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# Impression Management in Sustainability Reports: An Empirical Investigation of the Use of Graphs

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**ABSTRACT:** The purpose of this paper is to investigate whether firms use graphs in their sustainability reports in order to present a more favorable view of their social and environmental performance. Further, because prior research indicates that companies use social and environmental disclosure as a tool to reduce their exposure to social and political pressures (the legitimacy argument), we also examine whether differences in the extent of impression management are associated with differences in social and environmental performance. Based on an analysis of graphs in sustainability reports for a sample of 77 U.S. companies for 2006, we find considerable evidence of favorable selectivity bias in the choice of items graphed, and moderate evidence that where distortion in graphing occurs, it also has a favorable bias. Our results regarding the relation between impression management and performance are mixed. Whereas we find that graphs of social items in sustainability reports for companies with worse social performance exhibit more impression management, no significant relation between environmental performance and impression management in the use of environmental graphs is found. Overall, our results provide additional evidence that corporate sustainability reporting, as it currently exists, appears to be more about fostering positive public relations than providing a meaningful accounting of the social and environmental impacts of the firm.

**Keywords:** graphs; impression management; legitimacy; sustainability reporting.

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# INTRODUCTION

The last decade has seen rapid growth in the use of stand-alone reports, often referred to as "sustainability reports," for reporting on corporate social and environmental performance (Adams and Narayanan 2007; Ballou et al. 2006; Bebbington et al. 2008; Erusalimsky et al. 2006). Stand-alone sustainability reporting offers substantial potential benefit (Unerman et al. 2007), and mainstream accounting researchers (e.g., Ballou et al. 2006; Dhaliwal et al. 2011) laud the documents as tools of increased corporate transparency and accountability. However, the rise of sustainability reporting, largely due to its voluntary nature, has also been criticized as little more than attempts at public relations (Milne and Gray 2007). As noted by Merkl-Davies and Brennan (2007), non-regulated disclosure (as is the case with stand-alone sustainability reporting) increases the potential for corporations to engage in impression management.

In this study, we seek to further assess the objectivity of corporate social reporting by identifying whether corporations use one potential tool of impression management, graphs, in their sustainability reports to present a more favorable view of their social and environmental performance. We also attempt to determine whether the use of graphs for impression management varies across social and environmental performance and, thus, can be explained using legitimacy theory. We base our expectations on findings from prior research into corporate use (and abuse) of graphs, which has mainly examined data from financial reports.[1] This prior research (e.g., Beattie and Jones 1992, 1997, 1999, 2000a, 2000b, 2002; Beattie et al. 2008; Courtis 1997; Godfrey et al. 2003; Mather et al. 2000; Muino and Trombetta 2009; Steinbart 1989) documents, in addition to substantial variation in the number of graphs included and the items displayed in this manner, two major findings suggesting corporations use graphs as tools of impression management. First, selectivity in the use of graphs is consistently shown to be positively associated with firm and/or item performance, and second, where distortion in graph depiction occurs, it tends to portray a view that is more favorable than the underlying financial data suggest. These findings hold relative to the corporate use of graphs across both countries (Beattie and Jones 1997, 2000b) and time (Beattie and Jones 2000a). Thus, as summarized by Beattie and Jones (1999, 47), the use of graphs in financial reports appears to be part of an impression management approach designed to "present information in set ways to legitimize to the user of the annual report the management's right to run the company." We extend this research to the corporate use of graphs in stand-alone sustainability reports.

Based on a review of 77 stand-alone sustainability reports issued by corporations from the United States for 2006, we find, first, considerable evidence of selectivity bias in the choice of items graphed. The overwhelming majority of graphs, in total and by separate sustainability area (social, environmental, and financial), portray items exhibiting favorable performance trends. We also find moderate evidence of favorability bias with respect to the use of materially distorted graphs. The results of our investigation of the relation between impression management in the use of graphs and ratings of social and environmental performance are more mixed. We find companies rated as worse social performers include more favorable social item graphs, have higher levels of selectivity bias, have a higher level of materially distorted graphs with favorable bias, and exhibit higher levels of favorable graph distortion overall than better-performing counterparts. In contrast, we find no significant relations between environmental performance and differences across the selectivity and distortion bias measures.

[1] With the exception of Mather et al. (2000), who examine graph usage in initial public offering (IPO) prospectuses, and of Beattie and Jones (1994), who investigate graph usage in charity organization annual reports, all of the prior work focuses on the use of graphs in corporate annual reports.

Overall, the results of our investigation indicate that trends in graph use, and misuse, in U.S. corporate sustainability reports is comparable to what has been found regarding the use of graphs in financial reports. Importantly, the findings with respect to impression management suggest that management appears to be systematically manipulating the visual presentation of social and environmental information so as to project a favorable image of the firms' sustainability performance. Our results, thus, provide additional evidence that corporate sustainability reporting, as it currently exists, appears to be more about fostering positive public relations than providing a meaningful accounting of the social and environmental impacts of the firm.

# BACKGROUND AND JUSTIFICATION FOR THE STUDY

## Stand-Alone Sustainability Reporting

As noted by Milne and Gray (2007), sustainability reporting has evolved over the relatively recent past from nothing more than disclosures on environmental and social policies and impacts included in annual financial reports to stand-alone combined reports including social, environmental, and economic/financial information reflecting what Elkington (1997) refers to as triple bottom line reporting.[2] The issuance of sustainability-type reports has become almost ubiquitous among the world's largest corporations. KPMG International reports in its 2008 survey of sustainability reporting, for example, that nearly 80 percent of the Global 250 companies now issue such reports (KPMG International 2008, 13).

The rise in stand-alone sustainability reporting is potentially a positive trend. As noted by Unerman et al. (2007, 3), "just as conventional management and financial accounting has been a powerful tool in the management, planning, control and accountability of the economic aspects of organizations, broader techniques of sustainability accounting and accountability" can be powerful tools for addressing the impacts of firms' social and environmental actions. At least some audiences appear to believe that the reporting is indeed about greater transparency and accountability. Ballou et al. (2006, 65–66) note, for example, that many companies are now creating "transparent reports that provide accurate and reliable data, as well as a fair picture of overall performance" . . . "across the 'triple bottom line' of economic, environmental, and social performance." Similarly, Dhaliwal et al. (2011, 63), in their investigation of the impact of corporate social responsibility reporting (CSR) on firms' cost of capital, claim:

> a firm's voluntary compilation and publication of standalone CSR reports demonstrates its special effort and commitment to improving transparency regarding long-term performance and risk management. More importantly, compared with CSR information provided in annual reports or 10-Ks, standalone CSR reports are more comprehensive and contain significantly more details. Therefore, standalone CSR reports likely provide incrementally useful information for investors to evaluate firms' long-term sustainability.

