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Scrutiny, Norms, and Selective Disclosure: A Global Study of Greenwashing

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Under increased pressure to report environmental impacts, some firms selectively disclose relatively benign impacts, creating an impression of transparency while masking their true performance. We theorize circumstances under which firms are less likely to engage in such *selective disclosure*, focusing on organizational and institutional factors that intensify scrutiny and expectations of transparency and that foster civil society mobilization. We test our hypotheses using a novel panel data set of 4,750 public companies across many industries that are headquartered in 45 countries during 2004–2007. Results show that firms that are more environmentally damaging, particularly those in countries where they are more exposed to scrutiny and global norms, are less likely to engage in selective disclosure. We discuss contributions to research on institutional theory, strategic management, and information disclosure.

Keywords: institutional theory; social movements; sustainability; corporate social responsibility; symbolic management; information disclosure; sustainability reporting; greenwashing; civil society; globalization
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Introduction

Organizations often respond to new institutional demands by exhibiting symbolic compliance, where they merely appear to comply (Meyer and Rowan 1977, Zajac and Westphal 2004, Bromley and Powell 2012). For example, companies have created their own corporate governance standards to appear rigorous while avoiding complying with more stringent standards (Okhmatovskiy and David 2012), developed voluntary self-regulation programs to forestall the implementation of mandatory ones (Lenox 2006, Glachant 2007, Delmas and Montes-Sancho 2010), and bolstered their social image to shift stakeholder attention away from areas of criticism (McDonnell and King 2013). Yet despite much evidence that organizations often symbolically respond to stakeholder demands, much less is known about "how, when, and why" they pursue this strategy (Scott 2001; Bromley and Powell 2012, p. 485).

In this paper we examine *selective disclosure*, which we define as a symbolic strategy whereby firms seek to gain or maintain legitimacy by disproportionately revealing beneficial or relatively benign performance indicators to obscure their less impressive overall performance. Prior research on similar processes has mainly examined how firms selectively disclose private information to a select group of people or investors, without simultaneously disclosing the same information to the public (e.g., Heflin et al. 2003, Kirk and Vincent 2014). We conceptualize selective disclosure, by contrast, as a symbolic strategy whereby firms reveal a subset of private information to create a misleadingly positive public impression. Furthermore, this literature has mainly examined these processes in the United States, whereas we examine selective disclosure in a multinational context. This cross-country variation allows us to better specify and understand the mechanisms of scrutiny and norm diffusion that limit firms' symbolic activity. This is important because, as Scott (2001) notes, although there are many studies revealing the presence of symbolic action, few have explored the conditions under which organizations engage in such activities.

We focus on one type of selective disclosure, a form of greenwashing whereby companies disclose positive environmental actions while concealing negative ones to create a misleadingly positive impression of overall environmental performance (Lyon and Maxwell 2011). Such firm-level greenwashing differs from product-level greenwashing, a common marketing strategy where firms exaggerate or obfuscate the environmental benefits of a specific product or service to increase sales (Delmas and Burbano 2011). Focusing on firm-level selective information disclosure thus aligns with our broader theoretical conceptualization of selective disclosure as a general corporate symbolic process that also applies to many other corporate activities such as financial reporting (Pfeffer 1981, Abrahamson and Park 1994). Moreover, understanding firm-level selective disclosure is increasingly important given rising demands for organizations to exhibit greater accountability and transparency (Power 1994, Bromley and Powell 2012).

We hypothesize and find evidence that several organizational attributes and institutional mechanisms dissuade companies from engaging in selective disclosure. Our model unpacks how particular organizational characteristics, such as environmental damage and foreign exposure, are likely to increase a company's exposure to scrutiny and to global norms of transparency and thus influence its responsiveness to civil society pressure. We also hypothesize that companies causing more environmental damage will be dissuaded from selective disclosure in institutional environments in which organized social movements and public voice are more feasible and that feature more normative pressure for disclosure resulting from greater diffusion of environmental information. We test and find empirical support for our hypotheses using company- and country-level data to analyze the environmental reporting practices of 4,750 large publicly traded companies headquartered in 45 countries during the years 2004–2007, a period when firms faced increasing pressure to report their environmental impacts (KPMG 2008).

