Measuring Corporate Social Responsibility Report Quality

Using Narratives

Abstract

Corporate Social Responsibility (CSR) reports vary considerably in their quality largely due to their voluntary nature and the lack of an accountability framework in CSR reporting. We develop a CSR report quality measure using the tone, readability, length, numerical content, and horizon content of the reports' narratives. We find that our quality measure is positively associated with CSR performance ratings and CSR transparency ratings issued by KLD database as well as equity analysts' earnings forecast accuracy. These findings validate our quality measure by linking it with the information content of CSR reports, and demonstrate its potential to provide a framework for measuring CSR report quality.

Keywords: Corporate social responsibility, KLD ratings, textual disclosures, analyst forecasts.

1. Introduction

Firms have increasingly been disclosing their social responsibility activities in stand-alone reports.[1] According to the Corporate Register, which tracks corporate social responsibility (CSR) reports worldwide, only a handful of U.S. firms published stand-alone CSR reports before 1995. This number increased to 375 in 2010. Recent research documents significant capital market benefits associated with CSR reports such as reduced cost of equity capital and improved analyst forecast accuracy (Dhaliwal et al. 2011, 2012). In this paper, we use narratives in CSR reports to develop a measure of CSR report quality. We then validate this measure using its association with CSR performance ratings and analyst forecast accuracy. Developing a measure of CSR report quality is important, because CSR reports lack an accountability framework and thus vary considerably in content and format (Ramanna 2013).

Our notion of CSR report quality is based on the informativeness of narratives in the CSR report. Prior research shows various aspects of financial narratives to be informative to users and/or associated with future performance (Li 2010a, 2010b), such as (inverse) optimism, pessimism, readability, length, numerical content, and horizon content. Capitalizing on these findings, we consider CSR reports to be of higher quality if they have fewer optimistic and more pessimistic keywords; if they are more easily readable; if they are longer; and if they have more numerical and horizon content. We aggregate these aspects into a composite rank measure of CSR report quality for each firm-year observation.

We first validate the composite measure of CSR report quality using its association with CSR Strength and Concern ratings issued by the KLD. KLD ratings have been extensively used in the economics and strategic management literatures (Kotchen and Moon 2012; Waddock and

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[1] Practitioners and academicians name these reports differently, e.g., (corporate) sustainability reports (Ioannou and Serafeim 2012; Simnett et al. 2009); corporate accountability reports (Ramanna 2013); and corporate responsibility reports (Corporate Register). Appendix 2 provides examples about the content of CSR reports.

Graves 1997; Ioannou and Serafeim 2012) and have been shown to reliably measure CSR performance (Chaterji et al. 2009; Szwajkowski and Figlewicz 1999). We predict that CSR report quality is associated with *both* Strength and Concern ratings, after controlling for the known determinants of the ratings and self-selection. This is because KLD uses all publicly available information including the CSR reports in order to determine the ratings (Kim et al. 2012). As such, high-quality CSR reports are likely to be more informative about (i.e., more strongly relate with) both the Strength and Concern ratings.

There is strong empirical support for this prediction. Both KLD Strength and Concern ratings are positively associated with CSR report quality.[2] Going from Low to Mid and from Mid to High CSR report quality improves the Strength ratings by 13% and 24% respectively, indicating that improvements in Strength ratings increase with the quality measure. Similarly, going from Low to Mid and from Mid to High CSR report quality improves the Concern ratings by 29% and 27% respectively, indicating that improvements in Concern ratings increase in a linear fashion. Particularly, the findings on Concern ratings suggest that our measure captures the quality of the information contained in the reports.

Dhaliwal et al. (2012) show that the incidence of CSR reports is associated with analyst forecast accuracy. As a natural extension, we validate the CSR report quality using its association with analyst forecast accuracy for the current year, one-year-ahead, and two-year-ahead earnings. We document the following results. The average analyst forecast accuracy for all years is statistically similar between firms with low-quality CSR reports and firms with no CSR reports. The average forecast accuracy for the current year and one-year-ahead earnings is higher for firms with mid-quality CSR reports than firms with no CSR reports. The average forecast

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[2] We find similar results using a propensity score matched control sample.

accuracy for all three years is higher for firms with high-quality CSR reports than firms with no CSR reports. Overall, analyst forecast accuracy increases with CSR report quality.

We then examine whether it is the style or the amount of CSR disclosure that drives these associations. The optimism, pessimism, and readability aspects of the report quality capture the "Style" dimension; whereas the length, numerical content, and horizon content aspects capture the "Amount" dimension. We find that while both dimensions have discriminating power compared to the control group of firms with no CSR reports, the content dimension drives the association with CSR performance ratings, and the style dimension drives the association with forecast accuracy.

CSR reports are likely to be sticky in style and content. If our results are driven by the first CSR report, then they could be more reasonably attributable to some unobserved company characteristics that are associated with CSR report quality, CSR performance, and analyst accuracy. In contrast, we find that both the first and subsequent CSR reports are associated with CSR performance ratings and analysts' forecast accuracy. This provides additional validity to our measure of CSR report quality.

Finally, we examine the associations between our quality measure, propensity of firms that use the GRI framework in CSR reports, and firms' CSR reporting quality ratings that are issued by KLD. We find that 4.4%, 31.5% and 53.4% of firms that we classify as Low, Mid, and High quality CSR reports respectively follow the GRI reporting format. Similarly, KLD rates as transparent 10.3%, 20.1% and 41.1% of firms that we classify as Low, Mid and High quality CSR reports, respectively. These associations provide additional validity to our measure of CSR report quality. Note that the GRI guidelines mostly focus on the form but not the substance of the disclosures. Furthermore, how KLD rates CSR reporting quality is not fully known. In contrast,

our measure is transparent; is based on an objective set of CSR disclosure aspects; and is therefore replicable. In addition, we find that our measure continues to be associated with CSR performance ratings and analysts' forecast accuracy, even after we control for these alternative quality measures.

Our study contributes to the literature in several ways. First, we develop and validate a measure of CSR report quality based on various aspects of textual disclosures. Future studies can use this composite measure to explore the quality of narratives in different contexts. Second, our tests extend research on CSR reporting. We show that not only the decision to issue a CSR report but also the decision to disclose high-quality narratives impacts users' assessments of CSR activities and bring capital market benefits. This contribution is especially important given that CSR reports lack a standard and enforceable accountability framework and their content is largely voluntary (Ramanna 2013). Finally, our evidence adds to the empirical evidence of voluntary disclosure literature, which documents capital market benefits of corporate transparency in various contexts such as financial report quality and relations with stakeholders.

The next section discusses the related literature. Section 3 develops the CSR report quality measure and provides descriptive statistics for the measure. Section 4 examines the association of the CSR report quality measure with CSR performance ratings and analysts' forecast accuracy. Section 5 provides tests on different dimensions of our measure; first and repeat CSR reports; and alternative measures of CSR report quality. Section 6 concludes.

2. Background

The objective of this study is to develop and validate a quality measure for CSR report narratives. We use research on narratives in financial statement reports to develop insights for the measure; and we use research on capital market benefits of CSR reports to validate the

measure. As such, our study is at the intersection of the literatures on capital market benefits of CSR-related disclosures and textual disclosures in financial statement reports.

2.1. Disclosures on Corporate Social Responsibility Activities

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.[3] In their meta-analyses of large numbers academic studies, Orlitzky et al. (2003) and Margolis and Walsh (2003) find a positive association between CSR performance and financial performance. CSR activities likely enhance financial performance through various channels such as 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 engaging in less earnings management (Kim et al. 2012). This widely-documented link between CSR performance and financial performance suggests that CSR disclosures would provide useful information to investors about future firm performance from CSR disclosures. Consistent with this notion and voluntary disclosure theories, recent literature documents capital market benefits to publishing CSR reports. For example, Dhaliwal et al. (2011) show that the initiation of CSR reports by U.S. firms that have superior CSR activities reduces cost of equity capital as well as analyst forecast errors. Using an international setting, Dhaliwal et al. (2012) further show that the presence of CSR reports is associated with lower forecast errors for firms around the world.

2.2. Textual Disclosures in Financial Reports

The developments in computational linguistics have bolstered research on textual

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[3] Source: World Business Council for Sustainable Development, which is a CEO-led, global association of about 200 large international companies dealing exclusively with business and sustainable development.

disclosures (Li 2010b). One stream of research examines informativeness of financial narratives in statements. Kothari et al. (2009a) find that favorable (unfavorable) disclosures from the company, analysts, and business press are associated with lower (higher) firm risk as measured by the cost of capital, return volatility, and analyst forecast dispersion. Li (2010) finds that tone of forward-looking statements in Management and Discussion Analysis (MD&A) sections of 10-K and 10-Q reports is associated with future performance and mitigates the accrual anomaly. Feldman et al. (2010) find that changes in MD&A tone are associated with returns around the filing dates. Loughran and McDonald (2011) show that pessimistic tone in 10-K and 10-Q reports is associated with negative market reactions around the filing dates. Davis et al. (2012) show that tone in earnings announcements is associated with future performance and short-term returns. Collectively, investors appear to react to the optimistic and pessimistic narratives in financial statements and business press, indicating that both optimistic and pessimistic tones are informative about future performance. However, investors react differently to optimistic and pessimistic narratives, suggesting that investors recognize firms' incentives to positively skew their disclosure.

Another stream of research focuses on obfuscation incentives of managers. Firms that publish less readable financial reports have poor performance and less persistent profits (Li 2008), suggesting that managers obfuscate information when they have higher incentives to do so. Lehavy et al. (2011) show that less readable financial reports are associated with greater analyst forecast dispersion and lower forecast accuracy. Loughran and McDonald (2011) compares the value relevance of different measures of readability of financial reports in order to validate these measures. Collectively, this evidence shows that less readable financial reports are less informative to investors.

Another stream of research focuses on the content of narratives. Bryan (1997) finds that the content of MD&A narratives is associated with future financial performance. Hussainey et al. (2003), Schleicher et al. (2007), and Hussainey and Walker (2009) examine forward-looking MD&A disclosures in the U.K., and document that these disclosures are informative to the capital markets. Muslu et al. (2013) find that forward-looking information and operations-related MD&A disclosures help investors incorporate information on future performance into current stock prices. Collectively, the evidence shows that quantitative and forward-looking narratives in financial statements are informative.

