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The Effect of Board Independence on the Sustainability Reporting Practices of Large U.S. Firms

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Abstract

As sustainability reporting becomes more commonplace, it is important to understand the factors that influence firms' voluntary reporting decisions. This exploratory study examines whether board independence affects the sustainability reporting decisions of the 500 largest firms in the United States. We also investigate other factors that may be associated with sustainability reporting, including environmental performance and reputation. We find that firms with a greater proportion of independent board members are: 1) more likely to publish standalone sustainability reports, and 2) more likely to publish higher quality sustainability reports. This paper contributes to prior literature that reports somewhat mixed results on the effect of board independence on voluntary disclosure.

Keywords: Sustainability Reporting, Corporate Governance, Voluntary Disclosure, Board Independence, Environmental Performance.

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Introduction

Sustainability reporting has been increasing globally as a voluntary reporting mechanism. Among G250¹ companies, 95% produce standalone sustainability reports (KPMG, 2011). This study examines factors associated with the voluntary issuance of standalone sustainability reports for the 500 largest firms in the United States. These reports provide environmental, social, and governance information such as greenhouse gas emissions, fresh water consumption, fines paid for pollution, employee safety incidents, and board composition. Recent research suggests that environmental and other socially responsible information is value relevant to investors (Margolis & Walsh, 2001; Orlitzky, Schmidt, & Rynes, 2003; Al-Tuwaijri, Christensen, & Hughes, 2004; Plumlee, Brown, & Marshall, 2008) and can lower the cost of equity capital (Richardson & Welker, 2001; Dhaliwhal, Li, Tsang, & Yang, 2011). These studies underscore the importance of sustainability disclosures in reducing information asymmetries and uncertainties between a firm and its shareholders. Accordingly, there is increased demand for sustainability reporting.

Prior research indicates that industry membership and regulation, country-specific legal environments and litigation concerns, environmental performance, size, and financial performance are significant factors related to the decision to voluntarily disclose information (Barth, McNichols, & Wilson, 1997; Li & McConomy, 1999; Patten, 2002; Clarkson, Li, Richardson, & Vasvari, 2008; Simnett, Vanstraelan, & Chua, 2009). We add to this stream of literature and find that a corporate governance measure, board independence, also explains the decision to voluntarily disclose sustainability reports. We also extend the recent finding of Cho, Guidry, Hageman, and Patten (2012) (hereafter Cho et al., 2012a) by documenting a negative association between environmental performance and sustainability disclosure across a broad sample of U.S. firms that represents most of the U.S capital market. Finally, we find that the likelihood of issuing a higher quality sustainability report is greater for firms with more independent boards and for firms with worse environmental performance.

Our findings may be informative to regulators given the increased demand for regulation of environmental and sustainability disclosures both internationally and in the U.S. For example, the Global Reporting Initiative (GRI), a network-based organization that produces a comprehensive sustainability reporting framework that is widely used around the world, strives to make sustainability reporting as routine as financial reporting (GRI, 2010).² In addition, the U.S. Securities and Exchange Commission recently issued interpretive guidance on climate change disclosures provided by firms. Our findings suggest that in a disclosure environment with little or no regulation, firms' corporate governance characteristics and environmental performance can predict whether they issue higher quality standalone sustainability reports.

¹ These are the first 250 companies in the Global Fortune 500 which lists the 500 companies with the highest annual revenues worldwide.

² Commission Guidance Regarding Disclosure Related to Climate Change, Securities Act Release No. 9106, Exchange Act Release No. 61,469, Fed. Reg. 6290 (Feb. 8, 2010).

The remainder of this paper is organized as follows. The first section below provides a literature review and develops the hypotheses. The next section discusses our data and methodology. Empirical results are then reported, with a summary and conclusion provided in the final section

Literature Review and Hypotheses Development

Prior environmental accounting research (including work on sustainability reporting) can be broadly categorized into three groups: value relevance studies on environmental disclosures, the relationship between environmental performance and disclosure³, and factors related to the decision to voluntarily disclose environmental information. We focus our literature review primarily on this latter research stream as it most closely relates to our study (i.e., factors associated with the provision of standalone sustainability reports). In addition, we draw from prior literature on voluntary disclosure in settings other than environmental reporting.