However, Unerman et al. (2007, 3) also acknowledge that many critics of the sustainability accounting trend see the reports as little more than public relations tools designed to "win (or maintain) the approval of those stakeholders whose continued support is crucial for the survival and profitability of the business." The choice to issue a stand-alone sustainability report is voluntary, and

[2] Milne and Gray (2007) note that although these reports are often referred to as sustainability reports, it is highly questionable whether even the best of the triple bottom line reports really reflect the concept of sustainability. This vein of this criticism is beyond the scope of our investigation.

although organizations such as the Global Reporting Initiative (GRI) and Sustainability/UNEP offer guidance and recommendations for disclosure, there are no requirements or regulations for this reporting in the United States. Merkl-Davies and Brennan (2007, 118) argue that non-regulated disclosure increases "the opportunity for impression management."

## Impression Management

Godfrey et al. (2003, 96) claim that impression management "occurs when management selects the information to display and presents that information in a manner intended to distort readers' perceptions of corporate achievement." Following Prakash and Rappaport (1977), Merkl-Davies et al. (2011) suggest that managers engage in impression management with the expectation that stakeholders will respond in less undesired ways to corporate behaviors described in the companies' narrative documents. Merkl-Davies et al. (2011, 318) further argue impression management construction can be accomplished by emphasizing positive outcomes (enhancement) and/or by obfuscating negative performance (concealment) so as to present an inaccurate view of organizational outcomes (self-presentational dissimulation).

A number of impression management techniques are used by organizations in an attempt to maintain or enhance their image (see, e.g., Elsbach and Sutton 1992; Elsbach 1994; Ginzel et al. 1992; Livesey and Kearins 2002; Cho 2009). Merkl-Davies and Brennan (2007), based on their extensive review of the impression management literature, note that one of these strategies includes visual and structural manipulation. Our concern is that corporations may be systematically using graphs in their sustainability reports to bias, in a favorable way, stakeholders' perceptions of their social and environmental performance. Such a position would appear to be bolstered by findings from the legitimacy-based research into corporate environmental disclosure.

The legitimacy theory arguments of Dowling and Pfeffer (1975), Deegan (2002), Cho and Patten (2007), Cho (2009), and others claim that when corporations face potential threats to their social or environmental legitimacy, they have an incentive to use communication strategies to attempt to influence the perceptions of their relevant publics. More specifically, within the environmental domain, both Patten (2002) and Cho and Patten (2007) present evidence suggesting that companies with worse environmental performance tend to make more extensive disclosure of potentially mitigating environmental disclosures. More recently, Cho et al. (2010) show that aside from the extent of disclosure, companies that are worse environmental performers also manipulate the use of the language in their environmental disclosures, at least in part, to apparently obfuscate their poorer performance.

Just as corporations appear to manipulate narratives (e.g., Cho et al. 2010; Warsame et al. 2002), visuals (e.g., Davison 2010), and graphs (e.g., Beattie and Jones 2008; Penrose 2008) in financial reports,[3] they may also be using impression management techniques in their sustainability reports to project a more favorable image of their social and environmental performance. Therefore, in this paper, we investigate an unexplored issue—whether companies use graphs in their stand-alone sustainability reports in a manner designed to present the firm in a more favorable way, and whether the use of impression management graph techniques can be explained through the lens of legitimacy theory.[4] We continue our analysis by discussing the power of graphs as a tool of communication and the main results noted in relevant prior studies.

[3] See Merkl-Davies and Brennan (2007) for a more detailed discussion of impression management.

[4] Such extensions appear to fit well with the calls of Beattie and Jones (2008) relative to the overall graph research agenda.

## The Power of Graphs and Prior Research

Graph usage in financial reports has received considerable research attention due to its power as a communication device. Beattie and Jones (2000a) summarize the potential value of using graphs to present data. They note that graphs can improve the effectiveness of information conveyance, as "they rely on spatial, rather than linguistic, intelligence" (Beattie and Jones 2000a, 216). Because, according to Ackerman (1991), the visual sense is the most dominant, graphs allow users to "see" the data, making the communication process "more direct and immediate" (Beattie and Jones 2000a, 216). Furthermore, prior evidence (e.g., Hines 1982) suggests annual reports tend not to be thoroughly read by users. Beattie and Jones (1992, 291) note that because "human capacity to remember visual patterns is superior to memory for text or numerical tabulations,"[5] graphs included in the reports are more likely to be remembered. Unfortunately, the power of graphs as tools of communication also leads to potential abuses, including, in particular, misrepresentation of the underlying data.

Graphical depictions, according to Steinbart (1989, 61), are "accurate to the extent they lead viewers to form conclusions consistent with those that would result from more formal quantitative analysis of the data." More formally, Tufte (1983, 56) argues that in order to be considered accurate, the surface depiction of the graph must be directly proportional to the underlying numerical values being represented. Violation of this principle leads to what Beattie and Jones (1992, 293) refer to as "measurement distortion." Such distortion, whether due to non-zero axes, broken axes, or non-arithmetic scales, can be used to overstate positive trends or understate negative trends in the underlying data. Experimental research (e.g., Taylor and Anderson 1986; Arunachalam et al. 2002; Beattie and Jones 2002) suggests that users are indeed misled by such distortions.

A considerable body of prior accounting research[6] (e.g., Beattie and Jones 1992, 1997, 1999, 2000a, 2000b, 2002; Beattie et al. 2008; Courtis 1997; Godfrey et al. 2003; Mather et al. 2000; Muino and Trombetta 2009; Steinbart 1989) focuses on corporate use of graphs in financial reports. And while virtually all of the prior studies show substantial variation in the use of graphs across firms, Muino and Trombetta (2009, 83) argue the two major findings from this research are that graph usage is positively related to improvements in performance, and that where distortion in graph depiction occurs, it tends to portray a more favorable view of corporate performance (relative to the underlying financial data). Each of these findings is consistent with firms using graphs as tools of impression management, and as discussed in the following section, serves as support for our study's hypotheses.

## Hypotheses

The first major finding of the research into corporate use of graphs in financial reports is that the choice to include graphs and the choice of what variables get graphed appear to be associated with positive performance. For example, Steinbart (1989) reports for his sample of U.S. firms that whereas 74 percent of companies with increases in net income included graphs of either sales, income, or dividends, only 53 percent of firms with decreased net income did likewise. Similar relations between positive performance and the choice to include graphs of key financial variables are noted by Beattie and Jones (1992, 1999, 2000b) and Mather et al. (1996), although the latter

[5] Beattie and Jones (1992) cite Paivio (1974) as the source for this claim.