Understanding how organizational factors and their interaction with institutional pressures can deter selective disclosure has important implications for several literatures. Our results enable researchers to build a more complete and generalizable theory of organizational symbolic processes, addressing Scott's (2001) call for a greater understanding of the determinants of organizational symbolism. Examining how selective disclosure plays out cross-nationally is particularly timely and important given Bromley and Powell's (2012) assertion that the recent transparency and accountability movements have led to organizational symbolism being more widely deployed today than at any time in the past. Going beyond the existing literature, our research identifies and tests key institutional processes across different types of political and economic systems. The institutional variation across these contexts enables us to better identify the scrutiny and normative mechanisms we theorize and to reveal how they actually shape organizational behavior.

Our research also contributes to the literature on information disclosure, which has mainly focused on identifying factors that encourage voluntary disclosure rather than on questioning how accurately the disclosed information conveys overall performance. Furthermore, our measure of selective disclosure—which compares firms' symbolic transparency with their substantive transparency to estimate the extent to which their disclosure pattern might mislead stakeholders—goes beyond the prior literature, which tends to examine either symbolic or substantive transparency (e.g., Kolk 2004, Marquis and Qian 2014, Short and Toffel 2008, Reid and Toffel 2009). In doing so, our work provides a novel approach to understanding this form of organizational symbolic activity. By empirically examining the representativeness of firms' environmental reporting, we also advance the nascent management literature on greenwashing (Delmas and Burbano 2011; Kim and Lyon 2011, 2015; Lyon and Maxwell 2011; Bowen 2014, Lyon and Montgomery 2015). Finally, given the growing managerial and governmental interest in understanding companies' environmental practices and performance, our findings have important implications for practice.

Selective Disclosure in Environmental Reporting

Companies have faced increasing pressure over the past decade to report more information about their environmental impacts. A growing number of stakeholders—including investors, consumers, governments, and corporate customers—are concerned that assessing organizational performance requires a more holistic picture than financial indicators can provide and have increasingly sought to convince companies to disclose information about their environmental and social performance (Elkington 1998, Jira and Toffel 2013). As a result, the number of companies worldwide that have voluntarily issued corporate environmental or sustainability reports has increased dramatically since such reports first appeared a quarter century ago. As of 2013, nearly all of the 100 largest companies in Japan, Malaysia, Indonesia, South Africa, Denmark, France, and the United Kingdom had issued environmental reports and more than 86% of such companies in the United States had done so (KPMG 2013). Moreover, the Global Reporting Initiative (GRI) describes scores of environmental indicators and urges companies to report many of them. Companies doing so have touted the fact that their environmental reports have higher GRI "grades."

An important unresolved question of theoretical and practical importance is whether the increasing prevalence of environmental information disclosure is an increase in actual corporate transparency and accountability or merely symbolic action. That is, when firms disclose information about their operations, are they providing a full and accurate picture or are they selective in the details revealed to manage audience impression? Research several decades ago indicated that the corporate strategy of keeping "secret the information that might be necessary or useful for evaluating organizational results" was commonplace (Pfeffer 1981, p. 30). For example, Abrahamson and Park (1994) found that corporations avoid disclosing negative financial information unless they are actively monitored by their boards and investors. This research suggests that corporations strategically vary the types and amount of information they publicly disclose depending on how it reflects on them. Understanding such processes of selective disclosure is particularly important in today's corporate environment. As Bromley and Powell (2012, p. 483) conclude in their review of firms' symbolic strategies, "[t]he pervasive spread of rationalizing trends in society, such as the ... increasing emphases on accountability and transparency, has [led to] growing pressure on organizations to align their policies and practices, and to conform to pressures in an expanding array of domains."