The extant literature on the decision to disclose environmental or sustainability information primarily involves disclosures made using media other than standalone sustainability or environmental reports, typically annual reports. Evidence from this literature suggests that voluntary environmental disclosure increases with firm size (Cowan, Ferreri, & Parker, 1987; Patten, 2002), profitability (Alnajjar, 2000), membership in an environmentally sensitive industry (Cowan et al., 1987; Barth et al., 1997; Roberts, 1992; Patten, 2002), the extent a firm is widely-owned (Cormier & Magnan, 1999, 2003), exposure to environmental litigation and fines (Neu, Warsame, & Pedwell, 1998), and media exposure of environmental activities (Bewley & Li, 2000; Neu et al., 1998; Cormier & Magnan, 2003)⁴. Simnett et al. (2009) examine sustainability reporting practices among 38,880 firms in 31 countries. For their sample period 2002-2004, the authors find that sustainability reporting (dummy variable equal to 1 if firm issued sustainability report and 0 otherwise) is positively associated with firm size and leverage. They also find that companies in the mining, production, utilities, and finance industries are more likely to produce sustainability reports than companies in other industries, and that companies residing in stakeholder-oriented countries (i.e., code law as opposed to common law countries) and countries with stronger legal environments are more likely to produce sustainability reports. The legal system variable is based on the "rule of law" score measuring the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence (Kaufmann, Kraay, & Mastruzzi, 2007). Of their 8,049 observations relating to the U.S., only 339 (4.2%) produced a sustainability report.

Board independence

This paper is the first to examine the impact of corporate governance on the likelihood

³ See Ingram and Frazier (1980), Wiseman (1982), Freedman and Wasley (1990), Bewley and Li (2000), Hughes, Anderson, and Golden (2001), Al-Tuwaijri et al. (2004), and Clarkson et al. (2008).

⁴ See Berthelot, Magnan, and Cormier (2003) for a detailed literature review on environmental reporting.

181

of firms issuing sustainability reports. The corporate governance measure examined in this study is the proportion of *outside* directors to the total number of directors on the board. Independent directors have been viewed as referees who ensure that the board, as the ultimate internal monitor of managerial decision making, protects the interests of shareholders (Fama, 1980). Prior studies highlight the effectiveness of independent directors relative to corporate insiders in reducing agency problems (Berle & Means, 1932; Fama & Jensen, 1983; Jensen 1993). Fama and Jensen (1983) suggest that more independent boards can monitor more effectively, that is, they have greater control over managerial decisions. Independent directors who are less aligned to management may be more inclined to encourage firms to disclose more information to outside investors. The Williamson (1984) theoretical framework on corporate governance suggests that board monitoring effectiveness is related to its composition and may be evidenced in voluntary disclosure.

The empirical evidence regarding the impact of board composition on voluntary disclosure is somewhat mixed. Prior research documenting a negative relationship between the proportion of independent directors on the board and voluntary disclosure is found by both Eng and Mak (2003) and Gul and Leung (2004) for their sample of firms in Singapore and Hong Kong, respectively⁵. Both studies suggest that external directors in Singapore and Hong Kong play a substitute-monitoring role to disclosure. Conversely, several studies find a positive relationship between the proportion of independent directors on the board and voluntary disclosure measures compiled from: 1) less regulated international reporting environments where board mechanisms are likely to play a role in reducing information asymmetries (Cheng & Courtenay, 2006; Chen & Jaggi, 2000); 2) management earnings forecasts (Ajinkya, Bhojraj, & Sengupta, 2005; Karamanou & Vafeas, 2005); and 3) compensation disclosures (Laksmana, 2008).

Sustainability reporting is also known as environmental, social, and governance (ESG) reporting. The relation between corporate governance and disclosure within the context of this reporting channel is interesting because information on corporate governance is often included in the information being voluntarily disclosed. For example, firms may include information in their sustainability reports on their governance structure, board composition, processes for determining qualifications and expertise of board members, and evaluations of the board's own performance. Carcello⁶, Hermanson, and Neal (2002) find that voluntary disclosure of audit committee activities was more common for companies with more independent audit committees. This may suggest that more independent boards will be more likely to voluntarily disclose information about themselves.

Recent research by Duchin, Matsusaka, and Ozbas (2010) indicates that the effectiveness of independent board directors (which may impact disclosure under the Williamson [1984] framework) depends upon the cost of outsiders gathering the

⁵ Cheng and Courtenay (2006) argue that these findings may be due to the sample years predating the Asian financial crisis.

⁶ GRI profile disclosures 4.1, 4.3, 4.7, and 4.10, respectively.

information. The study contends and finds that board independence is effective (harmful) when the cost to outside investors gathering this information is low (high) suggesting that a rich information environment indicates low information gathering costs. In addition, they find that firms appear to recognize this fact in setting their board structure. Our study examines the relationship between voluntary disclosure of standalone sustainability reports and corporate governance for the 500 largest U.S. firms. Among these firms, voluntary assurance of sustainability reports is minimal.⁷ The setting is therefore one in which the firms' general information environment is rich (low costs to gather information) and the intermediary vessels available to reduce information asymmetries are fewer. As such, our setting is more likely to highlight the monitoring benefits of increased levels of board independence. Given the mixed results from prior research on the relationship between board composition and voluntary disclosure, our set of competing hypotheses is as follows:

- H_{1a} : Firms with more independent boards will have a higher likelihood of issuing a sustainability report.
- H_{1b} : Firms with more independent boards will have a lower likelihood of issuing a sustainability report.