2.3. Financial Report Quality versus CSR Report Quality

Managers have opportunistic incentives to affect stock prices, deter regulation and investor scrutiny, and negotiate debt and compensation contracts (Kothari et al. 2009b). Such incentives reduce informativeness of corporate disclosures in two ways. First, managers can direct attention to desirable information and deflect attention away from controversial or unacceptable information (Elsbach and Sutton 1992). Second, managers can skew the disclosure tone more positively than what is warranted (Davis and Tama-Sweet 2012).

Managers' opportunistic incentives may reduce CSR report quality more strongly than financial report quality. The financial reporting framework, which has developed over centuries, has three important characteristics (Ijiri 1965; Ramanna 2013). First, it mitigates information asymmetry between managers and investors by requiring verifiable information. Verifiability implies that financial information is auditable so that preparers can be 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, preventing managers from optimistically skewing disclosures (Ball et al. 2000). Second, the financial reporting

framework includes well-defined performance and position reports, which help firms to contract

with stakeholders (Watts and Zimmerman 1986; Kothari et al. 2010).[4] Third, it matches

managers' actions to outcomes of the actions. The financial reporting framework is enforced

through a combination of threat of litigation, external audit, and regulatory oversight. CSR

reporting lacks these characteristics despite attempts to standardize the CSR reporting and

auditing under an enforceable framework (Ramanna 2013).[5] Firms have significant discretion in

whether and how much CSR information to disclose as well as whether to have CSR reports

audited. Overall, managers' opportunistic incentives are likely to reduce CSR report quality more

severely than financial report quality. The lack of an accountability framework for CSR reporting

highlights the importance of developing a quality measure of CSR narratives.[6]

3. Developing a Measure of CSR Report Quality

Using insights from the textual analysis of financial reports (Section 2.2), we measure the

quality of narratives in the CSR report using the following aspects:

1. Tone: The way information is presented changes users' beliefs independent of content (Levin

et al. 1998; Katz 2001; Morris et al. 2007). Given managers' optimism incentives and the lack of

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[4] The primary performance report is the income statement, and provides investors with information relevant for their objective to maximize returns. The primary position report is the balance sheet, and enables investors to monitor manager's actions as well as matches managerial efforts to outcomes. Ramanna (2013) states, "Without balance sheets, financial reporting would consist solely of anachronistic performance reporting….Without position reporting, performance reporting will be untimely and, consequently, uninformative."

[5] Global Reporting Initiative (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. 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 standard CSR reporting, the auditing standards only attempt to verify processes and data collection.

[6] While a universally accepted 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 aspects of disclosure quality such as understandability, relevance, reliability, and comparability (Botosan 2004). There are some notable attempts to measure disclosure quality. 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.

an accountability framework, we assert that negative CSR information is more credible than positive CSR information. We measure the tone of CSR reports by using "financial negative" and "financial positive" word lists, which are developed by Loughran and McDonald (2011).[7] Pessimistic tone RATIO_PESS 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: Managers can make disclosures less readable in order to hide subsequent poor performance (Li 2008). Therefore, we consider readability as a component of CSR report quality. Li (2008) uses the Fog index and the length of the report as measures of readability. 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+3.1291.[8]

3. Length: CSR report length may indicate more information about CSR activity (Li 2008) and higher report quality. However, financial report length also proxies for business complexity (Li 2008). To use report length as a measure of report quality, we filter its complexity/obfuscation component. Specifically, we define RESWORDS as the residual from regressing the report length (log of the number of words in the CSR report) on SMOG.

4. Numerical content: Unlike textual information, numerical information is universally understood with precision (Lundholm et al. 2013). King et al. (1990) suggest that quantitative versus qualitative disclosures show the precision of managers' beliefs about the future (also see

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[7] These lists are widely used in the accounting and finance literature. Li (2010) suggests that alternative lists, such as Diction, General Inquirer, and the Linguistic Inquiry and Word Count, might not work well for corporate filings.
[8] We use other readability measures (Li 2008), i.e., Fog, Flesch-Kincaid, and Flesch reading ease indices, and find similar results to those reported.

Hughes and Pae 2004). Huang et al. (2012) measure news salience as the existence of numbers in the title of the earnings press release. More precise management forecasts are also positively related with superior governance (Ajinkya et al. 2005; Karamanou and Vafeas 2005) and number of analyst following (Baginski and Hassell 1997). As such, a CSR report is likely to be of higher quality if it includes more numerical information. To measure numerical content, we define RATIO_NUMERICAL 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 horizon information (Muslu et al. 2013). To measure horizon content, we define RATIO_HORIZON 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_PESS, SMOG, RESWORDS, RATIO_NUMERICAL, and RATIO_HORIZON into deciles, with RATIO_OPT and SMOG inverse ranked. We then aggregate these decile ranks into a composite measure of CSR report quality, QUALITY. CSR reports with fewer optimistic keywords, more pessimistic keywords, higher readability, more length, more numerical content, and more horizon content are assessed to be higher quality. The ranking procedure mitigates potential noise in, and enables a meaningful aggregation across, these quality aspects. We also divide QUALITY into two dimensions, one representing "Style" and the other "Amount" of the information presented. The (inverse) positive and negative tone and readability aspects relate to "Style", i.e., how the information is disseminated. The length, numerical content, and horizon content aspects related to "Amount", i.e., what information is disseminated. Appendix 1 provides details on the computation of QUALITY.

3.1. Sample

The sample consists of firms with KLD ratings from 2000 to 2009.[9] We follow Dhaliwal et al. (2011, 2012) and search for stand-alone CSR reports of these firms in the Corporate Register database, which is the leading repository of stand-alone CSR reports worldwide. There are 17,107 firm-year observations representing 3,631 firms with KLD ratings; of these 1,541 representing 341 firms publish stand-alone CSR reports. Table 1, Panel A provides the annual and industry distribution of the sample. The number of firms with KLD ratings increased six-fold from 379 in 2000 to 2,188 in 2009. Similarly, the number of firms with CSR reports increased seven-fold from 44 in 2000 to 294 in 2009. These increases attest to firms' growing emphasis on CSR activities. The percentage of KLD firms that issue CSR reports is 12% in 2000, drops to 5% in the aftermath of the market crash of 2002, and then picks up to 13% in 2009. Furthermore, firms that operate in consumer non-durables and energy industries are more likely to issue CSR reports. As such, we control for year and industry fixed effects in empirical analyses.

Table 1, Panel B provides examples of companies with differing QUALITY scores. In general, firms with High (Low) QUALITY have consistently high (low) decile ranks in many of the six aspects of CSR report quality. The correlation coefficients among the six aspects, which are tabulated in Appendix 1, support this finding. For instance, optimistic and pessimistic content as well as numerical and horizon content are significantly and positively correlated, suggesting that companies strategize in making credible disclosures. In general, we observe positive correlations among the aspects of QUALITY, suggesting that these aspects capture a common construct of quality.

Table 1, Panel C shows that the percentage of CSR reports that are classified as low, medium, and high quality are relatively constant over time at 9%, 76%, and 15%. Moreover, the

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[9] The final year is set at 2009, because some validation tests require financials of subsequent two years.

percentage of CSR reports that are classified across STYLE and AMOUNT dimensions are relatively constant over time.

4. Validating the CSR Report Quality Measure

4.1. CSR Report Quality and CSR Performance

We now proceed to validate QUALITY by relating it to CSR performance ratings. Chatterji et al. (2009) state, "Just as credit ratings enhance transparency and efficiency in debt capital markets by reducing the information asymmetry between borrowers and lenders, social ratings aim to provide social investors accurate information that makes transparent the extent to which firms' behaviors are socially responsible." As the leading certifier of CSR activities, KLD rates CSR performance of a large number of firms by using surveys, corporate reports, and news articles.[10] 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. As of 2013, these categories have a total of 124 positive or negative indicators, which are combined as strength and concern scores for the categories.[11] Szwajkowski and Figlewicz (1999) find that KLD ratings have strong internal discriminant validity, i.e., the ratings correlate with other performance metrics based on reputation and social responsibility surveys.

Prior research shows that various aspects of narratives in financial statement reports are informative to investors about future financial performance. Accordingly, we validate QUALITY, which is based on aggregating various aspects of narratives contained in the CSR

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[10] Kinder, Lydenberg, and Domini Research and Analytics (KLD) was first acquired by RiskMetrics and later by MSCI. The KLD brand name has been retained through these acquisitions.

[11] 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 quality measure and the KLD ratings. In robustness tests, we include the corporate governance dimension and find similar results.

report, by examining its association with the KLD ratings. Users of CSR reports including KLD analysts are more likely to rely on the narratives in the CSR reports if these narratives are more informative about CSR performance, i.e., if they are of higher quality. Thus, we expect firms with higher QUALITY to have higher KLD ratings.