Prior research suggests that firms' social and environmental performance are frequently the domain of symbolic action. For instance, products alleged to cause breast cancer have nonetheless been labeled with pink ribbons to convey their manufacturers' support for breast cancer research (Breast Cancer Action 2011). Some companies participating in the United Nations Global Compact have been accused of "bluewashing" by affiliating with the United Nations brand and the Compact's lofty principles to deflect attention from less savory management practices (Williams 2004). Greenwashing, the focus of our study, is portrayed as a common type of selective disclosure whereby firms "mislead consumers about their [actual] environmental performance" (Delmas and Burbano 2011, p. 64) to create a false impression of transparency and accountability. Our investigation seeks to identify organizational and institutional characteristics that predict when corporate environmental disclosure indicates greater accountability or greater symbolic action in the form of greenwashing.

Organizational and Institutional Deterrents of Selective Disclosure

To understand the organizational processes underlying the extent to which corporate environmental information disclosures constitute substantive or selective disclosures, we hypothesize a set of factors that heighten companies' exposure to scrutiny and global norms, both of which we theorize will deter selective disclosure. Whereas prior research has focused on how governmental attention may reduce firms' symbolic action (e.g., Short and Toffel 2010, Marquis and Qian 2014), less considered are the effects of firms' more general institutional environments—including civil society—on the likelihood of organizational symbolism.

Building on prior research on institutional and activist pressure on organizations (King and Pearce 2010), our theory and hypotheses identify two distinct mechanisms—scrutiny and the diffusion of global norms—that limit firms' symbolic activity. Thus, our theoretical scope goes beyond existing studies of the U.S. context (Kim and Lyon 2011, 2015) and more accurately identifies how types of institutional variation—political systems and development stages of civil society—affect symbolic processes. In our theory below, we argue that certain organizational characteristics increase the likelihood that an organization is exposed to these mechanisms. Prior research suggests that more visible firms are subject to more scrutiny, leading them to temper illegitimate behaviors (Bansal and Roth 2000, King 2008). The presumed mechanism leading to this relationship is greater perceived reputational risk. More visible firms receive more attention from external stakeholders, which might expose illegitimate behaviors that damage firms' reputations. This causes more visible firms to limit such behavior.

We posit that environmentally damaging firms will be less likely to engage in selective disclosure. Furthermore, we theorize how the effects of this organizational characteristic will vary depending on civil society processes in a firm's headquarters country that make it more likely that such firms will experience scrutiny and be exposed to new global norms, making environmental issues more salient for corporate leaders. We focus on the countries of firms' corporate headquarters because this is the institutional environment of most senior manager decision makers, board members, and shareholders who attend annual meetings—and thus the institutional environment with the most influence on corporate decisions (Guler et al. 2002).

Scrutiny and Selective Disclosure

Prior research provides conflicting theories and predictions on whether firms with strong environmental performance are less or more prone to selective disclosure than weak performers. On the one hand, higher-performing firms might be less prone to selective disclosure because they have less to hide. Indeed, comprehensively disclosing their environmental performance can legitimately convey their superior environmental position to stakeholders. Supporting this argument, the accounting literature suggests that firms are motivated to voluntarily disclose only information that bolsters their reputations (Dye 2001). Pursuant to this theory, poorly performing firms would engage in selective disclosure by disclosing only those environmental indicators that enhanced their reputations while cloaking the others.

On the other hand, the corporate environmental disclosure literature suggests that companies causing more environmental damage are subjected to greater external pressure and are *more* likely to comply with institutional pressures to voluntarily disclose environmental information (Short and Toffel 2008, Cho and Roberts 2010). Several studies have shown that organizations' greater visibility leads them to comply with institutional demands because they are likely to receive more attention—and hence pressure—from a variety of external sources (Bansal and Roth 2000, King 2008). Whereas organizational visibility is frequently associated with firms' size, reputation, and public relations strategy (e.g., Bartley and Child 2014, King and McDonnell 2015), we argue that de facto environmental damage is also a kind of visibility, exposing organizations to attention from regulators and the public. This is in effect a form of "issue visibility" that firms acquire because of their proximity to a particular issue (Jones and Keiser 1987, Neustadl 1990).