Environmental performance and reputation

We also examine the effects of environmental performance and perceptions of corporate environmental reputation on sustainability reporting. Prior research examining the association between environmental performance and environmental disclosure has yielded mixed results. Existing studies have found no significant association between performance and disclosure (Ingram & Frazier, 1980; Wiseman, 1982), a negative association (Bewley & Li, 2000; Hughes et al., 2001; Cho et al., 2012a; Cho, Freedman, & Patten, 2012 [hereafter Cho et al., 2012b]), or a positive association (Al-Tuwaijri et al., 2004; Clarkson et al., 2008).

Recent research suggests that legitimacy theory is useful in explaining environmental disclosure decisions. According to legitimacy theory, voluntary sustainability reporting may not correspond with actual performance (Mahoney, 2012), and corporations may be using sustainability reports as a way to enhance their image and reduce exposures to social and political pressures.⁹ Consistent with this view, Cho et al. (2012a) and Cho et al. (2012b) find a negative association between disclosure quality and environmental performance and Cho et al. (2012a) find a positive association between perceived corporate environmental reputation and disclosure. In light of these findings, we expect that 1) firms with worse environmental performance will have a higher likelihood of issuing a sustainability report, and 2) firms with a better reputation will have a higher

⁷ Only 12 reports (5%) in our sample were independently assured.

⁸ Patten (2002) attributed the mixed results to lack of additional control factors, inadequate sample selection, and poor measures of environmental performance.

⁹ Indeed, recent research finds that corporate social responsibility behaviors were influenced by sociopolitical pressures experienced by companies in the post-Sarbanes-Oxley period (Roush, Mahoney, & Thorne, 2012).

likelihood of issuing a sustainability report.

Method

Data and measures

The sample used in this study consists of the 500 largest firms in the U.S. as compiled by Newsweek in their Green Rankings 2009 (Newsweek, 2010). The 500 companies represent the largest U.S. companies as measured by revenue, market capitalization, and number of employees. These firms have a considerable impact on the U.S. economy, representing approximately 75% of total U.S. market capitalization.

For the 500 sample firms, we hand-collected sustainability reporting information from CorporateRegister.com, the world's largest online directory of sustainability reports. Our main dependent variable, the provision of a sustainability report, was coded to 1 if the firm published at least one sustainability report from January 1, 2006 through the date of hand collection (March 16, 2010), and 0 otherwise. It was necessary to include reports published prior to 2009 in measuring our dependent variable as sustainability reporting cycles (e.g., annual, biennial, triennial) vary among firms.¹⁰ We use standalone sustainability reports as a dependent variable as this reporting channel represented the leading reporting practice during our sample period and continues to increase in popularity along with other media formats (KPMG, 2011). This approach is also consistent with prior research (Simnett et al., 2009).

Our predictor of interest is board independence. The proportion of independent directors on the board was principally calculated using 2008 data from the Risk Metrics database. Board member information from this database was available for 450 of the 500 firms in the sample. Board composition information for the remaining firms was hand-collected from regulatory proxy filings, with director independence status determined by the appropriate exchange definitions (NYSE or NASDAQ).

Following Cho et al. (2012a), environmental performance, measured using the environmental impact score calculated based on data compiled by Trucost and obtained from the Newsweek Green Rankings 2009 report, is included as a control variable.¹¹ Also consistent with Cho et al. (2012a), environmental reputation, based on opinion surveys of corporate social responsibility professionals, academics, and other environmental experts as reported in Newsweek, is included as a control variable.

Informed by prior literature, we include control variables for environmentally sensitive industries, litigious industries, reputation effects, and other general industry effects. Simnett et al. (2009) found a positive association between standalone sustainability reporting and firms operating in the mining, production, utilities, and

¹⁰ No sample firm's cycle is less frequent than every three years making the 2006 cutoff appropriate. Reports in sample by year are 2, 7, 43, 182, and 8 for 2006, 2007, 2008, 2009, and 2010, respectively. A report must have included environmental information to be considered a sustainability report. We excluded reports that dealt exclusively with charitable or philanthropic information. If a firm issued more than one sustainability report since 2006, descriptive information on reports discussed subsequently pertains to the firm's most recent report.

¹¹ Further information on Green Score methodology is available at http://greenrankings.newsweek.com/.

finance industries. Day and Woodward (2009) describe the level of social and environmental disclosure across the finance sector as disappointingly low. Other prior research has documented a positive association between firms in environmentally sensitive industries and environmental disclosure through other forms of media, typically annual reports (Roberts, 1992; Cowan et al., 1987; Barth et al., 1997; Patten, 2002). High litigation industries have also been shown to be related to increased voluntary disclosure (Ajinkya et al, 2005; Miller & Piotroski, 2000; Francis, Philbrick, & Schipper, 1994). As such, we expect a positive relationship between firms in environmentally sensitive and litigious industries and standalone sustainability reporting. Industry dummy variables were created based upon two-digit Standard Industrial Classification (SIC) codes obtained from Compustat.