[6] For an extensive review of the literature on graph disclosure, see Beattie and Jones (2008) and Penrose (2008).

study's findings are limited to only smaller firms. Further, and more relevant to our investigation, Beattie and Jones (2000a) report a significant positive relation between changes in financial performance variables and the changes in the inclusion of graphs of those items.

Numerous studies also report both the existence of material measurement distortion in various graphs included in corporate financial reports, and that the distortion, more often than not, presents a picture that is favorable to the firm. Relative to the first of these points, Steinbart (1989) reports that just over 25 percent of the 939 graphs he examined distorted the data by more than 10 percent. Similarly, Beattie and Jones (1992), based on a sample of 465 graphs from U.K. companies' annual reports, find 24 percent with distortion of greater than 10 percent, and Beattie and Jones (1999) indicate that about 28 percent of the 292 graphs included in their sample of Australian companies exhibited distortion at or above the 10 percent level.[7] More recently, Beattie et al. (2008), in a replication of Beattie and Jones' (1992) study, report that nearly half of the financial graphs included in their sample drawn from 2004 U.K. company reports exhibited distortion of greater than 10 percent. Perhaps more troubling than the existence of distortion, Steinbart (1989), Beattie and Jones (1992), and Beattie and Jones (1999) all report that where distortion occurs, it is much more likely to portray the company favorably (either overstatement of a positive trend or understatement of a negative trend) than otherwise. Beattie and Jones (2000b) report similar findings for their analyses of distortion in graphs in their samples of international firms. In their analysis of graphs in Australian IPO prospectuses, Mather et al. (2000) report mixed distortion bias findings.

In contrast to almost all prior research into the corporate use of graphs, we focus not on its use in financial reports, but instead on its use in stand-alone sustainability reporting. Based on the findings of the prior examinations of financial graphs, however, we expect to find, first, evidence of impression management with respect to the graph usage. We more formally state our hypotheses in this regard as:

**H1:** *Ceteris paribus*, a greater proportion of items graphed in sustainability reports will exhibit favorable, as opposed to unfavorable, trends.

**H2:** *Ceteris paribus*, a greater proportion of graphs with material distortion will be biased toward favorable, as opposed to unfavorable, portrayal of company performance.

Beyond just examining for apparent impression management strategies in the use of graphs in sustainability reports, however, we also examine whether differences in impression management are associated with differences in underlying social and environmental performance. Beattie and Jones (2008) note that firms facing legitimacy-threatening issues have an incentive to use communication to address these concerns and, in this context, the communicative effectiveness of the message could be enhanced through the use of graphs. More specifically, we expect companies with worse performance in the social or environmental areas to selectively choose more favorable items to highlight through graphs than their better-performing counterparts, and to be more likely to distort the presentations so as to portray better performance. We formally state these hypotheses as:

[7] Steinbart (1989), Beattie and Jones (1992), and Beattie and Jones (1999) all measure distortion using the graph discrepancy index developed by Tufte (1983). Interestingly, Tufte (1983) suggests that graph discrepancy index (GDI) measures above or below 5 percent should be classified as materially distorted. However, because Steinbart (1989) only reports GDI scores at 10 percent or more, we use that same level of distortion from the data presented by Beattie and Jones (1992, 1999) for this comparative discussion.

**H3:** *Ceteris paribus*, firms with worse social performance will exhibit more use of impression management in their use of graphs of social items in sustainability reports than companies with better performance.

**H4:** *Ceteris paribus*, firms with worse environmental performance will exhibit more use of impression management in their use of graphs of environmental items in sustainability reports than companies with better performance.

# RESEARCH METHODS

## Sample

In order to be included as part of our sample, companies had to have available for review a stand-alone sustainability-type report for 2006, and also had to have social and environmental performance evaluation data available through KLD Research and Analytics, Inc. (hereafter, KLD). A search of CorporateRegister.com and individual company websites resulted in a final sample of 77 U.S. firms. Sample companies ranged in size (based on 2006 revenues) from $1.9 billion to $335.2 billion, with a mean (median) of $33.3 billion ($15.7 billion). Based on a review of CorporateRegister.com, it appears that in terms of both firm size and industry coverage, our sample is representative of the body of U.S. corporations having issued, by the end of 2006, some type of sustainability report. The firms represent 27 different industries (based on two-digit primary Standard Industrial Classification [SIC] codes), with the largest representation, 13 companies, coming from utilities (SIC 49XX).[8] With respect to the reports, 34 were prepared using GRI recommendations, but only five were subjected to external attestation. A list of sample companies is available from the authors.

## Use of Graphs in Sustainability Reports

Table 1 presents data on the use of graphs in the sustainability reports for our sample firms. As noted in Panel A of the table, 59 of the companies included at least one graph of a social performance item, and 55 firms graphed at least one environmental item. In contrast, only 33 of the 77 reports contained graphs of financial items. Overall, 68 of the 77 sample companies included at least one graph in their 2006 sustainability report. Table 1 also identifies the number of graphs by area. Our sample reports contained 342 social graphs, 423 environmental graphs, and 92 financial graphs, for an overall total of 857 graphs. However, because the focus of our study is on selectivity and distortion in the use of graphs, we limit our investigation to line and column graphs depicting multi-year data. As also summarized in Table 1, 570 of the graphs meet these criteria and are included in our analysis, with a breakdown of 234, 302, and 34 across the social, environmental, and financial areas, respectively.

Panel B of Table 1 identifies the specific social, environmental, and financial items graphed most by our sample firms. Within the social domain, the data items graphed by the most companies, 31 firms, related to employee safety and health issues (e.g., accidents, time lost, fatalities, etc.). In the environmental area, 38 sample companies included at least one time-series graph of substance emissions or releases (e.g., $CO_2$, $SO_2$, TRI, etc.). Finally, sales/revenue data was the financial item most commonly graphed, although only 11 firms included such presentations in their sustainability reports.

[8] Because utility companies make up a fairly large proportion of the overall sample (16.9 percent), it is possible that the results we present could be driven by these firms. As such, we repeated all analyses deleting the utility firms. The results of these tests were comparable to those using the full sample, and are not presented here.