For environmental issues in particular, poor performers have high salience because stakeholders can often observe activities with environmental impact (Bansal and Clelland 2004). For example, oil companies with weaker environmental records attracted more media attention when oil spills occurred, perhaps because their low performance made them more visible and thus their negative events more newsworthy (Luo et al. 2012). Environmental groups have relied on Toxic Release Inventory data publicized by the EPA to generate reports of top polluters specifically to invite public pressure (Wolf 1996). Such scrutiny dissuades companies from selective disclosure because getting caught at it can significantly damage their reputations (Lyon and Maxwell 2011). Therefore, we hypothesize the following:

Hypothesis 1 (H1). *Companies causing more environmental damage will exhibit less selective disclosure.*

Given firms' de facto environmental damage, the institutions in which firms are situated can also exert scrutiny that deters selective disclosure. Institutions that mobilize action and the ability of actors to speak up increase the likelihood and expected costs of getting caught at selective disclosure (e.g., Bagnoli and Watts 2014). In our context, examples of such mobilization abound. For instance, when countries and nongovernmental organizations (NGOs) organize to pressure companies and governments to address global environmental issues (for example, United Nations conventions to prevent climate change), firms likely perceive greater scrutiny regarding their environmental behavior—including their environmental disclosures. Evidence suggests that instead of having a direct effect on selective disclosure, increased scrutiny imposed by activists moderates the effect of firms' environmental damage posited in H1 (Reid and Toffel 2009, Lyon and Maxwell 2011).

Whereas prior approaches have mainly focused on measuring social movement pressure as boycotts, protests, and other activist actions targeting particular firms (e.g., King 2008), we hypothesize that particular country-level institutional features will bolster a number of distinct civil society pressure on firms to refrain from selective disclosure and disclose more representative environmental information. Furthermore, prior research on activists and greenwashing has typically been conducted only in the U.S. context, where the robustness of civil society is taken for granted (Kim and Lyon 2011, 2015). The key features we examine include the presence of activists and the legal protections afforded to civil and political actions in a global context across not just democratic but also autocratic polities. In this way, we provide a more refined and accurate conceptualization of how these factors may affect symbolic processes. We expect that each of these institutional features will accentuate the tendency for more visible firms—in our context, those causing more environmental damage—to avoid selective disclosure.

Civil Society's Ability to Mobilize. Significant research has shown that social activists' influence on corporate behavior relies ultimately on collective action, citizen pressure, and sometimes consumer boycotts (King and Pearce 2010). Evidence indicates that companies' strategies and management practices are influenced by a wide array of collective action by activists (Eesley and Lenox 2006, King 2008, Lenox and Eesley 2009, Reid and Toffel 2009). For instance, several major global apparel makers, seeking to avoid a sweatshop stigma that activists threatened to impose, adopted voluntary codes of conduct and internal compliance-monitoring programs (Locke 2013). And in our context, it has been shown that activism focused on companies' environmental issues improves their environmental performance (e.g., Delmas and Toffel 2008, Chatterji and Toffel 2010) and may even dissuade companies from participating in voluntary environmental programs that activists might view negatively (Kim and Lyon 2011).

Activists are more likely to influence company behavior when they attract media attention to their cause because media coverage intensifies societal attention (King 2008). This often leads activists to consider potential media coverage when they select which companies to target for scrutiny, which, in turn, often leads them to select the most visible companies as well as those struggling with the issues the activists are concerned about (Rehbein et al. 2004). This would lead environmental activists to target for scrutiny those companies causing more environmental damage. Institutional settings possessing strong civil society defenders of particular norms pose a threat to firms whose behaviors already stretch the boundaries of legitimacy.

Crucial to civil society's potential to influence company behavior is the ability to organize "collective vehicles ... through which people mobilize and engage in collective action" (McAdam et al. 1996, p. 3). For many movements, the local presence of NGOs has been shown to be a key organizational mechanism of citizenry mobilization and activism (Sine and Lee 2009), magnifying individual voices to intensify pressure on companies. In our context, this suggests that institutional settings with strong environmental activist pressures, such as those with many environmental NGOs, compound the risk of scrutiny for companies causing more environmental damage. This makes such companies even more likely to avoid selective disclosure regarding their environmental performance.