In addition, we control for other firm-specific characteristics shown to be related to voluntary disclosure in prior research. Based on our review of the relevant literatures on sustainability reporting and other forms of discretionary disclosure, we control for firm size (Simnett et al., 2009; Gul & Leung, 2004; Cowan et al., 1987; Patten, 2002), leverage (Simnett et al., 2009; Eng & Mak, 2003), profitability (Gul & Leung, 2004; Alnajjar, 2000), market-to-book ratio (Ajinkya et al., 2005), growth (Cheng & Courtenay, 2006), liquidity (Wynn, 2008; Ajinkya et al., 2005) and the richness of the information environment (Duchin et al., 2010). Financial statement information for 2008 is obtained from Compustat. The richness of the information environment is calculated based upon the number of analysts following the firm in 2008-2009 and the analyst forecast dispersion (Duchin et al., 2010) during this time as reported in the IBES database.¹² In addition, volume and return information is obtained from the CRSP database. We also include institutional ownership percentages as of December 31, 2009 obtained from Thomson Reuters as a control variable.¹³

Model

We employ binary logistic regression to examine the likelihood of voluntarily disclosing a standalone sustainability report. The model is estimated as follows:

¹² Analyst forecast dispersion is an alternative measure to the number of analyst forecasts which both proxy for information costs. The variable is insignificant in the regressions so we report only results using number of analysts.

¹³ The literature on voluntary disclosure and institutional ownership is mixed. Healy, Hutton, and Palepu (1999) and Bushee and Noe (2000) suggest that institutions prefer firms with increased levels of annual report disclosure (indicating a positive relation between voluntary disclosure and institutional ownership percentage). In line with this, Ajinkya et al. (2005) find that the voluntary issuance of earnings-related management forecasts is increasing with the level of institutional ownership. In contrast, research examining the relationship between environmental disclosure and the level of dispersion of shares amongst investors indicates that disclosure increases (decreases) with the extent that a firm is widely-(closely-) owned (Cormier & Magnan, 1999, 2003; Chau & Gray, 2002). This research would suggest a negative relationship between institutional ownership and the decision to issue a standalone sustainability report. Given these mixed results, we do not predict a direction for institutional ownership.

Prob(REPORT=1) = $\beta_0 + \beta_1$ PIND + β_2 INSTPER + β_3 ENVPER + β_4 REPTN + β_5 SIZE + β_6 ROA + β_7 LEVERAGE + β_8 NUMANLYST + β_9 MKT/BK + β_{10} LIQUID + β_{11} GROWTH + β_{12} UTIL + β_{13} ENMINE + β_{14} CHEM + β_{15} FINANCE + β_{16} LIT + $\sum_{i=1}^{k} \beta_{17+k}$ IND_k + ε

where: REPORT = dummy variable equal to 1 if the firm issued a sustainability report and 0 otherwise; PIND = proportion of board directors who are independent; INSTPER = institutional ownership percentage; ENVPER = environmental performance score obtained from Newsweek; REPTN = environmental reputation score obtained from Newsweek; SIZE = natural logarithm of annual sales; ROA = return-on-assets ratio; LEVERAGE = debt-to-equity ratio; NUMANLYST = the average number of analysts providing a quarterly earnings forecast for the firm during 2009; MKT/BK = the market value of equity divided by book value of equity; LIQUID = the log of average trading volume in 2009 divided by average shares outstanding; GROWTH = the percentage change in sales during the year; UTIL = dummy variable equal to 1 if firm is in utilities industry (two-digit SIC code 49) and 0 otherwise; ENMINE = dummy variable equal to 1 if firm is in the energy or mining industries (two-digit SIC codes 10, 12, 13, 14, and 29) and 0 otherwise; CHEM = dummy variable equal to 1 if firm is in chemicals industry (two-digit SIC code 28) and 0 otherwise; FINANCE = dummy variable equal to 1 if firm is in the financial services industries (two-digit SIC codes 60-65 and 67), and 0 otherwise; LIT = dummyvariable equal to 1 if the firm is in the biotechnology (SIC codes 2833-2836 and 8731 -8734), computers (3570-3577 and 7370-7374), electronics (3600-3674), and retail (5200-5961) industries, and 0 otherwise (based on Francis et al., 1994 and Miller & Pitroski, 2000). As an additional industry control, IND_k represents the kth industry dummy variable for all k additional industries with greater than 10 observations per two-digit SIC code.¹⁴ Continuous variables are winsorized at the 1st and 99th percentiles.