In particular, we expect firms with higher QUALITY to have higher KLD ratings in both CSR strengths and concerns. To see this, consider a multidimensional report published by a city on the quality of life in the city. The report is likely to contain positive aspects such as business and economic development as well as negative aspects such as crime and law enforcement. The report is more likely to be more informative to users if it provides narratives on both positive and negative aspects. Thus, from an information perspective, we expect high quality CSR reports to be more informative for both strengths and concerns of the CSR activities.[12]

CSR performance ratings, KLDSTRENGTH and KLDCONCERN, are the sum of positive and negative indicators for different KLD categories. From the informativeness perspective, we expect that higher CSR report quality reports will help KLD analysts to either set or confirm their ratings for both strengths and concerns. As such, we examine the KLD Strength and Concern ratings, separately, using the OLS estimation below:

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\begin{aligned}
\text{KLDSTRENGTH or} \quad & \beta_0 + \beta_1 \, \text{LowQUALITY} + \beta_2 \, \text{MidQUALITY} + \beta_3 \, \text{HighQUALITY} \\
\text{KLDCONCERN} \;=\; & + \beta_4 \, (\text{1-10KOPT}) + \beta_5 \, \text{10KPESS} + \beta_6 \, \text{10KREADABLE} + \beta_7 \, \text{10KLONG} \\
& + \beta_8 \, \text{ANALYST} + \beta_9 \, \text{SIZE} + \beta_{10} \, \text{ROA} + \beta_{11} \, \text{LEV} + \beta_{12} \, \text{R\&D} \\
& + \beta_{13} \, \text{RETVOL} + \beta_{14} \, \text{M/B} + \beta_{15} \, \text{BUSSEG} + \beta_{16} \, \text{GEOSEG} \\
& + \beta_{17} \, \text{HERFINDEX} + \beta_{18} \, \text{MILLS} + \gamma \, \text{INDUSTRY} + \delta \, \text{YEAR} + \varepsilon
\end{aligned}
\tag{1}
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The key independent variables in Eq. (1) are indicators of LowQUALITY, MidQUALITY, and HighQUALITY. The KLD-rated companies with no CSR reports serve as benchmark in Eq. (1). The coefficient estimates for the low, medium, and high QUALITY

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[12] This information perspective also helps to provide a certain degree of confidence that the measure of CSR report quality does not capture firms that exhibit better CSR performance.

groups show the incremental effect of the respective CSR report quality when compared to companies with no CSR reports. We expect positive coefficient estimates that increase with the extent of CSR report quality, i.e., $\beta_3 > \beta_2 > \beta_1$.

We control for the company's overall disclosure style using deciles of 10-K report optimism (10K_OPT), pessimism (10K_PESS), readability (10KREADABLE), and length (10KLONG).[13] Analysts likely follow successful firms (Schipper 1991); we expect ANALYST to be positively (negatively) associated with KLD Strength (Concern). Large firms are likely to have diverse products and production processes; we expect SIZE to be positively associated with both KLD Strength and Concern. Ioannou and Serafeim (2012) find that profitability is positively associated with net KLD Strength; we expect ROA to be positively (negatively) associated with Strength (Concern). Creditors are likely to monitor leveraged firms; we expect LEV to be positively (negatively) associated with Strength (Concern). However, leveraged firms are riskier and, therefore, LEV can be negatively (positively) associated with Strength (Concern). More innovative firms are likely to have better CSR performance; we expect R&D to be positively (negatively) associated with Strength (Concern). However, R&D firms are likely to be riskier and, therefore, R&D can be negatively (positively) associated with Strength (Concern). RETVOL captures a company's idiosyncratic risk; we expect RETVOL to be negatively (positively) associated with Strength (Concern). However, RETVOL captures the liquidity and investor interest in the stock, and, therefore, RETVOL can be positively (negatively) associated with Strength (Concern). M/B is positively associated with risk (Fama and French 1993); we expect M/B to be negatively (positively) associated with Strength (Concern). However, M/B measures growth options and innovativeness (Smith and Watts 1992), and, therefore, M/B can be positively (negatively) associated with Strength (Concern). Similar to the arguments for SIZE,

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[13] We do not consider numerical and horizon disclosures in the 10-K, because part of these are mandated (e.g., tables).

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we expect BUSSEG and GEOSEG to be positively associated with both Strength and Concern. Greater competition can either provide incentives for firms to differentiate themselves with CSR activities or, in contrast, shorten their decision horizons so they do not engage in CSR activities. As such, the predicted association of HERFINDEX with both Strength and Concern is not clear. We also use an inverse Mills ratio to control for unobservable factors that relate with companies' decision to publish CSR reports (Dhaliwal et al. 2012). Appendix 3 describes the self-selection treatment in detail. Finally, we include industry and year fixed effects, because CSR reports are concentrated in some industries and exhibit an overall time trend. All variables in Eq. (1) are defined in Appendix 2.

Table 2, Panel A compares mean and median of the above variables across the no-CSR report group and the three QUALITY groups. The mean KLD Strength (Concern) are 0.83, 3.71, 4.20, and 5.20 (1.19, 2.36, 3.35, and 4.61) for the no-CSR, low, medium, and high QUALITY, respectively. Consistent with the empirical prediction based on QUALITY measuring informativeness, both Strength and Concern ratings increase with QUALITY. Moving from the low to the high quality group, the Strength rating increases by 40% [=(5.20 – 3.71)/3.71], and the Concern rating increases by 95% [=(4.61 – 2.36)/2.36]. This indicates that the CSR report quality has more discriminant power for Concern ratings than Strength ratings.

Regarding the 10-K narratives, the no-CSR report group and the three QUALITY groups do not by and large differ across the tone and readability of 10-K reports. 10-K optimism is perceptibly less than CSR report optimism. Average 10K_OPT is 5.69, whereas average RATIO_OPT of CSR reports is 15.8 (Appendix 1). Similarly, average 10K_PESS is 10.6, whereas average RATIO_PESS of CSR reports is 8.1. 10KRESWORDS increases with QUALITY, indicating that firms with long 10-K's are likely to provide long CSR reports, after

controlling for readability. Regarding firm characteristics, QUALITY is associated with various firm characteristics, showing the importance of controlling for firm characteristics in order to draw empirical inferences about the association between CSR report quality and CSR performance.

Table 2, Panel B reports results of estimating Eq. (1) with standard errors adjusted for clustering by firm. KLDSTRENGTH is the dependent variable in columns (1) and (2); and KLDCONCERN is the dependent variable in columns (3) and (4). 10-K narrative variables are not included as control variables in columns (1) and (3). We discuss the results in columns (2) and (4), which include the 10-K narrative variables. The coefficient estimates on the key independent variables are similar with and without the inclusion of these variables.

When KLD Strength (Concern) is the dependent variable, the coefficient estimates for low, medium, and high QUALITY are 3.27, 3.62, and 4.40 (1.08, 1.76, and 2.63), respectively. All coefficient estimates are positive and significant. Consistent with Panel A, both KLD Strength and Concern increase with QUALITY. Moving from the low to the high quality group increases KLD Strength by 34% [=(4.40 – 3.27)/3.27] and KLD Concern by 144% [=(2.63 – 1.07)/1.07]. Consistent with Panel A, CSR report quality appears to have more discriminant power for KLD Concern than Strength. All differences in the coefficient estimates across low, medium, and high QUALITY are statistically significant. The difference between the coefficient estimates for medium and low QUALITY is 0.34 (0.69) for KLD Strength (Concern). The difference between the coefficient estimates for high and medium QUALITY is 0.79 (0.86) for KLD Strength (Concern), suggesting that users are more sensitive to the marginal reporting

quality changes when the reporting quality is already good. This suggests a degree of non-linearity that our research design can capture.[14]

The coefficient estimates for 10-K narrative variables load significantly, validating their use as control variables for companies' overall disclosure strategy. Inverse Mills ratio also loads significantly, indicating the importance of controlling for the selection bias.

4.2. CSR Report Quality and Analyst Forecast Errors

To validate our measure from the perspective of informativeness on firm performance, we use Dhaliwal et al.'s (2012) findings that CSR reports help analysts to improve forecast accuracy. Sell-side equity analysts may find the CSR reporting useful for forecasting earnings if CSR activities affect firm value. Starks (2009) argues that CSR activities influence firm value through their effect on regulatory, supply chain, litigation, and product and technology risk. Dhaliwal et al. (2011) find that firms publishing CSR reports subsequently exhibit a lower cost of equity capital, especially when firms have higher KLD ratings. Goss and Roberts (2011) show that banks are more willing to consider soft financing for firms with a better CSR record. In contrast, firms with poorly-received CSR activities can be adversely impacted (Werther and Chandler 2006). Overall, investors benefit from information on CSR activities, and analysts likely use the information available in CSR reports to forecast financial performance. Consistent with this notion, Dhaliwal et al. (2012) find that the presence of CSR reports is positively associated with analyst forecast accuracy. Accordingly, if our measure of CSR report quality is valid, then CSR report quality must be positively associated with analysts' forecast accuracy.

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

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[14] Note that if we had used the total quality score instead of the indicators, we would have imposed linearity and estimated the marginal effect of moving from the lowest to the highest CSR report quality.

$$FERROR(X) = \beta_0 + \beta_1 \, LowQUALITY + \beta_2 \, MidQUALITY + \beta_3 \, HighQUALITY \qquad (2)$$
$$+ \beta_4 \, KLDSTRENGTH + \beta_5 \, KLDCONCERN + \beta_6 \, ANALYST + \beta_7 \, SIZE$$
$$+ \beta_8 \, ROAVOL + \beta_9 \, LOSS + \beta_{10} \, FHORIZON + \beta_{11} \, FFIN + \beta_{12} \, MILLS$$
$$+ \gamma \, INDUSTRY + \delta \, YEAR + \varepsilon$$

FERROR(X) is the absolute value of average forecast error scaled by the beginning of the year price. X has values of 0, 1, or 2, standing for current year, one-year ahead, and two-year ahead forecasts, respectively. As in Eq. (1), the coefficient estimates for the low, medium, and high quality groups captures the incremental effect of the respective CSR report quality group relative to companies with no CSR reports. We expect negative coefficient estimates that decrease with the extent of CSR report quality, consistent with the prediction that higher report quality is associated with lower forecast errors. We control for CSR performance ratings on the association between CSR report quality and analyst forecast errors. KLD Strength (Concern) should be negatively (positively) associated with analyst forecast errors if CSR performance suggests firm transparency (Kim et al. 2012). On the other hand, KLD Strength (Concern) should be positively (negatively) associated with analyst forecast errors if CSR performance suggests firms' operational complexity.

Eq. (2) uses several control variables that are likely to confound the association between CSR report quality and forecast accuracy (Hope 2003; Dhaliwal et al. 2012). Specifically, we control for analyst following (ANALYST), because greater analyst following implies stronger competition and hence higher incentives for analysts to enhance forecast accuracy (Lys and Soo 1995). We expect a negative relation between forecast errors and analyst following. We control for firm size (SIZE) as a proxy for a firm's general information environment (Atiase 1985; Hope 2003); we expect a negative relation between forecast errors and SIZE. Dichev and Tang (2009) suggest that volatile earnings are more difficult to forecast, so we include earnings volatility (ROAVOL). We expect the coefficient for ROAVOL to be positive. We control for accounting

losses (LOSS), because losses are difficult to predict (Hope 2003). We expect the coefficient for LOSS to be positive. Forecast horizon is likely to affect the amount of information available to analysts and hence forecast errors (O'Brien 1990). We control for FHORIZON, which is the median number of days between analyst forecasts and earnings announcements. Following Dhaliwal et al. (2012), we include FFIN to control for firms' financial opaqueness. FFIN is an indicator that is one if scaled accruals of a firm are higher than the firm's industry-year mean (Bhattacharya et al. 2003). We expect earnings forecasts for financially opaque firms to be less accurate than those for more transparent firms. Similar to Eq. (1), we include the inverse Mills ratio, MILLS, to control for self-selection bias. Finally, we include industry and year fixed effects. All variables in Eq. (2) are defined in Appendix 2.