**TABLE 1**

**Use of Graphs in Sustainability Reports**

**Panel A: Graphs by Area**

| | Social Items | Environmental Items | Financial Items | Total |
|---|---|---|---|---|
| Reports containing a graph | 59 | 55 | 33 | 68 |
| Total number of graphs | 342 | 423 | 92 | 857 |
| Measurable time-series graphs | 234 | 302 | 34 | 570 |

**Panel B: Items Graphed by Most Companies (Measurable Time-Series Graphs)**

| | Number of Firms |
|---|---|
| Social | |
| Safety and health (injury, incident, illness) | 31 |
| Employee (diversity, geography, turnover, work/life, ethics) | 17 |
| Supplier data | 8 |
| Corporate philanthropy | 8 |
| Environmental | |
| Emissions (GHG, CO2, NOx, SO2, etc.) | 38 |
| Hazardous waste | 20 |
| Energy saving/efficiency | 20 |
| Water | 16 |
| Financial | |
| Sales revenue (geography, segment) | 11 |

## Measures of Impression Management

We examine for potential impression management in the use of graphs in our sample of sustainability reports across two domains. First, we investigate whether there is favorable bias in the choice of items graphed.[9] For this stage of the analysis, we identify whether the first and last observations on the time-series graph reflect a favorable or an unfavorable underlying trend. Favorable trends include increasing arrays for items where increases are indicative of positive social, environmental, or financial performance, and would include items such as the percentage of management positions held by minority classes, the amount of material recycled, or company net income. Where decreased levels represent better performance (for example, the amount of greenhouse gas emissions or the number of worker safety violations reported), decreases in the trend are classified as favorable. Unfavorable trends are the opposite of those considered favorable, and would include, for example, decreases in net income or increases in the level of greenhouse gas emissions. In addition to identifying the number of graphs with favorable bias, we also examine, for those companies including graphs within each respective sustainability area, the degree of selectivity bias. We calculate the degree of selectivity bias, by company, as the number of favorable item graphs within a specific sustainability domain (social, environmental, or financial) divided by the total number of graphs the company includes in that area.

[9] Favorable selection bias represents what Merkl-Davies et al. (2011) refer to as enhancement, the emphasis of items with positive performance.

Our second measure of potential impression management in the use of graphs centers on distortion. We measure graph distortion using the relative graph discrepancy (RGD) index. Mather et al. (2005) developed this metric to overcome severe limitations inherent in the use of the graph discrepancy index (GDI) employed in most of the prior studies of graph distortion (e.g., Beattie and Jones 1992, 1997, 1999, 2000a, 2000b, 2002; Courtis 1997).[10] RGD is defined as:

$$RGD = \left(\frac{g_2 - g_3}{g_3}\right),$$

where $g_2$ is the height of the last column in the graph, and $g_3$ is the correct height of the last column if plotted accurately, i.e.:

$$g_3 = \frac{g_1}{d_1} * d_2,$$

where:

$g_1$ = height of first column (graph);
$d_1$ = value of first data point (corresponding to the first column); and
$d_2$ = value of last data point (corresponding to last column).

Mather et al. (2005) argue that *RGD* is a better measure of graph distortion because (1) it is consistent within the range of expected input values and it is linear, (2) the issue of sensitivity to small changes in large data does not arise, since the graph is scaled to represent the data, and (3) the only discontinuity in the function is when the last data point is zero. When there is no distortion, the *RGD* measure takes a value of 0, indicating the change observed in the data is correctly portrayed in the graph. *RGD* is positive when an increasing trend is overstated or when a negative trend is understated. The measure takes negative values when increasing trends are understated or decreasing trends are exaggerated.

| Trend in Data | Nature of Distortion | *RGD* |
|---|---|---|
| Increasing | Exaggeration | $>0$ |
| Decreasing | Understatement | $>0$ |
| Increasing | Understatement | $<0$ |
| Decreasing | Exaggeration | $<0$ |

Similar to the classification of graph selectivity, distortion bias is considered favorable when it exaggerates an increase or understates a decrease for items where increases represent positive performance (e.g., net income or percentage of waste recycled). Distortion is also classified as favorable when increasing trends are understated or decreasing trends are exaggerated for items where increases represent negative performance (e.g., the amount of greenhouse gas emissions).[11] Following Mather et al. (2005) and Muino and Trombetta (2009), we choose a cutoff point of 2.5 percent as our threshold for classifying graphs as materially distorted.[12]

[10] See Mather et al. (2005) for a discussion of the limitations of the GDI measure.

[11] Favorable distortion in the graph presentation aligns with Merkl-Davies et al.'s (2011) obfuscation classification in that the companies are presenting an inaccurate view of company outcomes.

[12] Mather et al. (2005) claim that a 2.5 percent *RGD* is essentially equivalent to a 5 percent GDI distortion, the level Tufte (1983) recommends as a materiality threshold.

In addition to identifying, for each firm, the number of graphs with favorable material distortion, we calculate a measure of overall favorable graph distortion by company and area for firms including social and/or environmental graphs. More specifically, we follow Muino and Trombetta (2009, 90) and measure the level of favorable distortion as *RGDFAV*, where:

$$RGDFAV = \sum |rgd\ fav_j|/n,$$

where:

$|rgd\ fav_j|$ = absolute value of the *RGD* index for graph *j* in the sustainability report, but where $rgd\ fav_j$ is set to 0 when graph *j* is distorted to portray a more unfavorable view of the company; and

$n$ = total number of graphs within the specific sustainability category included in the report.

We calculate separate *RGDFAV* measures relative to the use of social and environmental graphs. Finally, we also follow Muino and Trombetta (2009) and use the fractional ranks of the distortion measures for all analyses. The fractional ranks are calculated by dividing the rank of a firm's *RGDFAV* by the number of companies including a graph within social or environmental area, respectively.
We test for differences in (1) the number of graphs depicting favorable trends, (2) the degree of selectivity bias, (3) the number of materially distorted graphs with a favorable bias, and (4) the degree of favorable distortion bias, partitioned on firm social and environmental performance (discussed below), respectively. We use t-tests of means to assess the statistical significance of differences across the four measures for each area (social and environmental).[13]

## Measures of Performance

KLD Research Analytics, Inc.[14] independently rates thousands of companies traded on U.S. stock exchanges in terms of their social and environmental performance (SEP) across a range of dimensions related to stakeholder concerns. The company draws upon a variety of sources to capture relevant SEP data (Waddock and Graves 1997; Hillman and Keim 2001). Because the KLD database provides a quantifiable and enhanced corporate SEP measure and preserves its independent rating system (Hillman and Keim 2001), the KLD data have been used extensively in U.S. management research on corporate social and environmental performance issues (e.g., Waddock and Graves 1997) and, more recently, in social and environmental accounting research (see, e.g., Cho et al. 2006, 2010; Cho and Patten 2007; Dhaliwal et al. 2011).

Given the apparent benefits of the KLD ratings,[15] we use this database to identify differences in social and environmental performance across our sample firms. KLD separately assigns strengths and concerns across several SEP categories, and gives a score of 0 or 1 for each of the strength and concern areas included in a particular category. For social performance, we include the "community," "diversity," "employee relations," and "product" categories; for environmental

[13] We repeat all tests of means using a nonparametric Mann-Whitney test. Results in all cases were qualitatively comparable to those reported in the paper.