Result and Discussion

Report Issuance

Table 1 presents the descriptive statistics. Of the 500 firms, 242 (48%) voluntarily published a standalone sustainability report. The average proportion of independent directors and average institutional ownership percentage is 80% and 77%, respectively. The average environmental performance and reputation scores are 50.13 and 34.38 out of 100, respectively, where higher scores denote better performance/ reputation. Of the 500 sample firms, 43 (9%) operate in the utilities sector, 30 (6%) in the energy or mining sector, and 39 (8%) in the chemicals sector.¹⁵

¹⁴ Insignificant industry coefficient estimates are not provided in the regression tables for reporting purposes.

 $^{^{15}}$ The paper and pulp sector is classified as environmentally sensitive in some prior literature. Only seven (1.4%) firms in our sample are members of this industry and an indicator variable for this sector in our models is not significant and is excluded from the analyses.

Variable	N	Mean	Median	Minimum	Maximum
REPORT	500	0.48	0.00	0.00	1.00
PIND	500	0.80	0.82	0.31	0.93
INSTPER	500	0.77	0.81	0.00	1.03
ENVPER	500	50.13	50.70	1.3	99.2
REPTN	500	34.38	32.97	4.52	85.15
SIZE	500	13.24	13.06	10.48	17.31
ROA	500	0.05	0.05	-0.37	0.27
LEVERAGE	500	0.65	0.54	-20.11	13.82
NUMANLYST	500	10.25	9.96	2.00	23.37
MKT/BK	500	2.24	1.87	-23.02	15.18
LIQUID	500	2.55	2.51	1.19	3.86
GROWTH	500	0.09	0.08	-0.40	0.86
UTIL	500	0.09	0.00	0.00	1.00
ENMINE	500	0.06	0.00	0.00	1.00
CHEM	500	0.08	0.00	0.00	1.00
FINANCE	500	0.13	0.00	0.00	1.00
LIT	500	0.19	0.00	0.00	1.00

Table 1. Descriptive Statistics

REPORT = dummy variable equal to one if firm produced a sustainability report and zero otherwise; PIND = proportion of firm's directors who are independent of firm; INSTPER = firm's institutional ownership percentage; ENVPER = environmental performance measure obtained from Newsweek; REPTN = reputation scores obtained from Newsweek; SIZE = firm size measured as the natural logarithm of annual sales; ROA = firm's return-on-assets ratio; LEVERAGE = firm's debt-to-equity ratio; NUMANLYST = the average number of analysts providing a quarterly earnings forecast for the firm; MKT/BK = the market value of equity divided by book value of equity; LIQUID = the log of average trading volume divided by average shares outstanding; GROWTH = the percentage change in sales during the year; UTIL = dummy variable equal to one if firm is in utilities industry (two-digit SIC code 49) and zero otherwise; ENMINE = dummy variable equal to one if firm is in the energy or mining industries (two-digit SIC codes 10, 12, 13, 14, and 29) and zero otherwise; FINANCE = dummy variable equal to one if firm is in the financial services industries (two-digit SIC codes 60-65 and 67), and zero otherwise; LIT = dummy variable equal to one if firm is in the financial services industries (two-digit SIC codes 60-65 and 67), and zero otherwise; CJET = dummy variable equal to one if firm is in the financial services industries (two-digit SIC codes 60-65 and 67), and zero otherwise; CJET = dummy variable equal to one if firm is in the financial services industries (3600–3674), and retail (5200–5961) industries, and zero otherwise.

Table 2 details the percentage of sustainability reporters within each industry. In line with prior research, these environmentally sensitive industries appear to have large percentages of firms that produce sustainability reports (60% in energy or mining industries, 77% in chemicals, and 74% in utilities). Consistent with arguments made by Day and Woodward (2009), the finance industry appears to provide sustainability reports for a relatively small percentage of firms (31%).

	i i	v	
	N C	No. of	
T. J. dura	No. of	Reporter	0/ D
	Firms	<u>s</u>	% Reporters
Air transportation	3	3	100%
Amusement and recreation services	4	0	0%
Apparel and other textile products	3	0	0%
Auto repair, services, and parking	l	0	0%
Business services	32	11	34%
Chemicals	39	30	77%
Communication	21	7	33%
Educational services	1	0	0%
Energy, Mining	30	18	60%
Engineering and management services	5	3	60%
Fabricated metal products	6	1	17%
Finance	72	22	31%
Food and kindred products	24	20	83%
Furniture and fixtures	2	1	50%
General building contractors	2	1	50%
Health services	6	1	17%
Heavy construction, except building	3	2	67%
Hotels and other lodging places	2	1	50%
Instruments and related products	22	7	32%
Leather and leather products	1	0	0%
Lumber and wood products	2	2	100%
Misc. manufacturing industries	3	1	33%
Non-classifiable establishments	1	1	100%
Paper and allied products	7	5	71%
Personal services	2	0	0%
Primary metal industries	7	2	29%
Printing and publishing	2	0	0%
Railroad transportation	4	2	50%
Rubber and mise, plastics products	4	2	50%
Special trade contractors	1	0	0%
Stone, clay, and glass products	2	1	50%
Textile mill products	- 1	0	0%
Tobacco products	4	1	25%
Transportation equipment	16	10	63%
Transportation services	3	1	33%
Trucking and warehousing	3	1	33%
Itilities	43	32	74%
Water transportation	1	1	100%
Wholesale trade - durable goods	7	0	0%
Wholesale trade - nondurable goods	, Δ	2	50%
Litigious industries	104	50	48%
Total	500	242	100/
Total	300	Z4Z	4070