Table 3, Panel A compares descriptive statistics for forecast errors across the CSR report quality groups. For the no-CSR, low, medium, and high CSR report quality groups, respectively, average FERROR(0) are 1.1%, 0.7%, 0.6% and 0.5%; average FERROR(1) are 3.4%, 2.5%, 2.7% and 1.8%; and average FERROR(2) are 5.7%, 3.8%, 4.2% and 3.3% of the share price. Forecast errors generally decrease with CSR report quality. Moving from the low to the high quality group, FERROR(0) decreases by 40%, FERROR(1) decreases by 20%, and FERROR(2) decreases by 13%, the trend consistent with our empirical prediction.

Table 3, Panel B reports results of estimating Eq. (2), after standard errors are adjusted for clustering by firm. Across columns, the coefficient estimates for LowQUALITY, MidQUALITY, and HighQUALITY are by large negative and statistically significant for MidQUALITY and HighQUALITY. Consistent with Panel A, forecast errors decrease with CSR report quality. Moving from the low to the high quality group reduces FERROR(1) and FERROR(2) by 1.5%, and 2.2% of share price. The reduction in FERROR(0) is not statistically

significant. The improvement in forecast accuracy is statistically significant and similar in magnitude going from low to medium quality and from medium to high quality. The signs on the control variables are consistent with Dhaliwal et al. (2012) except for ROAVOL. Contrary to the prediction and earlier findings, ROAVOL is negatively related to forecast errors. This likely occurs because KLD Strength and Concern capture firms' operational complexity.[15]

Overall, the results in Table 3 suggest that issuing low-quality CSR reports does not improve forecast accuracy compared to firms that do not issue CSR reports; however, issuing mid and high level quality reports improves forecast accuracy. For firms with CSR reports, being in the high-quality group is associated with better forecast accuracy than firms in both mid and low quality groups. The findings validate the measure of CSR report quality in terms of its informativeness for firm performance.

5. Additional Insights for the CSR Report Quality Measure

5.1. Style and Amount Dimensions of CSR Report Quality

In this section, we examine which dimension of the CSR Report quality drives the above findings. While a priori we expect both the STYLE and AMOUNT dimensions to be associated with CSR performance ratings and analyst forecast errors, this analysis is exploratory in nature.

Table 4, Panel A compares descriptive statistics for KLD ratings across the high and low STYLE and AMOUNT groups. STYLE refers to inverse optimism, pessimism, and readability of CSR reporting. The average KLD Strength (Concern) are 4.42 and 4.02 (3.42 and 3.54) for the low and high STYLE groups, respectively. In other words, KLD Strength decreases with STYLE. Moving from low to high STYLE decreases KLD Strength by 9% [=(4.02 – 4.42)/

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[15] In unreported analysis, when we estimate Eq. (2) without KLD Strength and Concerns, we find similar but slightly weaker results. The coefficient estimate for ROAVOL becomes statistically insignificant.

4.42]. In contrast, KLD Concern increases with STYLE. Moving from low to high STYLE increases KLD Concern by 37% [=(3.54 – 3.42)/3.42]. This finding is not surprising, because the pessimistic (optimistic) tone indicates concerns (strengths) associated with CSR activities.

AMOUNT refers to length, numerical content, and horizon content of CSR reporting. The average KLD Strength (Concern) are 3.81 and 5.49 (3.06 and 4.39) for the low and high AMOUNT groups, respectively. In other words, KLD Strength increases with AMOUNT. Moving from low to high AMOUNT increases KLD Strength by 44% [(5.49 – 3.81)/3.81]. Similarly, KLD Concern increases with AMOUNT. Moving from low to high AMOUNT increases KLD Concern by 43% [(4.38 – 3.06)/3.06]. Overall, the effect of CSR report quality on CSR performance is driven by the amount dimension rather than the style dimension.

Regarding analyst forecast errors, for the low and high STYLE groups, average FERROR(0) is 0.6% and 0.6%; average FERROR(1) is 2.7% and 2.1%; and average FERROR(2) is 4.1% and 3.7% of the share price. Forecast errors generally decrease with STYLE, and the high STYLE group has the lowest forecast errors. Moving from low to high STYLE group, FERROR(0) decreases by 11%, FERROR(1) decreases by 22% and FERROR(2) decreases by 35%.

For the low and high AMOUNT groups, average FERROR(0) is 0.6% and 0.6%; average FERROR(1) is 2.5% and 2.6%; and average FERROR(2) is 4.0% and 3.9% of the share price. Compared to STYLE, improvement in forecast accuracy is only marginal when we move from low to high AMOUNT group, and there is even an increase when FERROR(1) is considered. In sum, while the style dimension helps to improve analysts forecast accuracy, the amount dimension does not.

Table 4, Panel B reports results of estimating Eq. (1), which is modified to replace QUALITY with STYLE and AMOUNT. Columns (1) and (2) use LowSTYLE and HighSTYLE as indicators. When KLDSTRENGTH is the dependent variable, the coefficients for LowSTYLE and HighSTYLE are 3.77 and 3.70, respectively. When KLDCONCERN is the dependent variable, the coefficients for LowSTYLE and HighSTYLE are 1.87 and 1.98, respectively. Moving from the low to the high STYLE group, the Strength decreases by 2% and the Concern increases by 6%. These weak results are consistent with Panel A. Untabulated tests show that pessimism is the main driver of the results relative the other aspects of STYLE, i.e., optimism and readability. Columns (3) and (4) use LowAMOUNT and HighAMOUNT as indicators. When KLD STRENGTH is the dependent variable, the coefficients for LowAMOUNT and HighAMOUNT are 3.24 and 4.44, respectively. When KLDCONCERN is the dependent variable, the coefficients for LowAMOUNT and HighAMOUNT are 1.52 and 2.41, respectively. Moving from the low to the high AMOUNT group, the Strength increases by 37% and the Concern increases by 58%. Untabulated tests show that all aspects of AMOUNT, i.e., report length, numerical content, and horizon content, contribute to the findings.

Table 4, Panel C reports results of estimating Eq. (2), which is modified to replace the three QUALITY indicators with STYLE and AMOUNT. Columns (1) to (3) use LowSTYLE and HighSTYLE as independent variables. When FERROR(0), FERROR (1), and FERROR(2) are dependent variables, the coefficients for HighSTYLE are always lower than the coefficients for LowSTYLE. The differences are statistically significant when the dependent variables are FERROR(0) and FERRROR(1). These findings suggest that CSR report style is associated with improvements in analyst forecast accuracy. Untabulated tests show that all components of STYLE contribute to these results. Columns (4) to (6) use LowAMOUNT and HighAMOUNT

as independent variables. When FERROR(0), FERROR (1), and FERROR(2) are dependent variables, the coefficients for HighAMOUNT are not always lower than the coefficients for LowAMOUNT. The difference is significant only for Column (4), and its economic significance is minimal. Furthermore, untabulated tests show that none of the AMOUNT components, i.e., length, numerical, and horizon, contributes to the difference in forecast errors. These findings suggest that AMOUNT is not significantly associated with improvements in analyst forecast accuracy.

In sum, the AMOUNT dimension is more pronounced in the association between CSR report quality and CSR performance. However, STYLE dimension is more pronounced in the association between CSR report quality and analyst forecast errors.

5.2. First and Subsequent CSR Reports

Dhaliwal et al. (2011) show that firms with high cost of capital are more likely to initiate CSR reports and initiation of CSR reports is in turn associated with a reduction in the cost of capital for firms with superior CSR performance. As such, the positive association between CSR report quality and KLD ratings is likely attributable to initiation of CSR reports. To investigate, we split QUALITY indicators into their first and repeat indicators; specifically, FirstLowQUALITY and RepeatLowQUALITY; FirstMidQUALITY and RepeatMidQUALITY; and FirstHighQUALITY and RepeatHighQUALITY. There are 314 first CSR reports in the sample, out of which 11% are classified as low quality and 11% are classified as high quality.

Table 5, Panel A provides the results of estimating Eq. (1), where the QUALITY indicators are replaced by the first and repeat indicators. The results show that higher first and repeat CSR report quality are associated with higher Strength and Concern ratings. The first CSR report quality has less discriminant power for both strengths and concerns than the repeat CSR

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report quality, indicating a possible waiting period for firms to establish credibility of the information contained in the CSR report. Furthermore, significant coefficient estimates for repeat quality indicators mitigate the concern that some unobserved firm characteristics drive the overall relation between CSR report quality and CSR performance ratings.

Table 5, Panel B provides the results of estimating Eq. (2), where the QUALITY indicators are replaced by the first and repeat indicators. We find that, compared to first CSR reports, the repeated CSR reports and those of mid and high qualities are more strongly associated with lower analyst forecast errors.

Overall, we show that while the first CSR reports are informative about CSR performance, they are weakly associated with lower forecast errors. The repeated CSR reports of mid or high quality are associated with both CSR performance ratings and lower analysts' forecast errors. It appears that firms establish their credibility of the information contained in the CSR report over time.

5.3. Alternative Measures for CSR Report Quality

KLD rates a firm's CSR reporting quality using a Strength or Concern indicator. This rating is not focused on the CSR report narratives but on the overall disclosures regarding CSR activities. In addition, the Global Reporting Initiative (GRI) provides principles and broad guidance on CSR report disclosures. If our measure of CSR report quality is valid, then we predict that our measure is significantly associated with KLD reporting quality ratings as well as indicators of firms that follow the GRI format in CSR reports.