Hypothesis 2 (H2). *Companies causing more environmental damage will exhibit particularly low levels of selective disclosure when headquartered in countries with more environmental NGOs.*

Civil Society's Ability to Speak Up. We propose that strong civil liberties and political rights are critical components that enable civil society scrutiny to deter environmentally damaging companies from selective disclosure.

Actors seeking to enforce global norms of accountability and environmental transparency rely on the ability to speak up to pressure companies to conform. Most prior studies have examined the effects of speech on action in settings where there are strong institutions protecting those seeking to engage in collective action and where the ability to speak up is taken for granted (King and Pearce 2010). Strong civil liberties and political rights secure the ability of civil society actors to criticize corporate behavior, to take social action, and to lobby for political support when companies violate global norms. This ability is far less secure in regimes that do not afford these rights. Discussing "civic environmentalism," Steinberg (2002, p. 26) argued that the "challenges of sustained collective action are compounded when . . . the expression of dissenting views [is] considered a threat by state authorities."

The more environmental damage a firm causes, the more salient that damage is likely to be to civil society actors (as discussed in the argument for H2). In settings where greater civil liberties and political rights make it easier to scrutinize corporate behavior and speak up about it, corporate leaders of more environmentally damaging firms will be especially concerned that selective disclosure would be exposed by the local press or civil society actors (Campbell 2005, King 2008). Thus, we propose that firms causing more environmental damage will be particularly concerned about scrutiny and so especially unlikely to engage in selective disclosure when headquartered in countries that provide greater civil liberties and political rights.

Hypothesis 3 (H3). *Companies causing more environmental damage will exhibit particularly low levels of selective disclosure when headquartered in countries with strong civil liberties and political rights.*

Information Diffusion and Normative Expectations Regarding Selective Disclosure

As the networks linking countries, organizations, and individuals expand and intensify, the global norms of information disclosure and transparency have become more widely disseminated (Aguilera and Jackson 2010). We examine two processes by which the effect a firm's environmental damage has on its use of selective disclosure can be accentuated by the diffusion of global norms.

First, firms headquartered in places where civil society is more exposed to global norms face growing pressures to avoid contradicting these global norms. Whereas the previously hypothesized activism mechanism relies on coercion through the threat of NGO and political activism, an information diffusion mechanism relies on firms adapting to global norms as they become more aware of them. Second, companies learn about global trends, such as environmental disclosure, not only by being in institutional contexts well connected to global society, but also through direct exposure to foreign financial governance rules and to foreign investors.

Civil Society's Exposure to Global Norms. A population's exposure to new ideas and norms from other countries is a complex process that can result from international trade, employment of foreigners, interactions with foreign embassies and consulates, telephone and Internet information flows, and international tourism. Such information diffusion mechanisms are important to understand because the globalization of societies is "mediated through a variety of flows including people, information and ideas, capital and goods" (Dreher 2006, p. 1092). Such exposure brings about a "norm cascade," found in many contexts, whereby a norm diffuses across international borders, becomes taken for granted, and influences the activities of individuals and organizations around the world (Risse-Kappen et al. 1999). Research has also shown that the diffusion of global norms is particularly likely among a country's elite, including corporate executives, because they are more likely to be part of global networks (Reimann 2001). When a country's civil society is more exposed to global norms, such as the increasing expectations of corporate accountability and corporate environmental transparency, these issues will become more salient to that country's corporate leaders.

Access to global information trends affects a society's normative expectations of firms (Guler et al. 2002). We argue that such information will be particularly influential for companies causing more environmental damage. Managers of particularly visible firms are thought to view themselves as being especially vulnerable to future critique (Bartley and Child 2011). Because environmentally damaging firms are especially attuned to the reputational risks of their operations (as discussed in the argument for H1), we expect them to perceive even greater reputational risk when they are exposed to global environmental norms. Therefore, they will be even more likely than the average firm to temper their selective disclosure.