Table 2. Sustainability Reporters by Industry

sustamaonity	reports			io not, s	ucii as i											
					Table	3.Spear	man Co	orrelati	on Stat	istics						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. REPORT																
2. PIND	0.26^{**}															
3. INSTPER	-0.26**	0.01														
4. ENVPER	-0.27**	-0.12**	0.13**													
5. SIZE	0.42**	0.30**	-0.22**	-0.03												
6. ROA	-0.03	-0.04	0.02	-0.09	-0.08											
7. LEVERAGE	0.16^{**}	0.13**	-0.12*	-0.21**	0.11*	-0.40**										
8. NUMANLYST	-0.12*	-0.06	0.12*	0.40^{**}	0.15**	0.18**	-0.34**									
9. MKT/BK	0.05	-0.02	0.01	-0.05	-0.11*	0.55**	-0.04	0.16^{**}								
10. LIQUID	-0.23**	-0.14**	0.35**	0.24**	-0.16**	-0.21**	0.00	0.30**	-0.19**							
11. GROWTH	-0.02	-0.07	0.02	-0.21**	-0.05	0.26**	-0.16**	0.10^{*}	0.18**	-0.04						
12. UTIL	0.16^{**}	0.14**	-0.21**	-0.39**	0.01	-0.16**	0.29**	-0.40**	-0.15**	-0.28**	0.07					
13. ENMINE	0.06	0.00	0.03	-0.21**	0.09	0.08	-0.09	0.14**	-0.08	0.08	0.26**	-0.08				
14. CHEM	0.17**	0.10^{*}	-0.02	-0.16**	0.00	0.15**	-0.02	-0.02	0.20**	-0.15**	0.10^{*}	-0.09	-0.07			
15. FINANCE	-0.13**	0.05	-0.10*	0.55**	0.06	-0.30**	0.05	0.15**	-0.28**	0.17**	-0.32**	-0.12*	-0.10*	-0.11*		
16. LIT	0.01	-0.02	0.08	0.18**	-0.11*	0.18**	-0.27**	0.24**	0.11^{*}	0.08	0.10^{*}	-0.15**	-0.12*	-0.14**	-0.18**	
17. REPTN	0.33**	0.12**	-0.10*	-0.09*	0.36**	-0.06	0.08	0.04	-0.02	-0.13**	-0.03	0.09*	0.03*	0.04	-0.02	0.07
**,* indicates p-valu	ues of <.01, :	and <.05, re	spectively.	All variable	es are define	ed in Table	1.									

Table 3 presents the Spearman correlation coefficients. All p-values reported in this study are two-tailed. PIND is positively correlated with REPORT (p < .01), whereas INSTPER and ENVPER are negatively correlated with REPORT (p < .01). Consistent with Cho et al. (2012a), REPTN is positively correlated with REPORT (p < .01) and ENVPER and REPTN are negatively correlated with each other (p < .05). However, these univariate results do not control for other differences between firms that publish sustainability reports and those that do not such as firm size

189

Table 4 reports the logistic regression results examining the likelihood of firms voluntarily issuing a sustainability report. PIND is positively associated with REPORT (p < .05), indicating that firms with a higher proportion of independent directors on the board are more likely to publish standalone sustainability reports. This supports hypothesis H_{Ia} (firms with more independent boards will have a higher likelihood of issuing a sustainability report) and is consistent with the literature suggesting that the monitoring function of independent directors improves the transparency of the firm through increased voluntary disclosures. This result is inconsistent with HI_b (firms with more independent boards will have a lower likelihood of issuing a sustainability report). INSTPER is negatively associated with REPORT but the coefficient is not significant. ENVPER is negatively related to REPORT (p < .05) indicating that firms with worse environmental performance have a higher likelihood of issuing a sustainability report, which is consistent with recent research supporting the legitimacy-based theory of disclosure (e.g., Cho et al., 2012a).