Albeit these predictions, developing an objective and transparent measure of CSR report quality is a worthwhile endeavor for the following reasons. First, the KLD reporting quality ratings are a black-box in terms of the criteria utilized. Second, the GRI guidelines mostly focus

on the form but not the substance of the disclosures. In contrast, our measure is transparent and, as such, can be further refined and improved by future research on different narratives. Furthermore, our measure, which is based on the six aspects of narratives, depends on the substance of the disclosures.

Table 6, Panel A presents how our quality measure, QUALITY, correlates with indicators for companies following the GRI format as well as indicators for companies with KLD-assigned Strength and Concern reporting quality ratings. We find that percentage of CSR reports that comply with the GRI format are 4.4%, 31.5%, and 53.4% for the low, mid and high QUALITY groups, respectively. That is, CSR reports that follow the GRI format are also likely to be increasingly classified as higher quality by our substance-based measure. Similarly, the percentage of CSR reports that have KLD-assigned Strength reporting quality ratings are 10.3%, 20.1%, and 41.1% for the low, mid, and high QUALITY groups, respectively. That is, our objective procedure of rating CSR narrative quality results in ratings that correlate with the KLD reporting quality ratings. None of the companies that are in the low, mid, and high QUALITY groups have KLD-assigned Concern reporting quality ratings. Collectively, these univariate statistics provide some degree of additional validity to our quality measure, QUALITY.

Table 6, Panels B and C report results of Eqs. (1) and (2) after adding indicators for companies following the GRI format as well as indicators for companies with KLD-assigned Strength and Concern reporting quality ratings. We find that our CSR report quality score is incrementally associated with CSR performance ratings, and especially for Concern ratings (Table 6, Panel B). The coefficient estimates for LowQUALITY, MidQUALITY, and HighQUALITY are substantially lower than those in Table 2, Panel B, possibly because the KLD's reporting quality ratings are mechanically related to CSR performance. Furthermore,

QUALITY is incrementally associated with analysts' forecast errors (Table 6, Panel C). However, the statistical significance of coefficient estimates is substantially lower, due to the effect of the added indicators. In particular, most of our quality measures are significant at the ten-percent level for a one-tailed test. Interestingly, firms following the GRI format have lower forecast errors as one would predict if GRI format represents CSR report quality. However, KLD transparency concern is associated with lower forecast errors, indicating that the KLD transparency score may not be a good candidate to measure CSR report quality. Collectively, the regression results in Panels B and C corroborate the validity of our quality measure, QUALITY.

6. Conclusion

CSR reporting is largely unregulated and therefore is not subject to the well-developed accountability framework similar to that of financial reporting. However, the recent evidence shows that the disclosure of CSR activities is associated with capital market benefits such as lower cost of capital and analyst forecast accuracy. Based on the insights from prior literature, we develop a CSR report quality measure, QUALITY, by using narratives in the CSR reports. To do this, we aggregate (inverse) optimism, pessimism, readability, length, numerical content, and horizon content aspects of narratives in CSR reports. We assess CSR reports to be of higher quality if they 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.

We validate QUALITY by examining its association with (a) CSR performance as measured by KLD Strength and Concern ratings, (b) analyst forecast accuracy, (c) alternative measures of CSR reporting transparency. We find that both KLD Strength and Concern ratings increase with QUALITY, indicating that high-quality reports help users receive more

information on both the strengths and weaknesses of CSR activities of a company. Furthermore, analyst forecast accuracy increases with QUALITY. Finally, we show that firms that follow the GRI format and firms that have positive KLD-assigned CSR reporting quality indicators have higher QUALITY scores. Collectively, the evidence shows that our quality measure captures the informativeness CSR reports.

Our paper uses objective criteria for analyzing company narratives and takes a first step in developing a quality measure for standalone CSR reports issued by firms. Future research can help to refine this measure by either considering more aspects of narratives and/or refining the linguistic measures appropriately. Therefore, we believe our measure for the narrative quality has significant potential to be employed for narratives in other contexts.

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Appendix 1. Textual Analysis and Variable Definitions

Procedure
1. We manually match the CSR reports with firm identifiers in *Compustat* and *CRSP* databases, CUSIP, PERMNO, TICKER, and GVKEY. We obtain 1,412 firm-years with CSR reports.
2. We reformat CSR reports from pdf to txt format and use a Java code to analyze the narratives in CSR reports.
3. Some firms publish CSR reports every two or three years. We assume that these firms have the same CSR narratives in non-report years as in the year of their most recent CSR reports. If a firm has issued a CSR report during our sample period, we fill the subsequent non-report years with the most recent report. For example, if a firm issued CSR reports in 2006 and 2008 (but not in 2007 and 2009), we fill CSR data in 2007 with that in 2006, and CSR data in 2009 with that in 2008. This forward-filling procedure increases our sample from 1,412 to 1,541 firm-year observations.

Defining Aspects of CSR Report Quality
CSR Report Quality is composed of the following six independent aspects:

1. (Inverse) Optimism: CSR report quality is inversely related with optimism in the report's narrative. We measure optimism of a CSR report using the number of positive financial words in Loughran and McDonald (2011). We obtain the list of positive words from Professor Bill McDonald's website at http://www3.nd.edu/~mcdonald/Word_Lists.html.
RATIO_OPT: Number of financial positive words divided by the number of words in the CSR report (Loughran and McDonald 2011).

2. Pessimism: We measure pessimism of a CSR report using the number of negative financial words in Loughran and McDonald (2011). We obtain the list of negative words from Professor Bill McDonald's website at http://www3.nd.edu/~mcdonald/Word_Lists.html.
RATIO_PESS: Number of financial negative words divided by the number of words in the CSR report (Loughran and McDonald 2011).

3. Readability: We measure readability of a CSR report using the Smog index (Simple Measure of Gobbledygook) developed by Harry McLaughlin. The Smog index is based on the number of years of formal education a reader of average intelligence would need to read and understand the text.
SMOG: Smog index of the CSR report, 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: We measure the length of a CSR report using the logarithm of the total number of words orthogonalized relative to its obfuscation component (i.e., high Smog index).
WORDS: Logarithm of the number of words in the CSR report.
RESWORDS: The residual from the regression WORDS= $\alpha + \beta*\text{SMOG} + \varepsilon$, which is estimated for each year and Fama-French (1997) industry.

5. Numerical content: We measure the numerical content of a CSR report using a count of numbers and quantitative words as in Muslu et al. (2013).
RATIO_NUMERICAL: Number of Arabic numerals plus quantitative words divided by the

number of words in the CSR report. 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: We measure the horizon content of a CSR report using the count of references to future years and horizon words as in Muslu et al. (2013).
RATIO_HORIZON: Number of future years (e.g., 2012 (2007) is (is not) a future year for a CSR report issued in 2008) plus horizon words divided by number of words in the CSR report. 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 Narratives
The table below provides the descriptive statistics of the six aspects for 1,541 CSR Reports.

1,000 except SMOG	Mean	Std. Dev.	Min	Q1	Q2	Q3	Max
RATIO_OPT	15.75	5.21	0.00	12.78	15.47	18.77	35.97
RATIO_PESS	8.08	4.03	0.00	5.37	7.59	10.32	32.59
SMOG	19.02	5.32	4.48	17.58	18.56	19.47	147.20
RESWORDS	0.00	0.77	-6.19	-0.42	0.00	0.48	2.83
RATIO_NUMERICAL	37.25	24.46	0.00	23.03	32.21	45.69	267.40
RATIO_HORIZON	1.55	1.25	0.00	0.78	1.26	2.05	12.58

The mean percentage of optimistic words, RATIO_OPT, is higher than the percentage of pessimistic words, RATIO_PESS, consistent with greater managerial optimism in disclosures that lack the accountability framework. The mean SMOG implies that an average reader needs to have a graduate level degree to understand a CSR report. Average RESWORDS, which is the residual of the report length orthogonalized relative to report complexity, is by definition zero. Average RATIO_NUMERICAL and average RATIO_HORIZON suggest that firms reasonably use numerical and horizon content in the CSR reports.

The table below reports Pearson (Spearman) correlations of the six aspects below (above) the diagonal with *, **, *** indicating statistical significance of the correlation coefficients at the 10%, 5%, and 1% levels, respectively.

	RATIO_OPT	RATIO_PESS	SMOG	RES WORDS	RATIO_NUMER.	RATIO_HORIZON
RATIO_OPT		0.091***	-0.021	-0.064**	-0.152***	0.100***
		(0.00)	(0.41)	(0.02)	(0.00)	(0.00)
RATIO_PESS	0.040		0.003	0.075***	0.126***	0.189***
	(0.12)		(0.90)	(0.00)	(0.00)	(0.00)
SMOG	0.085***	0.091***		0.000	0.048*	-0.033
	(0.00)	(0.00)		(1.00)	(0.06)	(0.20)
RESWORDS	-0.077***	0.159***	0.014		-0.013	-0.057**
	(0.00)	(0.00)	(0.58)		(0.60)	(0.03)
RATIO_NUMER.	-0.106***	0.235***	0.095***	0.104***		0.175***
	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)
RATIO_HORIZON	0.132***	0.206***	0.116***	0.013	0.306***	
	(0.00)	(0.00)	(0.00)	(0.61)	(0.00)	

RATIO_OPT and RATIO_PESS are positively correlated. However, RATIO_OPT is negatively correlated with both RESWORDS and RATIO_NUMERICAL whereas RATIO_PESS is positively correlated with these aspects. This indicates that, in contrast to pessimistic tone, optimistic tone is less supported by other indicators of report quality, likely due to the lack of the accountability framework. RESWORDS and SMOG have zero correlation by design. RATIO_NUMERICAL and RATIO_HORIZON are significantly positively correlated, suggesting that companies strategize in making more credible disclosures. In general, we observe positive, albeit slight and at times insignificant, correlations across the components, indicating that these components likely capture a common construct of quality.

Computing CSR Report Quality
Based on findings of prior literature, we label a CSR report as high-quality 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. We merge these six (ranked) components into a single measure using the following formula:

QUALITY: The sum of decile ranks (scaled between 0.1 and 1) of RATIO_PESS, RESWORDS, RATIO_NUMERICAL, RATIO_HORIZON and inverse decile ranks (scaled between 0.1 and 1) of RATIO_OPT and SMOG.