[14] The professional services firm of KLD Research and Analytics, Inc. is located at 250 Summer Street, Boston, MA 02210, U.S.A., and has, since 1994, maintained a database with independent ratings of corporate social performance. KLD's social research is distributed in SOCRATES, which is a proprietary database program that provides access to KLD's ratings and other data pertaining to the social records of over 3,000 publicly traded U.S. companies (KLD Research and Analytics, Inc. 2003).

[15] The KLD ratings are not without criticism. For an overview of the strengths and weaknesses of the measure, see, e.g., Chatterji et al. (2009).

performance, KLD provides a specific "environment" category. KLD analyzes corporate social and environmental performance based on an extensive assessment of each firm's activities in these domains. The social performance measure is determined by taking the net score of total social strengths and total social concerns, and we label it "net KLD social score." Similarly, the environmental performance measure is represented by the net score of total environmental strengths and total environmental concerns, and we label it "net KLD environmental score." Net KLD social scores for our sample firms ranged from −5 to 9, with a mean score of 0.84, whereas net KLD environmental scores ranged from −5 to 4, with a mean score of −0.55.

### Legitimacy Control Variables

As noted by Patten (2002), almost all studies of social and environmental disclosure document that the extent of disclosure is positively related to both firm size and industry sensitivity. Larger firms and companies from industries facing greater exposures to social or environmental pressures appear to use disclosure as a tool for addressing legitimacy concerns in these areas. Although our investigation focuses on the relation between impression management in the use of graphs and underlying social and environmental performance, it seems necessary to control for potential impacts from firm size and industry sensitivity effects (see, e.g., Freedman and Stagliano 2008; Wilson and Zabriskie 2010). We measure firm size as the natural log of 2006 revenues. Because industry sensitivity likely varies across the social and environmental domains, we use two separate measures of industry sensitivity. Following Brammer and Millington (2005), we classify firms from the extractive (mining and petroleum), chemical, paper, pharmaceutical, alcoholic beverages, and defense industries as facing greater social exposures. Based on prior studies focusing only on environmental disclosure (e.g., Cho and Patten 2007; Freedman and Wasley 1990; Freedman et al. 2004), we classify companies from the chemical, mining, metals, paper, petroleum, and utility industries as environmentally sensitive. We use multiple regression analysis to test for the relation between performance level (worse versus better)[16] and our measures of impression management, controlling for other legitimacy effects.

Table 2 provides descriptive data on the variables used in our study, while Table 3 identifies Pearson product-moment correlations across the variables.

## ANALYSES AND RESULTS

### Impression Management—Selectivity

The first goal of our investigation is to determine whether, consistent with findings from the research into graph usage in financial reports, companies appear to use the graphs as tools of impression management. We begin by examining the selectivity of items graphed. As reported in Table 4, there is clear evidence of favorable bias in the selectivity of items graphed. Overall, 451 of the 570 graphs (79.1 percent) reflect items with a favorable trend. The favorable bias holds across all three subcategories of disclosure. Favorable bias percentages are 80.3 percent for social item graphs, 77.5 percent for graphs of environmental items, and 85.3 percent for the graphs depicting financial information. Binomial probability tests indicate the difference in proportion (favorable versus unfavorable) is statistically significant (at $p \leq 0.001$) for all comparisons. H1 is, thus, supported.

[16] As we discuss in the sensitivity tests section, we rerun all regressions replacing the dichotomous performance variable with the net KLD score (social or environmental).

**TABLE 2**

**Descriptive Data**

| Item | n | Min. | Max. | Mean | Std. Dev. |
|---|---|---|---|---|---|
| Firm Size (2006 Revenues in $billion) | 77 | $1.9 | $335.2 | $33.30 | 54.12 |
| Social Graphs—by Company | 77 | 0 | 59 | 3.08 | 7.15 |
| Environmental Graphs—by Company | 77 | 0 | 27 | 3.81 | 5.27 |
| Financial Graphs—by Company | 77 | 0 | 10 | 0.43 | 1.35 |
| Selectivity Bias—Social Graphs | 50 | 0 | 100.0 | 87.47 | 24.06 |
| Selectivity Bias—Environmental Graphs | 47 | 0 | 100.0 | 81.56 | 24.41 |
| Distortion Bias (*RGDFAV*)—Social | 50 | 0 | 19.42 | 1.90 | 3.66 |
| Distortion Bias (*RGDFAV*)—Env. | 47 | 0 | 12.57 | 1.44 | 2.29 |
| Industry Sensitivity—Social | 77 | 0 | 1.00 | 0.32 | 0.47 |
| Industry Sensitivity—Env. | 77 | 0 | 1.00 | 0.47 | 0.50 |
| KLD Social Score | 77 | −5 | 9 | 0.84 | 2.82 |
| KLD Environmental Score | 77 | −5 | 4 | −0.55 | 1.69 |

## Impression Management—Graph Distortion

The next stage of our analysis focuses on the incidence of graph distortion and whether, where it exists, the distortion appears also to be used as a tool of impression management. Panel A of Table 5 identifies the distribution of *RGD* scores for our sample of graphs, while Panel B summarizes the incidence of favorable versus unfavorable material distortion. As highlighted in Panel A of the table, 125 of the 570 graphs (21.9 percent) contain material distortion. This is somewhat lower than the percentage of materially distorted graphs reported by Beattie and Jones (1992) and Beattie and Jones (1999) relative to graphs of key financial items in the U.K. and Australia, respectively, and is substantially lower than the 63 percent level of distorted graphs reported by Mather et al. (2000) for non-key financial variables in Australian IPOs. It is also substantially lower than the level of distortion reported by Beattie et al. (2008) for their 2004 U.K. sample. Overall, 74 of the 125 materially distorted graphs (59.2 percent) are distorted so as to present a more favorable view of the trend, whereas 51 graphs exhibit unfavorable bias. This difference in proportions is statistically significant (based on a binomial probability test) at $p = 0.025$, one-tailed. Panel B also shows the breakdown of favorable versus unfavorable bias across the materially distorted graphs for each sustainability area. While both the social and the environmental areas reflect a higher percentage of favorably, as opposed to unfavorably, materially distorted graphs, the difference in proportion is not statistically significant at conventional levels for the environmental category. Only one of the 34 financial graphs is materially distorted, and its direction of bias is unfavorable. In general, these results are consistent with H2 and provide moderate evidence that our sample companies used distortion to favorably manipulate the impression of sustainability performance across the social and environmental domains.