Variable	Coefficient Estimate	Standard Error	Wald Chi- Square	Odds Ratio
Intercept	-11 52	1.83	39 67***	0 440 14410
PIND	2.92	1.05	6 13**	18 61
INSTPER	-1.01	0.79	1.60	0.36
ENVPER	-0.01	0.006	5.89**	0.98
REPTN	0.06	0.01	23.14***	1.06
SIZE	0.66	0.10	40.82***	1.93
ROA	-2.09	1.38	2.27	0.12
LEVERAGE	-0.09	0.05	3.09*	0.91
NUMANLYST	-0.06	0.03	3.67***	0.94
MKT/BK	0.07	0.04	3.51*	1.07
LIQUID	0.02	0.26	0.01	1.02
GROWTH	-1.32	0.75	3.10*	0.26
UTIL	0.84	0.51	2.69*	2.32
ENMINE	1.01	0.54	3.42*	2.76
CHEM	2.11	0.55	14.65***	8.29
FINANCE	-0.01	0.47	0.01	0.98
LIT	1.13	0.34	10.91***	3.11
FOOD	1.97	0.69	8.02***	7.22
Frequency:				
REPORT = 1	242			
REPORT = 0	258			
Fit	86.2%			
Wald score	122.51***			

 Table 4. Binary Logistic Regression

 Dependent Variable: REPORT

FOOD = dummy variable equal to one if firm is in the food and kindred products industry (two-digit SIC code 20), and zero otherwise. All other variables are defined in Table 1. ***,**,* indicates p-values of <.01, <.05, and <.10, respectively. We also find that firms operating in environmentally sensitive and litigious industries are more likely to issue a sustainability report as UTIL, ENMINE, CHEM, and LIT are all positively significant. Of the additional industry control variables, only firms operating in the food and kindred products industry (FOOD) are significantly more likely to disclose sustainability reports. SIZE is positively associated with REPORT indicating that larger firms are more likely to provide reports. Finally, the significant negative coefficient of NUMANLYST indicates that as the number of analysts following the firm increases, firms are less likely to provide a sustainability report. If this measure correctly proxies for information costs to outsiders, this suggests that voluntary disclosure is less likely for firms that have richer information environments and therefore lower information gathering costs to outside investors.

Report quality

One of the major limitations of studies on voluntary disclosure is the difficulty in measuring the extent of voluntary disclosure (Healy & Palepu, 2001). Sentence, word, and page count have been used to determine the extent of voluntary social disclosure (e.g., van der Laan Smith, Adhikari, & Tondkar, 2005). Other studies on voluntary disclosure employ self-developed scoring processes where reported information (e.g., an annual report) is analyzed and researchers calculate a disclosure score to serve as their dependent variable (e.g., Gul & Leung, 2004). To the extent that construction of the scoring metrics involves judgment on the part of the researcher, the findings may be difficult to replicate (Healy & Palepu, 2001).

An advantage of using a dichotomous dependent variable such as REPORT is the elimination of the need for scoring. The outcome variable is very objective – the firm either issued a voluntary sustainability report or they did not. A disadvantage is that this method may fail to address significant discrepancies in report extent and quality. To address this concern, we perform an additional analysis that incorporates a categorical measure of report quality. Our identifier of quality levels is based on established sustainability reporting guidelines – GRI generation three (G3) guidelines. The GRI is a network-based organization that has pioneered the development of the world's most widely-used sustainability reporting framework (GRI, 2010). GRI guidelines represent the most dominant sustainability reporting regulations (Ballou, Heitger, & Landes, 2006) and have become the de facto international reporting standard (MacLean & Rebernak, 2007). Approximately 80% of the G250 use GRI guidelines for their reporting (KPMG, 2011).

Launched in 2006, G3 has established application levels which reporting organizations are required to declare to indicate the degree to which they have applied the G3 guidelines. The reporting criteria at each G3 application level (A, B, C) reflect a measure of the extent of application or coverage of the GRI reporting framework. The extent of required disclosure and performance indicators increases from level C to B, and B to A. The declaration of a reporting level discourages companies from paying mere lip service to the standard by claiming that their reports are "based on" or "informed by" the GRI guidelines and the G3 guidelines urge more transparency, prioritization of issues, and stakeholder input (MacLean & Rebernak, 2007). Of the

242 reports in our sample, 38 (16%) declared a level B or higher, 68 (28%) declared an entry level C or included some GRI information in the content index but did not declare an application level, and 136 (56%) did not reference or apply any reporting guidelines. ¹⁶We use a categorical report quality criterion variable (REPQ) with four categories: 1) very high quality reporting where G3 levels are either A or B; 2) entry-level C reporting or firms referencing some GRI information; 3) firms not referencing any guidelines in their reports; and 4) non-reporting firms.