Hypothesis 4 (H4). *Companies causing more environmental damage will exhibit particularly low levels of selective disclosure when headquartered in countries that are more connected to global society.*

Corporate Internationalization. Another key process that affects a company's recognition of global norms such as environmental disclosure is the extent to which its business operations are directly connected to the global society. A key way companies connect to the global society is to list or cross-list their shares on foreign stock exchanges. This tends to expose them to reporting requirements—regarding governance and financial matters—that are more stringent than those in their home countries (Davis and Marquis 2005). Foreign listings typically require companies to be more transparent about their accounting policies, board and management structure, and ownership structure (Khanna et al. 2004). These heightened transparency standards, which are audited and legally enforced, require companies to more comprehensively report and accurately convey their financial indicators. Not only do such companies have fewer opportunities for selective disclosure in corporate financial reporting, but they also gain exposure to norms and practices valuing more comprehensive transparency.

In line with a growing literature in finance and international business (Karolyi 2006), we posit that there will be a spillover effect whereby the company learns that more stringent standards and scrutiny exist and recognizes that it may face them in the future. Davis and Marquis (2005), for instance, showed how such global exposure increased the likelihood that international firms adhered to U.S. practices of voluntarily disclosing certain governance information. Similarly, after cross-listing in the United States, firms from 40 countries were more likely to follow the U.S. practice of voluntarily disclosing management earnings forecasts (Shi et al. 2012). Other studies in this line of research have shown that Anglo-American CEO compensation practices spread to Scandinavian firms after they listed on Anglo-American exchanges (Oxelheim and Randoy 2005).

We argue that through this spillover process, many managers of foreign-listed corporations will come to internalize norms and practices of transparency as a legitimate and appropriate behavior expected of companies, making it less likely for them to engage in selective disclosure. Because firms causing more environmental damage are particularly attuned to regulatory signals and societal normative expectations as argued previously, the internalization of norms of transparency will be accentuated once they are exposed to the foreign capital market.

Hypothesis 5 (H5). *Environmentally damaging companies listed on foreign stock exchanges will exhibit less selective disclosure.*

Data and Measures

Sample

To test our hypotheses, we gathered data on the companies listed on the following major stock indices during 2004–2007: ASX 200, Dow Jones STOXX Europe 600, FTSE All Share, MSCI Asia ex Japan, MSCI World, Nikkei 225, Russell 1000, and S&P 500. This sampling frame was determined by the coverage at that time of Trucost Plc., an organization established in 2000 to develop a more sophisticated approach to calculating the environmental impacts of company operations, supply chains, and investment portfolios.[1] To construct our measures of selective disclosure and environmental damage, as described below, we purchased from Trucost a panel of 15,108 firm-year observations from 4,787 firms over this four-year period; the panel is unbalanced because of annual changes in index membership and slight changes in the size of some indices.[2] To construct our estimation sample, we dropped a total of 37 firms (71 firm-year observations) for three reasons: 3 firms (8 firm-year observations) were missing an industry classification, 15 firms (18 observations) were headquartered in countries from which we had fewer than 5 firm-year observations, and 19 firms (45 observations) were from 4 countries in which none of the firms in our panel had disclosures.[3] This resulted in an estimation sample of 15,037 observations from 4,750 companies headquartered in 45 countries: 3,227 observations in 2004, 3,832 in 2005, 4,104 in 2006, and 3,874 in 2007. The distributions of industries and headquarters countries for the companies in our sample are reported in Tables A1 and A2 in Online Appendix A (available as supplemental material at http://dx.doi.org/10.1287/orsc.2015.1039).[4]

Dependent Variable

Our dependent variable, *selective disclosure magnitude*, represents the extent to which companies risk creating a misleading impression of transparency and accountability by disclosing relatively benign environmental metrics rather than those more representative of their overall environmental harm. This is a form of greenwashing because it involves a company conveying accurate but selective environmental information that creates a misleading impression of its overall environmental performance (Delmas and Burbano 2011, Kim and Lyon 2011, Lyon and Maxwell 2011, Bowen 2014). *Selective disclosure magnitude* is calculated as the difference between two ratios that Trucost developed to assess companies' environmental transparency; that is, *absolute disclosure ratio* minus *weighted disclosure ratio*.[5] This measure is aligned with Lyon and Maxwell (2011, p. 5), given their conclusion that "greenwash can be characterized as the selective disclosure of positive information about a company's environmental or social performance, while withholding negative information on these dimensions." *Selective disclosure magnitude* seeks to measure the extent to which symbolic transparency (measured by *absolute disclosure ratio*) exceeds substantive transparency (measured by *weighted disclosure ratio*). Online Appendix B describes the construction of *selective disclosure magnitude* in more detail; further information about Trucost's methodology is available from Trucost Plc. (2008).[6]

