayes, R. M., & Marshall, S. (2014). Voluntary environmental disclosure score and firm value: Further evidence. *Journal of Accounting and Public Policy, 34*(4), 336–361.

Ramanna, K. (2013). A framework for research on corporate accountability reporting. *Accounting Horizons, 27*(2), 409–432.

Roberts, P. W., & Dowling, G. R. (2002). Corporate reputation and sustained superior financial performance. *Strategic Management Journal, 23*(12), 1077–1093.

Schleicher, T., Hussainey, K., & Walker, M. (2007). Loss firms' annual report narratives and share price anticipation of earnings. *The British Accounting Review, 39*(2), 153–171.

Securities and Exchange Commission (SEC). (1989). *Financial reporting release no. 36. Management's discussion and analysis of financial condition and results of operations: certain investment company disclosures.* Securities Act Release No. 33-6835. Washington, DC: SEC.

Securities and Exchange Commission (SEC). (2003). *Financial reporting release no. 72. Commission guidance regarding management's discussion and analysis for financial condition and results of operations.* Securities Act Release No. 33-8350. Washington, DC: SEC.

Sethi, S. P., Martell, T. F., & Demir, M. (2015). An evaluation of the quality of corporate social responsibility reports by some of the world's largest financial institutions. *Journal of Business Ethics,* 1–19. doi:10.1007/s10551-015-2878-8.

Simnett, R., Vanstraelen, A., & Chua, W. (2009). Assurance on sustainability reports: An international comparison. *The Accounting Review, 84*(3), 937–967.

Starks, L. T. (2009). Corporate governance and corporate social responsibility: What do investors care about? What should investors care about? EFA keynote speech. *The Financial Review, 44*(4), 461–468.

Waddock, S. A., & Graves, S. B. (1997). The corporate social performance-financial performance link. *Strategic Management Journal, 18*(4), 303–319.

Werther, W. B., Jr., & Chandler, D. (2006). *Strategic corporate social responsibility*. Thousand Oaks, CA: Sage Publications.

Wiseman, J. (1982). An evaluation of environmental disclosures made in corporate annual reports. *Accounting, Organizations and Society, 7*(1), 53–63.