Table 5 presents the results for the ordered logistic regression of REPQ on our variables of interest and control variables. The outcome variable, REPQ, is increasing in sustainability report quality according to the GRI guidelines. The results are conceptually similar to the results from the main analysis. PIND remains significantly positive (p < .05) suggesting that firms with more independent boards are more likely to issue higher quality reports. ENVPER remains significantly negative (p < .05) indicating that firms with worse environmental performance are more likely to issue higher quality reports. Again, this result is consistent with socio-political

Variable	Coefficient Estimate	Standard Error	Wald Chi-Square	Odds Ratio
Intercept 2	-13.17	1.49	77.77***	
Intercept 1	-11.55	1.46	62.55***	
Intercept 0	-9.59	1.42	45.17***	
PIND	2.29	0.98	5.48**	9.97
INSTPER	-0.64	0.59	1.15	0.52
ENVPER	-0.01	0.019	5.56**	0.98
REPTN	0.05	0.01	47.38***	1.06
SIZE	0.50	0.07	42.30***	1.66
ROA	-1.37	1.18	1.35	0.25
LEVERAGE	-0.08	0.04	3.69*	0.91
NUMANLYST	-0.05	0.02	4.52**	0.94
BK/MKT	0.07	0.03	4.42**	1.07
LIQUID	0.08	0.21	0.14	1.08
GROWTH	-1.76	0.65	7.30***	0.17
UTIL	1.15	0.40	8.03***	3.18
ENMINE	1.25	0.43	8.29***	3.52
CHEM	1.95	0.38	26.12***	7.07
FINANCE	-0.01	0.42	0.96	0.98
LIT	1.04	0.29	12.66***	2.83
FOOD	1.88	0.48	15.04***	6.60
Frequency:				
REPQ = 2	38			
REPQ = 1	68			
REPQ = 0	136			
REPQ = -1	258			
Fit	82.6%			
Wald-score	190.81***			

Table 5.Ordered Logistic Regression Dependent Variable: REPQ

REPQ = categorical variable equal to 2 if GRI G3 reporting level is either A or B; 1 if G3 level is C or firm references some GRI information in report; 0 if firm does not reference any guidelines in their report; and -1 for non-reporting firms. All other variables are defined in Table 1. ***,**,* indicates p-values of <.01, <.05, and <.10, respectively.

¹⁶ Of the 60 reports in our sample that declared a G3 application level, 9 are level A, 29 are B, and 22 are C

legitimacy theory of disclosure. The industry effects are also conceptually consistent with the results from the main analysis.

Summary and Conclusion

In this exploratory study, we examined the relationship between the voluntary disclosure of standalone sustainability reports and board independence for the 500 largest firms in the U.S. We add to the stream of literature on voluntary environmental and sustainability disclosure with our finding that board independence also explains firms' sustainability reporting decisions. We also find that the likelihood of issuing a higher quality sustainability report is greater for firms with more independent boards. These findings are consistent with the Williamson (1984) theoretical framework on corporate governance which suggests that board monitoring effectiveness is related to its composition and may be evidenced in voluntary disclosure. In addition, we extend the recent findings of Cho et al. (2012a) by documenting 1) a negative association between environmental reputation and sustainability disclosure across a broad sample of U.S. firms that represents most of the U.S capital market.

Our study represents an important contribution to the sustainability and disclosure literatures. The relationship between corporate governance and voluntary sustainability reporting had not been previously examined. Our setting involves firms that are ardently followed by large numbers of investors, institutions, and analysts. In addition, sustainability reports are increasingly demanded by investors in the U.S. and provide value relevant information. Consequently, providing evidence on the relationships between sustainability reporting and board composition is likely to be very relevant for a broad set of capital market participants. Our findings may also be informative to regulators given the increased demand for regulation of environmental and sustainability disclosures both internationally and in the U.S. Our findings suggest that in a disclosure environment with little or no regulation, firms' corporate governance and environmental performance/reputation characteristics can predict whether they issue higher quality standalone sustainability reports.

This study has limitations. Concern may exist as to whether the production of a standalone sustainability report truly reflects a firm's viewpoint on voluntary disclosure in this area. Firms may be providing the same information on their corporate websites as opposed to issuing standalone reports. Another limitation is the use of GRI reporting levels as a proxy for reporting quality. GRI reporting levels are self-declared and therefore may not truly reflect the extent and quality of the report. ¹⁷Further, the Newsweek environmental performance and reputation scores, like all proxies, may not perfectly reflect the true underlying attributes they attempt to capture (cf. Cho et al.,

¹⁷ This limitation should especially be considered in light of the very low percentage (5%) of reports in our sample that were externally assured. Even if sustainability reports are assured, questions persist regarding the scope, legitimacy, and consistency of the actual assurance procedures performed on such reports (O'Dwyer, Owen, & Unerman, 2011).

¹⁸ Business-based attempts to develop social and environmental metrics have been going on for decades (Gray, 2010).

2012). ¹⁸ In addition, slight timing differences exist in our proxy data. Financial and director information relates to 2008 whereas environmental performance and institutional ownership information relate to 2009. As we are dealing with large mature firms, however, it is not likely that board composition policies and firm attributes such as size would vary enough over our narrow study period to significantly affect the results. Despite these limitations, the findings provide useful insight on firms' voluntary sustainability reporting decisions.

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