Briefly, the *absolute disclosure ratio* is the proportion of relevant environmental indicators for which a company publicly discloses quantitative worldwide figures. The denominator of this ratio is the number of environmental indicators relevant to a particular company based on the industries in which it operates. Trucost identifies this relevant set for each company based on data from pollution release and transfer registries, economic input-output models, and company reports.[7] The numerator is the number of these indicators that the company publicly discloses in, for example, its annual reports, regulatory filings, and corporate website. The *weighted disclosure ratio* takes this concept a step further by incorporating the extent of environmental impact associated with each environmental indicator.[8] In short, the *absolute disclosure ratio* reflects how many of the relevant environmental indicators the company disclosed—regardless of their relative importance—and the *weighted disclosure ratio* shows how much of the most important information was disclosed.

When a company's *absolute disclosure ratio* exceeds its *weighted disclosure ratio*, *selective disclosure magnitude* is positive, which indicates that the company disclosed its less harmful indicators.[9] *Selective disclosure magnitude* approaches its maximum value of 1 when a company discloses many of its less harmful indicators but few if any of its more harmful indicators. Such a company could easily create the impression of transparency while in fact hiding quite a lot. In contrast, a company disclosing just the few indicators that matter most in terms of its environmental harm will have a *selective disclosure magnitude* tending toward the minimum value of -1.[10]

Independent Variables

To measure a firm's *environmental damage*, we use Trucost's estimate of environmental impact, which is based on the following process described in Thomas et al. (2007) and Trucost Plc. (2008). First, Trucost allocates a company's annual revenues to a subset of a standardized set of 464 industries (typically one to a few dozen of these industries for each company), based on data from the FactSet Fundamentals database, corporate annual reports, corporate regulatory filings, and feedback from the company. Second, Trucost's model estimates the company's total annual tonnage of pollution emissions released (to air, land, and water) and resources consumed (such as metals, water, oil, natural gas, and mined materials), based on the company's revenues from each industry. These calculations are based on environmental factors derived from several pollution release and transfer registries (national databases with inventories of natural resources and pollutants associated with many establishments in various industries) and economic input–output models (which model trade between suppliers and buyers). Third, these physical quantities are multiplied by their respective environmental damage cost factors, which are drawn from academic research on the pricing of environmental externalities and refer to costs "borne by society through the degradation of the environment but which [are] not borne by the firm that uses the resource or emits the pollutant" (Trucost Plc. 2008, p. 4).[11] The total represents the cost of the environmental damage created by each company in a particular year in millions of U.S. dollars. For our variable, *environmental damage*, we log Trucost's environmental damage cost to accommodate its skewed distribution.

We measured three aspects of the civil society institutions of each company's headquarters country.[12] We measure the density of environmental NGOs in each company's headquarters country as the number of *environmental NGOs per million population* (Esty et al. 2005). Specifically, we divide the number of International Union for Conservation of Nature (IUCN) member organizations operating in each company's headquarters country in 2003, the year before our sample period, by that country's population in 2004 (measured in millions). IUCN is an international environmental organization with more than 1,000 member organizations, including the most significant international environmental NGOs, such as Conservation International, the National Geographic Society, and the Sierra Club. The presence of such NGOs has frequently been used in the organizational and sociology literatures to proxy local social movement processes (e.g., Tsutsui and Wotipka 2004, Sine and Lee 2009).