## Impression Management and Performance—Social

We examine next whether the impression management in the use of graphs in sustainability reports appears to be due to attempts at legitimization. For this stage of the analysis, we focus on only social and environmental item graphs, beginning with the social domain. Our first set of tests, summarized in Table 6, identifies differences in the use of social graphs across worse and better social performers. Worse performers are those with a net KLD social score less than zero,

**TABLE 3**

**Pearson Correlations**

| Variable | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Favorable Social Graphs | 1 | −0.069 | 0.563* | 0.183 | 0.084 | −0.353** | 0.036 | 0.111 | −0.166 | −0.042 | 0.206 | 0.111 | 0.058 |
| 2. Selection Bias—Social | | 1 | 0.008 | 0.198 | −0.070 | −0.137 | 0.177 | 0.147 | −0.295* | −0.261 | 0.175 | 0.240 | 0.277 |
| 3. Favorably Distorted—Social | | | 1 | 0.515* | 0.052 | −0.394* | 0.090 | 0.071 | −0.170 | 0.108 | 0.049 | 0.078 | 0.093 |
| 4. Degree of Distortion—Social | | | | 1 | 0.079 | −0.138 | −0.033 | −0.053 | −0.211 | 0.134 | 0.203 | −0.020 | 0.114 |
| 5. Favorable Env. Graphs | | | | | 1 | 0.138 | 0.447* | 0.147 | 0.025 | −0.041 | 0.282** | 0.029 | 0.182 |
| 6. Selection Bias—Env. | | | | | | 1 | −0.054 | 0.120 | 0.000 | 0.207 | −0.267 | −0.126 | −0.102 |
| 7. Favorably Distorted—Env. | | | | | | | 1 | 0.700* | 0.110 | 0.026 | 0.023 | 0.019 | 0.220 |
| 8. Degree of Distortion—Env. | | | | | | | | 1 | 0.172 | 0.135 | −0.009 | 0.152 | 0.060 |
| 9. Social KLD Score | | | | | | | | | 1 | 0.250** | 0.026 | 0.009 | −0.106 |
| 10. Env. KLD Score | | | | | | | | | | 1 | −0.305* | −0.188 | −0.393* |
| 11. Firm Size | | | | | | | | | | | 1 | 0.213 | −0.036 |
| 12. Ind. Sensitivity—Social | | | | | | | | | | | | | 0.518* |
| 13. Ind. Sensitivity—Env. | | | | | | | | | | | | | 1 |

*, ** Significant at $p < 0.01$ and $p < 0.05$, respectively, two-tailed.

**TABLE 4**

**Bias in the Selection of Items Graphed**

| | Social Graphs | Environmental Graphs | Financial Graphs | Total |
|---|---|---|---|---|
| Favorable Trend | 188 (80.3%) | 234 (77.5%) | 29 (85.3%) | 451 (79.1%) |
| Flat or Unfavorable Trend | 46 (19.7%) | 68 (22.5%) | 5 (14.7%) | 119 (20.9%) |
| Binomial Z-ratio | 9.22 | 9.49 | 3.94 | 13.86 |
| Significance[a] | <0.001 | <0.001 | <0.001 | <0.001 |

[a] Significance levels are two-tailed.

whereas better performers are firms with net KLD social scores of zero and above. As noted in Table 6, the worse performers, on average, included more graphs depicting favorable trends, had higher levels of selectivity bias, included more materially distorted graphs with a favorable bias, and had higher levels of overall favorable distortion bias in their social graphs than the better

**TABLE 5**

**Graph Distortion**

**Panel A: Frequency Distribution of Relative Graph Discrepancy Scores (Distortion)**

| Relative Graph Discrepancy (%) | No. | % |
|---|---|---|
| $RGD \leq -25$ | 9 | 1.6 |
| $-25 < RGD \leq -5$ | 30 | 5.3 |
| $-5 < RGD \leq -2.5$ | 31 | 5.4 |
| $-2.5 < RGD \leq 2.5$ | 445 | 78.1 |
| $2.5 < RGD \leq 5$ | 15 | 2.6 |
| $5 < RGD \leq 25$ | 28 | 4.9 |
| $RGD > 25$ | 12 | 2.1 |

Total materially distorted graphs[a] = 125

**Panel B: Bias in the Use of Materially Distorted Graphs[a]**

| | Social | Envir. | Financial | Total |
|---|---|---|---|---|
| Favorable Distortion | 38 (61.3%) | 36 (58.1%) | 0 (0%) | 74 (59.2%) |
| Unfavorable Distortion | 24 (38.7%) | 26 (41.9%) | 1 (100%) | 51 (40.8%) |
| Binomial Z-ratio | 1.65 | 1.14 | ** | 1.97 |
| Significance[b] | 0.050 | 0.127 | ** | 0.025 |

** Unable to calculate a binomial Z-ratio.

[a] Materially distorted graphs are those with an absolute value of $RGD \geq 2.5$.

[b] Significance levels are one-tailed.

**TABLE 6**

**Relation of Impression Management in the Use of Social Graphs to Differences in Social Performance**

| | n | Mean | t-stat | Significance[a] |
|---|---|---|---|---|
| Number of Social Graphs Depicting a Favorable Trend (n = 77) | | | | |
| Worse social performers[b] | 24 | 4.13 | | |
| Better social performers | 53 | 1.68 | 2.015 | 0.024 |
| Degree of Selectivity Bias—Companies with Social Graphs (n = 50) | | | | |
| Worse social performers[b] | 17 | 94.26 | | |
| Better social performers | 33 | 83.98 | 1.448 | 0.077 |
| Number of Social Graphs with Favorable Distortion Bias (n = 77) | | | | |
| Worse social performers[b] | 24 | 1.08 | | |
| Better social performers | 53 | 0.23 | 2.557 | 0.006 |
| Degree of Distortion Bias—Companies with Social Graphs (n = 50) | | | | |
| Worse social performers[b] | 17 | 65.65 | | |
| Better social performers | 33 | 41.76 | 2.982 | 0.003 |

[a] Significance levels are one-tailed.

[b] Worse performers are companies with a net KLD social score less than 0. Better performers are companies with a net KLD social score greater than or equal to 0.

performers. All differences are statistically significant at better than the $p = 0.08$ level, one-tailed, and the comparisons regarding distortion are significantly different at $p < 0.01$, one-tailed.

Table 7 presents the results of our regression analyses of the relation between impression management measures for the social graphs and social performance, controlling for potential firm size and industry sensitivity effects. With the exception of firm size in the "number of favorable trend graphs" and "degree of distortion bias" models (both at $p < 0.10$, one-tailed) and industry sensitivity in the "degree of selectivity bias" model (at $p < 0.05$, one-tailed), the legitimacy control variables are not significantly associated with differences in the use of impression management techniques for the social graphs. Overall, the models explain relatively little of the variation in the impression management measures (adjusted $R^2$ levels range from 0.055 to 0.121 for the four models), and we address this issue in sensitivity tests discussed below. Importantly, however, and consistent with the Table 6 results, the worse performer measure is significantly (at $p < 0.05$, one-tailed) and positively related to all four measures of impression management. Our tests, thus, provide fairly substantial evidence that companies with worse social performance (as measured by net KLD social scores) exhibit more use of impression management to project favorable impressions than do their better-performing counterparts. These results, thus, support H3.