QUALITY ranges between 0.6 and 6. We define the following indicator variables using QUALITY:
LowQUALITY: Indicator variable that is one if QUALITY is less than or equal to two.
MidQUALITY: Indicator variable that is one if QUALITY is greater than two and less than or equal to four.
HighQUALITY: Indicator variable that is one if QUALITY is greater than four.

We partition QUALITY into its style and amount dimensions. The first three components of QUALITY (i.e., optimism, pessimism, and readability) relates to the style of the report. We define STYLE as follows:

STYLE: The sum of the decile rank (scaled between 0.1 and 1) of RATIO_PESS, and the inverse decile ranks (scaled between 0.1 and 1) of RATIO_OPT and SMOG.
LowSTYLE: Indicator variable that is one if STYLE is less than two.
HighSTYLE: Indicator variable that is one if STYLE is greater than or equal to two.

The last three components of QUALITY (i.e., length, numerical content, and horizon content) relates to the amount of information included in the report. We define AMOUNT as follows:

AMOUNT: The sum of the decile ranks (scaled between 0.1 and 1) of RESWORDS, RATIO_NUMERICAL, and RATIO_HORIZON.
LowAMOUNT: Indicator variable that is one if AMOUNT is less than two.
HighAMOUNT: Indicator variable that is one if AMOUNT is greater than or equal to two.

Defining Textual Control Variables
In order to study the CSR report narratives incremental to other company narratives, we control for narrative features of company 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_PESS: Number of financial negative words divided by the number of words in the 10-K report (Loughran and McDonald 2011).
10KPESS: 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 10-KLOGWORDS = α +β*10-KSMOG + ε, which is estimated for each year and Fama-French (1997) industry.
10KLONG: Decile rank of 10KRESWORDS, between 0.1 and 1.

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.
Low(Mid) [High] QUALITY:	An indicator variable that is one if the firm-year sum of decile ranks of the six aspects of CSR Report narratives is less than 2 (between 2 and 4) [greater than four]. See Appendix 1 for definition of the six aspects: inverse optimism, pessimism, readability, length, numerical content, and horizon content.
Low(High)STYLE:	An indicator variable that is one if the firm-year sum of decile ranks of three style-related aspects of CSR Report narratives is less than 2 (greater than 2). See Appendix 1 for definition of the three aspects: inverse optimism, pessimism, and readability.
Low(High)AMOUNT:	An indicator variable that is one if the firm-year sum of decile ranks of three amount-related aspects of CSR Report narratives is less than 2 (greater than 2). See Appendix 1 for the definition of the three aspects: length, numerical content, and horizon content.
RepeatLow(Mid) [High] QUALITY:	An indicator variable that is one if the firm-year is in the Low(Mid)[High] CSR reporting quality group for the second year in a row.
FIRSTCSR:	An indicator variable that is one if the firm-year observation is the first time the firm issues a CSR report.
FIRSTLow(Mid) [High] QUALITY:	An indicator variable that is one if the first firm-year observation with a CSR report is in the Low(Mid)[High] CSR reporting quality 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):	Absolute value of the mean forecast error, scaled by beginning of the fiscal year price. X=0,1,2 stand for contemporaneous, one-year ahead and two-years ahead forecasts, respectively

Other control variables (in alphabetical order)

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.
BUSSEG:	Natural logarithm of the number of business segments from the Compustat segment files at the end of the fiscal year.
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, and zero otherwise. The coverage period of this data is 2002-2008. For years 2009 and 2010, we assume the same firms in 2008 are included in the index.
FFIN:	Measure of financial transparency using industry-year-adjusted total 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 (ACCRUAL) are computed as follows: $\Delta CA - \Delta CL - \Delta CASH + \Delta STD - DEP + \Delta TP$, where ΔCA (ΔCL) is the change in total current assets (liabilities); $\Delta CASH$ is the change in cash; ΔSTD is the change in the current portion of long-term debt; DEP is depreciation and amortization expense; and ΔTP is the change in income taxes payable. FFIN takes the value of 1 if a firm has a higher than industry-year mean of ACCRUAL, and 0 otherwise (Bhattacharya et al. 2003).
FHORIZON:	Forecast horizon, calculated as the median number of days between analyst forecasts and earnings announcement.
GEOSEG:	Natural logarithm of the number of geographical segments from the Compustat segment files at the end of a fiscal year.

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 do not have the Newsweek green rating.
HERFINDEX:	Herfindahl-Hirschman index of industry competition, calculated as the natural logarithm of the sum of squared ratios of firm sales over industry sales.
LEV:	Long term debt scaled by total assets.
LOSS:	Indicator variable that equals to one if the firm reports negative earnings at year end, zero otherwise.
M/B:	Market-to-book value of equity, computed as (common shares outstanding * fiscal year-end price)/(book value of equity).
MANFORECAST:	Number of management earnings forecasts issued during the firm-year.
MILLS:	The inverse Mills ratio from the first stage probit model as described in Appendix 4. It is used to control for the selection bias, i.e., the decision to publish a stand-alone CSR report.
MKTSHARE:	The firm's fraction of sales in its two-digit SIC industry.
R&D:	Research and development expenditures scaled by total sales, and adjusted by industry-year median.
RETVOL:	Stock return volatility, calculated by the standard deviation of monthly returns during the previous two years. Data Source: CRSP.
ROA:	Net income scaled by total assets.
ROAVOL:	Earnings volatility, computed as the standard deviation of previous five years' return on assets. 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 Quality Variables	
KLDQUAL_ STRENGTH:	An indicator variable that is one if KLD evaluates the quality of a firm's reporting on its corporate 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, its setting of specific goals for its CSR efforts, and quantitative measurement of progress towards 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.
KLDQUAL_ CONCERN:	An indicator variable that is one if KLD evaluates the quality of a firm's reporting on its corporate 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, its setting of specific goals for its CSR efforts, and quantitative measurement of progress towards these goals. . The strength indicator shows that the company is distinctly weak in reporting on a wide range of social and environmental performance measures.
GRI FORMAT:	An indicator variable that is one if the CSR Report follows the GRI reporting format.

Appendix 3. Self Selection

CSR report quality can only be observed for 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 relationships between CSR report quality and CSR performance. We address this selection issue by using the Heckman (1979) two-stage 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:

$$
\begin{array}{llll}
\text{CSRREPORT} = & \beta_0 & + \beta_1 \text{DJINDEX} & + \beta_2 \text{GREEN} & + \beta_3 \text{MANFORECAST} \\
& (-5.537)^{***} & (1.004)^{***} & (0.005)^{***} & (0.072)^{***} \\
& + \beta_4 \text{ANALYST} & + \beta_5 \text{SIZE} & + \beta_6 \text{ROA} & + \beta_7 \text{LEV} \\
& (-0.002) & (0.424)^{***} & (-1.421)^{***} & (0.474)^{***} \\
& + \beta_8 \text{R\&D} & + \beta_9 \text{MKTSHARE} & + \beta_{10} \text{AGE} & + \beta_{11} \text{CAPX} \\
& (-1.517)^{***} & (1.698)^{***} & (0.178)^{***} & (0.259) \\
& + \beta_{12} \text{ROAVOL} & + \beta_{13} \text{FFIN} & & \\
& (-0.114)^{***} & (-5.537) & &
\end{array}
$$

The variables are defined in Appendix 2. The coefficient estimates are reported in parentheses below the variables and *, **, *** indicate statistically significant coefficient estimates at 10%, 5%, and 1% levels based on robust standard errors. MANFORECAST is the instrument variable and represents unobservable factors that are likely to be correlated with the firms' decision to provide voluntary disclosures. The pseudo-R^2 of the model is 37.9%. 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. The instrument variable MANFORECAST is positively associated with the likelihood of issuing CSR report and unreported tests indicate that the instrument is strong. We calculate the inverse Mills ratio (MILLS) from the first stage probit model and use MILLS as an additional control variable in the subsequent models to control for the factors that lead to firm's decision to provide CSR reports.

Table 1: Sample and CSR Report Quality

Panel A: Sample Composition

	KLD Firms	KLD Firms with CSR Reports	% of KLD Firms with CSR Reports
Years			
2000	379	44	12%
2001	703	76	11%
2002	754	97	13%
2003	2,073	114	5%
2004	2,118	132	6%
2005	2,156	153	7%
2006	2,170	168	8%
2007	2,259	208	9%
2008	2,307	255	11%
2009	2,188	294	13%
Total	17,107	1,541	9%

Industry			
Consumer Non-Durables	832	120	14%
Consumer Durables	379	17	4%
Manufacturing	1,688	240	14%
Energy	721	94	13%
Chemicals and Allied Products	464	115	25%
Business Equipment	2,878	226	8%
Communication	510	46	9%
Utilities	564	164	29%
Wholesale, Retail, and Services	1,624	118	7%
Healthcare and Drugs	1,699	75	4%
Finance	3,820	175	5%
Other	1,928	151	8%
Total	17,107	1,541	9%