## Impression Management and Performance—Environmental

In contrast to the relations reported for social item graphs, we find no evidence of a relation between environmental performance and the use of impression management in environmental graphs. Although worse environmental performers include slightly more graphs depicting favorable trends and slightly more materially distorted graphs with a favorable bias than companies with better performance (see Table 8), neither difference is statistically significant at conventional levels. Further, both the degree of selectivity bias and the degree of distortion bias are actually

**TABLE 7**

**Results of Regression Analysis of the Relation between Social Performance and Impression Management in the Use of Social Graphs Controlling for Firm Size and Industry Sensitivity**

| | Dependent Variable | | | |
|---|---|---|---|---|
| | # of Graphs with Favorable Selectivity | Degree of Selectivity Bias | # of Graphs with Favorable Distortion | Degree of Distortion Bias |
| Constant | −17.091 | 28.857 | −0.246 | −84.417 |
| (t-statistic) | (−1.427) | (0.406) | (−0.079) | (−0.955) |
| Firm size | 0.782 | 2.097 | 0.015 | 5.356 |
| (t-statistic) | (1.527) | (0.691) | (0.111) | (1.419) |
| Ind. sensitivity | 1.049 | 12.155 | 0.295 | −1.113 |
| (t-statistic) | (0.858) | (1.719*) | (0.929) | (−0.127) |
| Worse performer[a] | 2.470 | 12.102 | 0.823 | 23.375 |
| (t-statistic) | (2.042)* | (1.721)* | (2.618)** | (2.671)** |
| n | 77 | 50 | 77 | 50 |
| Adjusted $R^2$ | 0.062 | 0.070 | 0.055 | 0.121 |
| Model F-statistic | 2.661 | 2.223 | 2.477 | 3.258 |
| (significance) | (0.054) | (0.098) | (0.068) | (0.030) |

*, ** Significant at $p < 0.05$ and $p < 0.01$, respectively, one-tailed.

[a] Worse performers are companies with a net KLD environmental score less than 0. Better performers are companies with a net KLD environmental score greater than or equal to 0.

lower for the worse performers than for the better environmental performers, although, again, neither comparison yields statistically significant differences. Results of the regression analyses controlling for other legitimacy variables (presented in Table 9) also indicate no significant relation between differences in environmental performance and the impression management measures.[17] As such, H4 is not supported.

Overall, our analyses find fairly substantial evidence of impression management in the use of graphs in sustainability reports. An overwhelming majority of the items graphed depict favorable trends, and where the presentation is materially distorted, such distortion tends to be in a favorable direction. Our results with respect to whether such impression management is used as a tool of legitimization, however, are mixed. While we find worse social performers exhibit higher levels of impression management than their better-performing counterparts, we find no relation between impression management and differences in environmental performance.

## Sensitivity Analyses

One potential explanation for the high preponderance of favorable item graphs in the sustainability reports is that our sample companies may, on average, be experiencing improve-

[17] As noted in Table 9, we do find that both firm size and industry sensitivity are positively related to the number of graphs depicting favorable trends, and that firm size is also positively associated with the number of materially distorted graphs with favorable bias.

**TABLE 8**

**Relation of Impression Management in the Use of Environmental Graphs to Differences in Environmental Performance**

| | n | Mean | t-stat | Significance[a] |
|---|---|---|---|---|
| Number of Environmental Graphs Depicting a Favorable Trend (n = 77) | | | | |
| Worse environmental performers[b] | 29 | 3.45 | | |
| Better environmental performers | 48 | 2.83 | 0.653 | 0.259 |
| Degree of Selectivity Bias—Companies with Environmental Graphs (n = 47) | | | | |
| Worse environmental performers[b] | 21 | 76.06 | | |
| Better environmental performers | 26 | 82.98 | −0.992 | 0.326 |
| Number of Environmental Graphs with Favorable Distortion Bias (n = 77) | | | | |
| Worse environmental performers[b] | 29 | 0.59 | | |
| Better environmental performers | 48 | 0.40 | 0.703 | 0.243 |
| Degree of Distortion Bias—Companies with Environmental Graphs (n = 47) | | | | |
| Worse environmental performers[b] | 21 | 48.96 | | |
| Better environmental performers | 26 | 52.58 | −0.418 | 0.678 |

[a] Significance levels are one-tailed for the first and third comparisons, and two-tailed otherwise.
[b] Worse performers are companies with a net KLD environmental score less than 0. Better performers are companies with a net KLD environmental score greater than or equal to 0.

ments in social and environmental performance. Along similar lines, it is also possible that the graph usage examined in our study is dominated by companies with improving performance. To examine these possibilities, we identify the change in social and environmental performance for our sample firms by comparing their 2006 KLD scores with those from 2005. As indicated in Table 10, 26 of the 77 sample firms had improved social performance, 19 of the companies had decreased social performance from 2005 to 2006, and 32 firms' evaluations remained the same. Similarly, 20 companies exhibit improved environmental performance scores, 12 show lower environmental performance ratings, and 45 are unchanged. These numbers suggest that our sample is not dominated by companies with improving performance. As also reported in Table 10, the average number of graphs depicting favorable trends is actually lower for the companies with improved performance (for both the social and environmental areas) than for firms with decreased performance scores, although neither set of comparisons yields statistically significant differences. Similarly, no significant differences in selectivity bias exist across the companies with improved, as opposed to decreased, performance in either the social or the environmental domains. Thus, it does not appear that our primary selectivity results are due to trends in underlying social and environmental performance.[18]

Our second set of sensitivity tests centers on relative levels of performance differences. Our primary tests examine only for differences across firms grouped on performance (worse versus

[18] We repeated this analysis using changes in KLD social and environmental scores relative to 2003. One firm was missing 2003 KLD data and, as such, this additional analysis was based on only 76 companies. With the exception that both companies with improved environmental scores and companies with decreased environmental scores included more favorable environmental graphs than firms whose environmental performance ratings remained unchanged relative to 2003, all differences were statistically insignificant.