Panel B: Examples of Different CSR Report Quality Scores

| | Year | Company | STYLE | | | AMOUNT | | | | | |
			Decile Rank of RATIO_PESS	Inverse Decile Rank of SMOG	Inverse Decile Rank of RATIO_OPT	Decile Rank of RESWORDS	Decile Rank of RATIO_NUMERICAL	Decile Rank of RATIO_HORIZON	STYLE	AMOUNT	QUALITY
HighQUALITY	2008	UNITED TECHNOLOGIES CORP	1	0.7	0.9	1	1	1	2.6	3	5.6
	2009	CADENCE DESIGN SYSTEMS INC	0.6	0.8	1	1	1	1	2.4	3	5.4
	2004	OFFICEMAX INC	0.7	1	1	0.5	1	1	2.7	2.5	5.2
	2004	PARKER-HANNIFIN CORP	1	0.9	1	0.4	1	0.9	2.9	2.3	5.2
	2007	UNITED PARCEL SERVICE INC	0.6	0.9	0.7	0.9	1	1	2.2	2.9	5.1
MidQUALITY	2009	VERIZON COMMUNICATIONS INC	0.8	0.7	0.5	0.8	0.8	0.4	2	2	4
	2003	BRISTOL-MYERS SQUIBB CO	0.6	0.5	0.7	0.8	0.6	0.8	1.8	2.2	4
	2008	BROWN-FORMAN	0.9	0.9	0.7	0.6	0.3	0.6	2.5	1.5	4
	2005	CUMMINS INC	0.3	0.8	0.4	0.9	0.7	0.9	1.5	2.5	4
	2001	DEERE & CO	0.8	0.8	0.6	0.5	0.5	0.8	2.2	1.8	4
LowQUALITY	2002	COMCAST CORP	0.2	0.5	0.1	0.8	0.2	0.2	0.8	1.2	2
	2005	CONAGRA FOODS INC	0.2	0.8	0.1	0.3	0.1	0.5	1.1	0.9	2
	2002	EMERSON ELECTRIC CO	0.5	0.1	0.4	0.6	0.1	0.3	1	1	2
	2006	CENTERPOINT ENERGY INC	0.1	0.3	0.2	0.4	0.7	0.3	0.6	1.4	2
	2007	INTEL CORP	0.1	0.8	0.2	0.4	0.2	0.3	1.1	0.9	2

Panel C: CSR Report Quality classifications by year

Years	Firms with CSR Reports	% of Firms with CSR Reports classified as						
		LowQUALITY	MidQUALITY	HighQUALITY	LowSTYLE	HighSTYLE	LowAMOUNT	HighAMOUNT
2000	44	7%	86%	7%	73%	27%	75%	25%
2001	76	7%	79%	14%	71%	29%	68%	30%
2002	97	10%	71%	19%	72%	28%	70%	29%
2003	114	9%	76%	15%	75%	25%	68%	32%
2004	132	11%	70%	19%	71%	29%	69%	31%
2005	153	8%	78%	14%	76%	24%	67%	33%
2006	168	11%	73%	16%	76%	24%	71%	29%
2007	208	9%	76%	15%	67%	33%	72%	28%
2008	255	9%	76%	15%	73%	27%	72%	28%
2009	294	7%	78%	15%	74%	26%	69%	31%

The sample includes all U.S. companies with Corporate Social Responsibility (CSR) activity ratings issued by the KLD database. The sample period is between 2000 and 2009. The top portion of Panel A reports the sample breakdown across years; and the bottom portion reports the sample breakdown across 12 Fama-French industry groups. Panel B provides examples of companies with CSR reports classified as High, Mid, and Low Quality. Panel C reports sample breakdown across CSR reporting quality, style, and amount. Appendix 1 describes the procedure of computing QUALITY and its components STYLE and AMOUNT.

Table 2: CSR Report Quality and CSR Performance Ratings

Panel A: Descriptive Statistics

Mean (Median)	No CSR Report	CSR Report Quality (QUALITY)		
		Low	Mid	High
CSR performance ratings				
KLDSTRENGTH	0.827 (0)	3.713*** (3***)	4.203*** (4***)	5.203*** (4***)
KLDCONCERN	1.187 (1)	2.36*** (2***)	3.345*** (3***)	4.606*** (4***)
10-K narratives				
10KRATIO_OPT*1,000	5.691 (5.686)	5.591 (5.656)	5.935*** (6.011***)	5.836 (5.925**)
10KRATIO_PESS*1,000	10.610 (10.393)	10.596 (10.260)	10.425 (10.162)	10.210 (9.874**)
10KSMOG	24.384 (21.127)	25.328 (21.156)	24.716 (21.085)	24.861 (21.322)
10KRESWORDS	-0.017 (0.023)	0.157*** (0.201***)	0.166*** (0.174***)	0.208*** (0.212***)
Firm characteristics				
ANALYST	9.505 (8)	20.000*** (20***)	17.230*** (17***)	17.674*** (17***)
SIZE	6.916 (6.801)	9.202*** (9.259***)	9.070*** (9.237***)	9.272*** (9.32***)
ROA	0.027 (0.037)	0.049*** (0.041)	0.057*** (0.050***)	0.057*** (0.049***)
LEV	0.191 (0.126)	0.201 (0.145)	0.218*** (0.202***)	0.224*** (0.212***)
R&D	0.076 (0)	0.007*** (0**)	-0.03*** (0***)	-0.025*** (0***)
RETVOL	0.158 (0.107)	0.099*** (0.087***)	0.096*** (0.083***)	0.09*** (0.077***)
M/B	3.105 (2.165)	2.694*** (1.819)	3.235 (2.344***)	3.067 (2.297)
BUSSEG	2.383 (1.946)	2.887*** (2.639***)	3.093*** (2.708***)	3.506*** (2.944***)
GEOSEG	2.731 (2.303)	2.537* (2.197)	2.625*** (2.303**)	3.009 (2.303***)
HERFINDEX	0.061 (0.04)	0.044*** (0.036***)	0.063 (0.039**)	0.074*** (0.043)

Panel B: Regression Results

	KLDSTRENGTH		KLDCONCERN	
LowQUALITY	3.279***	3.272***	1.074***	1.076***
	(6.01)	(6.13)	(3.67)	(3.78)
MidQUALITY	3.642***	3.616***	1.779***	1.764***
	(9.52)	(9.55)	(6.78)	(6.92)
HighQUALITY	4.429***	4.403***	2.645***	2.628***
	(9.04)	(9.08)	(7.37)	(7.44)
(1-10KOPT)		-0.294***		0.191**
		(-3.21)		(2.54)
10KPESS		0.019		0.735***
		(0.21)		(9.96)
10KREADABLE		0.023		-0.101*
		(0.37)		(-1.86)
10KLONG		0.307***		0.248***
		(4.20)		(3.68)
ANALYST	0.021***	0.020***	-0.002	-0.007*
	(4.38)	(4.12)	(-0.63)	(-1.66)
SIZE	0.427***	0.414***	0.328***	0.335***
	(12.89)	(12.48)	(12.45)	(12.89)
ROA	-0.613***	-0.508***	-0.888***	-0.552***
	(-4.67)	(-3.99)	(-7.90)	(-5.21)
LEV	-0.261**	-0.310***	0.067	-0.012
	(-2.31)	(-2.73)	(0.66)	(-0.12)
R&D	-0.084***	-0.089***	-0.064**	-0.034
	(-2.80)	(-2.94)	(-2.16)	(-1.20)
RETVOL	-0.053***	-0.070***	-0.142***	-0.176***
	(-3.53)	(-4.59)	(-7.23)	(-8.73)
M/B	-0.006	-0.006	-0.033***	-0.029***
	(-0.88)	(-0.81)	(-5.48)	(-5.06)
BUSSEG	0.036	0.034	0.095***	0.096***
	(1.36)	(1.28)	(2.89)	(2.94)
GEOSEG	-0.012	-0.015	0.036**	0.036**
	(-0.74)	(-0.95)	(2.13)	(2.12)
HERFINDEX	0.387	0.445	1.387**	1.505**
	(0.61)	(0.71)	(2.20)	(2.42)
MILLS	-1.126***	-1.125***	-0.495***	-0.494***
	(-4.94)	(-4.97)	(-3.52)	(-3.63)
Year and industry fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	43.2%	43.5%	35.1%	36.6%
N	17,707	17,707	17,707	17,707
MidQUALITY-LowQUALITY	0.363***	0.344***	0.705***	0.688***
(F-statistic)	(45.77)	(45.99)	(24.66)	(25.48)
HighQUALITY-MidQUALITY	0.787***	0.787***	0.866***	0.864***
(F-statistic)	(49.39)	(49.82)	(31.03)	(31.93)

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 QUALITY 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.

Table 3: CSR Report Quality and Analyst Forecast Accuracy

Panel A: Descriptive Statistics

Mean	No	CSR Report Quality		
(Median)	CSR Report	Low	Mid	High
FERROR(0)	1.136	0.693	0.612***	0.540***
	(0.218)	(0.146***)	(0.148***)	(0.133***)
FERROR(1)	3.437	2.518*	2.655***	1.819***
	(0.989)	(0.724**)	(0.679***)	(0.817***)
FERROR(2)	5.694	3.815**	4.174***	3.321***
	(1.627)	(1.284**)	(1.106***)	(1.154***)
N	15,566	136	1,169	236

Panel B: Regression Results

	FERROR(0)	FERROR(1)	FERROR(2)
LowQUALITY	-0.078	-0.717	0.416
	(-0.22)	(-0.69)	(0.39)
MidQUALITY	-0.473**	-1.451**	-0.837
	(-2.37)	(-1.98)	(-1.19)
HighQUALITY	-0.540**	-2.182***	-1.835**
	(-2.01)	(-2.61)	(-2.07)
KLDSTRENGTH	0.178***	0.384***	0.528***
	(4.35)	(3.99)	(3.87)
KLDCONCERN	0.089***	0.225***	0.328***
	(2.83)	(3.36)	(3.34)
ANALYST	-0.002	0.018	0.016
	(-0.23)	(0.99)	(0.58)
SIZE	-0.462***	-1.275***	-1.845***
	(-8.05)	(-9.45)	(-9.72)
ROAVOL	-0.167***	-0.287**	-0.139
	(-3.56)	(-2.19)	(-0.55)
LOSS	2.244***	6.679***	11.123***
	(15.14)	(17.68)	(18.08)
FHORIZON	0.008***	0.007**	0.015***
	(6.10)	(2.39)	(2.64)
FFIN	-0.060	-1.044*	-1.035
	(-0.20)	(-1.89)	(-0.90)
MILLS	0.197*	1.137*	0.591
	(1.88)	(1.72)	(1.28)
Year and industry fixed effects	Yes	Yes	Yes
Adjusted R^2	13.3%	17.0%	20.2%
N	15,874	15,405	12,034
MidQUALITY - LowQUALITY	-0.395**	-0.734**	-1.253
(F-statistic)	(3.72)	(3.11)	(1.40)
HighQUALITY - MidQUALITY	-0.067*	-0.731**	-0.998*
(F-statistic)	(2.88)	(3.83)	(2.37)

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 QUALITY 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.