**TABLE 9**

**Results of Regression Analysis of the Relation between Environmental Performance and Impression Management in the use of Environmental Graphs Controlling for Firm Size and Industry Sensitivity**

| | Dependent Variable | | | |
|---|---|---|---|---|
| | # of Graphs with Favorable Selectivity | Degree of Selectivity Bias | # of Graphs with Favorable Distortion | Degree of Distortion Bias |
| Constant | −24.420 | 225.384 | −0.310 | 41.485 |
| (t-statistic) | (−2.431)* | (2.740)** | (−0.139) | (0.404) |
| Firm size | 1.139 | −5.967 | 0.024 | 0.347 |
| (t-statistic) | (2.668)** | (−1.721)* | (0.250) | (0.080) |
| Ind. sensitivity | 1.805 | −4.070 | 0.399 | 6.313 |
| (t-statistic) | (1.808)* | (−0.504) | (1.798)* | (0.626) |
| Worse performer[a] | −0.494 | −3.015 | 0.004 | −6.260 |
| (t-statistic) | (−0.473) | (−0.380) | (0.016) | (−0.632) |
| n | 77 | 47 | 77 | 47 |
| Adjusted $R^2$ | 0.083 | 0.022 | 0.010 | −0.056 |
| Model F-statistic | 3.295 | 1.258 | 1.342 | 0.187 |
| (significance) | (0.025) | (0.295) | (0.273) | (0.905) |

*, ** Significant at $p < 0.05$ and $p < 0.01$, respectively, one-tailed.

[a] Worse performers are companies with a net KLD environmental score less than 0. Better performers are companies with a net KLD environmental score greater than or equal to 0.

better). In these sensitivity tests, we examine whether differences in the level of performance relate to differences in impression management in the use of graphs. First, as noted in Table 3, the social performance scores are negatively related to the impression management measures (better performers exhibit less impression management), although, with the exception of the degree of selectivity bias ($p = 0.019$, one-tailed), the associations are significant at only $p < 0.10$, one-tailed. Excepting that the social performance score measure is significant at $p < 0.05$, one-tailed, for the degree of distortion bias model, results of non-tabulated regression analyses controlling for firm size and industry sensitivity yield results similar to the correlation analysis. Thus, the dichotomous classification (worse versus better, as opposed to the level of performance) appears to be more strongly associated with the use of impression management in social graph presentation. Neither correlation measures (presented in Table 3) nor results of non-tabulated regressions controlling for firm size and industry sensitivity yield any significant relations between environmental performance scores and measures of impression management in the use of environmental graphs. These results are consistent with the findings based on our dichotomous performance measure.

Our final set of sensitivity tests addresses concerns with the low explanatory power of our regression models. In non-tabulated analyses, we attempt to identify whether other potential factors might be influencing differences in impression management in the use of the graphs. More specifically, we included variables controlling for profitability (2006 return on assets), report quality (companies whose reports followed GRI guidelines), and external attestation. In no cases did these additional variables, either individually or in combination, substantially increase the

**TABLE 10**

**Differences in Graph Selectivity across Changes in Social and Environmental Performance**

| | Number of Graphs Depicting a Favorable Trend | Degree of Selectivity Bias |
|---|---|---|
| Change in Social Performance[a] | | |
| Improved social performance (n = 26) | 1.42 | 90.42 |
| No change in social performance (n = 32) | 3.50 | 86.01 |
| Decreased social performance (n = 19) | 2.21 | 86.22 |
| Change in Environmental Performance[a] | | |
| Improved environmental performance (n = 20) | 3.45 | 78.81 |
| No change in environmental performance (n = 45) | 2.20 | 82.80 |
| Decreased environmental performance (n = 12) | 5.17 | 81.96 |

[a] Change in performance is measured as 2006 net KLD score minus 2005 net KLD score.

explanatory power of the models, and none of the additional variables were statistically significant at conventional levels in any of the regression models.[19] Finally, for the limited sample of 59 companies with 2006 *Fortune* Most Admired scores available, we estimated models including this reputation measure as a control. Again, in no cases was the additional variable statistically significant at conventional levels, and in no cases was the explanatory power of the regression model substantially improved. We discuss the relative lack of explanatory power for the impression management regressions in our concluding section.

# DISCUSSION

The rapid growth in stand-alone reporting on corporate social and environmental performance offers much potential benefit relative to increased transparency and accountability. Unfortunately, the evidence we present above suggests that, at least in terms of graphical presentations, companies appear to engage in impression management strategies relative to their use. We find that our sample of companies is far more likely to graph items showing favorable rather than unfavorable trends, and where material distortion in the graphs exists, considerably more often than not, the bias in design presents an image favorable to the firm.

Our investigation on whether impression management in the use of graphs in sustainability reports appears to be due to attempts at legitimization provides mixed results. On one side, graphs of social items for companies with worse social performance exhibit more apparent impression management than the graphs of better-performing firms, thus, supporting the legitimacy argument, although the explanatory power of our regression models is quite modest. On the other hand, however, we find no evidence of a relation between environmental performance and differences in impression management in the use of environmental graphs. One possible explanation for the lack of explanatory power regarding differences in the use of graphs as tools of impression management is that the choice to issue a stand-alone sustainability report is, in itself, an

[19] Similarly, examinations for differences in graph measures across companies following GRI guidelines versus those not citing GRI, as well as differences across firms with reports with outside attestation versus those without, indicated no statistically significant differences.

impression management strategy. Once that choice is made, firm-specific factors may play only a small role, if any, in the use of report-specific tools for influencing user impressions.[20]

Overall, the findings presented in this paper add support to those critics who lament that stand-alone sustainability reporting is not about providing meaningful accounting of corporate impacts across the sustainability domain, but more on projecting an image of positive performance. The voluntary, non-regulated nature of the practice leaves it open for potential abuse, and to the extent that biased reporting reduces transparency, it may very well lead to lower levels of corporate accountability (see, e.g., Hopwood 2009). Unfortunately, it appears that many users of the stand-alone reports fail to realize the inherent biases in the reporting, and continue to laud the practice as evidence of increased corporate transparency and accountability. As such, studies such as ours are important for shedding light on what corporate sustainability reports are and are not.

Like all studies, ours is not without limitations. Our measure of social and environmental performance, KLD scores, captures performance at a very broad level. More refined performance metrics could potentially reveal associations such a broad measure cannot uncover. Further, whether the findings we report hold across other time periods and other samples are untested. And while we show evidence of favorable bias in graph usage for our sample companies, we do not examine whether it actually influences user perceptions of performance across any of the triple bottom line areas. Extensions of research to address these shortcomings would appear to be warranted.

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[20] Another possible explanation for the lack of a relation between environmental performance and differences in impression management of graphs is that due to relatively high levels of societal concern with environmental issues such as global warming and greenhouse gas emissions, all companies, even better performers, feel pressure to present a favorable spin on the information they are highlighting through the use of graphs. Somewhat similarly, all companies are likely aware that there is more publicly available data on environmental performance issues (for example, the Toxics Release Inventory and other Environmental Protection Agency databases) and, therefore, choose, regardless of performance level, to use graphs to focus on favorable performance items.

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