Table 4: Components of CSR Report Quality

Panel A: Descriptive Statistics

Mean (Median)	No CSR Report	CSR Report STYLE		CSR Report AMOUNT	
		Low	High	Low	High
KLDSTRENGTH	0.827 (0)	4.423*** (4***)	4.019*** (3***)	3.812*** (3***)	5.486*** (5***)
KLDCONCERN	1.187 (1)	3.416*** (3***)	3.544*** (3***)	3.055*** (3***)	4.384*** (4***)
FERROR(0)	1.136 (0.218)	0.630*** (0.140***)	0.551*** (0.167***)	0.618*** (0.141***)	0.585*** (0.152***)
FERROR(1)	3.437 (0.989)	2.654*** (0.707***)	2.144*** (0.704***)	2.457*** (0.665***)	2.646*** (0.776***)
FERROR(2)	5.694 (1.627)	4.129*** (1.112***)	3.694*** (1.226***)	4.046*** (1.094***)	3.928*** (1.194***)
N	15,566	1,120	421	1,120	421

Panel B: Regression Results of CSR Performance Ratings on Components of QUALITY

	X = STYLE		X = AMOUNT	
	KLDSTRENGTH	KLDCONCERN	KLDSTRENGTH	KLDCONCERN
Low X	3.769***	1.869***	3.235***	1.519***
	(9.54)	(7.08)	(9.17)	(6.28)
High X	3.696***	1.979***	4.435***	2.405***
	(9.02)	(7.25)	(9.78)	(8.09)
Firm characteristics	Yes	Yes	Yes	Yes
Year and ind. F.E.	Yes	Yes	Yes	Yes
Adjusted R^2	43.3%	36.1%	43.9%	36.6%
N	17,107	17,107	17,107	17,107
High X - Low X	-0.073***	0.110***	1.200***	0.887***
(F-statistic)	(47.55)	(28.28)	(50.43)	(32.75)

Panel C: Regression Results of Analyst Forecast Errors on Components of QUALITY

	X=STYLE			X=AMOUNT		
	FERROR(0)	FERROR(1)	FERROR(2)	FERROR(0)	FERROR(1)	FERROR(2)
Low X	-0.417**	-1.292*	-0.684	-0.460**	-1.703*	-0.885
	(-2.02)	(-1.85)	(-0.99)	(-2.30)	(-1.87)	(-1.25)
High X	-0.586**	-2.314**	-1.699*	-0.460**	-1.204**	-0.959
	(-2.57)	(-2.32)	(-1.82)	(-1.96)	(-1.97)	(-1.16)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year and ind. F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	13.3%	17.1%	20.2%	13.3%	17.0%	20.2%
N	15,874	15,405	12,034	15,874	15,405	12,034
High X - Low X	-0.169**	-1.022*	-1.015	-0.0002*	0.499	-0.104
(F-statistic)	(3.30)	(2.83)	(1.79)	(2.66)	(2.24)	(0.85)

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 STYLE and AMOUNT 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.

Table 5 First and Repeat CSR Report Quality

Panel A: Regression Results of CSR Performance on First and Repeat CSR Report Quality

	KLDSTRENGTH		KLDCONCERN	
RepeatLowQUALITY	1.377**	1.382**	0.210	0.213
	(2.18)	(2.19)	(0.71)	(0.72)
RepeatMidQUALITY	2.287***	2.290***	1.196***	1.198***
	(7.98)	(7.98)	(5.75)	(5.75)
RepeatHighQUALITY	3.187***	3.188***	2.102***	2.102***
	(6.47)	(6.48)	(4.44)	(4.45)
FIRSTCSR		0.978***		0.620***
		(4.07)		(3.42)
FIRSTLowQUALITY	0.459		0.271	
	(1.29)		(0.94)	
FIRSTMidQUALITY	1.009***		0.566***	
	(4.07)		(3.03)	
FIRSTHighQUALITY	1.250***		1.342***	
	(3.47)		(3.49)	
Firm characteristics	Yes	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes	Yes
Adjusted R^2	38.4%	38.4%	34.8%	34.8%
N	17,107	17,107	17,107	17,107
RepeatMidQUALITY-RepeatLowQUALITY	0.91***	0.908***	0.986***	0.985***
(F-statistic)	(31.84)	(31.88)	(17.68)	(17.66)
RepeatHighQUALITY-RepeatMidQUALITY	0.90***	0.898***	0.906***	0.904***
(F-statistic)	(44.12)	(44.13)	(21.47)	(21.45)
FIRSTMidQUALITY-FIRSTLowQUALITY	0.55***		0.295***	
(F-statistic)	(8.87)		(4.68)	
FIRSTHighQUALITY-FIRSTMidQUALITY	0.241***		0.776***	
(F-statistic)	(9.74)		(8.1)	

Panel B: Regression Results of Analyst Forecast Errors on First and Repeat CSR Report Quality

	FERROR(0)		FERROR(1)		FERROR(2)	
RepeatLowQUALITY	-0.162	-0.164	0.209	0.212	1.571	1.564
	(-0.77)	(-0.78)	(0.19)	(0.19)	(0.98)	(0.98)
RepeatMidQUALITY	-0.393**	-0.394**	-1.040*	-1.035*	-0.201	-0.202
	(-2.35)	(-2.36)	(-1.67)	(-1.66)	(-0.35)	(-0.35)
RepeatHighQUALITY	-0.548**	-0.548**	-1.919***	-1.910***	-1.900**	-1.896**
	(-2.38)	(-2.39)	(-2.94)	(-2.94)	(-2.49)	(-2.49)
FIRSTCSR		-0.193		-0.615		-0.588
		(-1.33)		(-1.60)		(-1.02)
FIRSTLowQUALITY	-0.001		-0.574		0.241	
	(-0.00)		(-0.62)		(0.21)	
FIRSTMidQUALITY	-0.225		-0.385		-0.597	
	(-1.48)		(-0.93)		(-0.96)	
FIRSTHighQUALITY	-0.153		-2.309**		-1.389	
	(-0.42)		(-2.43)		(-1.00)	
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	13.2%	13.2%	17.0%	17.0%	20.1%	20.1%
N	15,874	15,874	15,405	15,405	12,034	12,034
RepeatMidQUALITY-RepeatLowQUALITY	-0.231*	-0.230*	-1.249	-1.247	-1.772	-1.766
(F-statistic)	(2.97)	(2.98)	(2.12)	(2.11)	(0.60)	(0.60)
RepeatHighQUALITY-RepeatMidQUALITY	-0.155**	-0.154**	-0.879**	-0.875**	-1.699**	-1.694**
(F-statistic)	(3.69)	(3.71)	(4.57)	(4.55)	(3.61)	(3.60)
FIRSTMidQUALITY-FIRSTLowQUALITY	-0.224		0.189		-0.838	
(F-statistic)	(1.30)		(0.59)		(0.55)	
FIRSTHighQUALITY-FIRSTMidQUALITY	0.072		-1.924*		-0.792	
(F-statistic)	(1.11)		(3.25)		(0.84)	

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

Table 6: Alternative Measures of CSR Report Quality

Panel A: Descriptive Statistics

Mean	No CSR	CSR Report Quality (QUALITY)		
(Median)	Report	Low	Mid	High
GRI FORMAT	0	0.0441**	0.3148***	0.5339***
KLDQUAL_STRENGTH	0.0035	0.1029***	0.2010***	0.4110***
KLD QUAL_CONCERN	0.0003	0**	0**	0**

Panel B: Regression Results of CSR Performance on Alternative Measures of CSR Report Quality

	KLDSTRENGTH		KLDCONCERN	
LowQUALITY	3.067***	2.490***	1.003***	0.787***
	(5.79)	(5.88)	(3.57)	(2.67)
MidQUALITY	3.094***	2.499***	1.579***	1.357***
	(8.38)	(8.47)	(6.26)	(5.18)
HighQUALITY	3.626***	2.620***	2.353***	1.974***
	(7.64)	(7.28)	(6.89)	(5.59)
GRI FORMAT	1.271***	0.412*	0.450**	0.124
	(5.60)	(1.89)	(2.26)	(0.64)
KLDQUAL_STRENGTH		3.076***		1.172***
		(7.81)		(4.27)
KLDQUAL_CONCERN		-1.244***		5.241***
		(-6.86)		(3.64)
Firm characteristics	Yes	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes	Yes
Adjusted R^2	44.3%	48.3%	36.8%	37.8%
N	17,707	17,707	17,707	17,707
MidQUALITY-LowQUALITY	0.559***	0.130***	1.350***	1.187***
(F-statistic)	(31.53)	(30.92)	(23.80)	(15.66)

Panel C: Regression Results of Forecast Errors on Alternative Measures of CSR Report Quality

	FERROR(0)		FERROR(1)		FERROR(2)	
LowQUALITY	-0.043	-0.026	-0.596	-0.601	0.549	0.596
	(-0.12)	(-0.07)	(-0.58)	(-0.58)	(0.51)	(0.56)
MidQUALITY	-0.369*	-0.353*	-1.087	-1.096	-0.441	-0.401
	(-1.90)	(-1.90)	(-1.53)	(-1.55)	(-0.66)	(-0.62)
HighQUALITY	-0.384	-0.349	-1.636**	-1.647**	-1.249	-1.152
	(-1.44)	(-1.36)	(-2.04)	(-2.06)	(-1.47)	(-1.38)
GRI FORMAT	-0.283**	-0.242*	-0.985***	-0.986***	-1.068*	-0.952
	(-2.07)	(-1.79)	(-2.62)	(-2.63)	(-1.76)	(-1.57)
KLDQUAL_STRENGTH		-0.173		-0.010		-0.498
		(-0.90)		(-0.02)		(-0.71)
KLDQUAL_CONCERN		-2.360***		-6.769***		-12.899***
		(-2.59)		(-4.48)		(-3.13)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	13.3%	13.3%	17.1%	17.1%	20.2%	20.2%
N	15,874	15,874	15,405	15,405	12,034	12,034
HighQUALITY - LowQUALITY	-0.341	-0.323	-1.040**	-1.046**	1.798	-1.748
(F-statistic)	(1.18)	(1.05)	(3.13)	(3.19)	(1.94)	(1.77)

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, and High quality CSR 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.