We measure a country's *civil liberties and political rights* based on data from annual Freedom in the World reports,[13] which assess civil liberties (such as freedom of expression and assembly) and political rights (such as free elections).[14] We used the annual national averages of political rights and civil liberties scores—an approach used by others (e.g., Tsutsui and Wotipka 2004, Vaaler 2008, Longhofer and Schofer 2010)—and reverse-coded the results so that higher values reflect more civil liberties and political rights.[15]

Based on a general logic of diffusion (e.g., Rogers 1995), we measure the extent to which a country is exposed to global norms using a *globalization index* called the "KOF Index of Globalization." Developed by Dreher and colleagues (Dreher 2006, Dreher et al. 2008)[16] and used by many scholars of globalization (e.g., Fischer 2008), this index is calculated annually for 208 countries and incorporates a country's social, economic, and political integration with other countries (Keohane and Nye 2000). A country's social integration—the flow of international information and norms—is reflected in the KOF index by measures of personal contacts (such as telephone traffic, international tourism, and the proportion of population that are foreigners), information flows (such as the prevalence of Internet access), and cultural proximity (the exchange of ideas abroad, such as the import and export of books as a percent of GDP). Economic integration is measured by trade flow indicators (such as the value of international trade and foreign direct investment, each normalized as percentages of the country's gross domestic product) and trade restrictions (such as import barriers and tariffs). Political integration is represented by measures such as the number of foreign embassies in the country and the number of UN peace missions in which the country has participated.

Using stock exchange listings data from Datastream, we created a dichotomous variable *listed on a foreign stock exchange*, coded 1 for companies that listed their stock on an exchange outside their headquarters country in a given year, and 0 otherwise.

Control Variables

Because establishing or maintaining a company's reputation affects patterns of communication about its social responsibility (McDonnell and King 2013), we controlled for whether a company had a *high reputation* in a given year based on whether the corporation or any of its subsidiaries were included that year in any of the Reputation Institute's 116 high-reputation lists, which are compiled primarily by *Fortune*, Hewitt, Interbrand, and the Reputation Institute.[17] *High reputation* is a dichotomous variable coded 1 for corporations listed on any of these lists in a given year and 0 otherwise. We control for an organization's size using the log of annual *sales*, an approach used in many studies of corporate environmental and social disclosure (e.g., Cho and Patten 2007, Reid and Toffel 2009). We obtained annual corporate-wide sales data reported in millions of U.S. dollars from Compustat and used log values in our models to accommodate the skewed distribution of sales. Because firms more reliant on domestic versus foreign sales might be exposed to or vulnerable to different institutional pressures, we controlled for *percentage of sales to foreign countries*—that is, nonheadquarters countries—using annual data from Worldscope.

Because prior studies have argued and shown that an organization's financial performance influences its environmental disclosure (Barth et al. 1997, Neu et al. 1998), we control for an organization's financial performance using its annual *return on assets*, calculated as net income divided by starting-year assets, both of which we obtained from Compustat. To avoid the undue influence of a few outliers, we winsorized this ratio by recoding values below the 0.1 percentile and values above the 99.9 percentile to those values, respectively. We control for firms' annual *capital intensity*—calculated as the ratio of net property, plant, and equipment to total assets, both obtained from Worldscope—because capital intensity can affect environmental damage and the likelihood of selective disclosure. Capital intensity can also capture important intra-industry variation. We control for a company's annual corporate-wide employment because employees are a powerful group of stakeholders in many societies (Barnett 2007) and large employers may hold disproportionate political power in a country. Because average company employment differs substantially across countries, our measure of *employment* is standardized by country. We obtain employment data from Worldscope.

Because research has revealed very different levels of environmental and social disclosure in different industries (Cho and Patten 2007, Reid and Toffel 2009), we create industry dummies to denote each company's primary two-digit SIC code based on Compustat data.

Because prior research has shown that a country's adoption of environmental practices is influenced by its commitment to engage in global environmental governance (Frank et al. 2000), we control for *intergovernmental environmental organizations*, the number of memberships each country held in 100 major environmental intergovernmental organizations. We obtained these data from the 2001 Environmental Sustainability Index, which standardized these values to a mean of 0 and a standard deviation of 1 based on the raw values from 122 countries.[18] We control for the potential for media attention, which has been shown to be an important mechanism of institutional compliance (King 2008), by using the World Press Freedom Index that is produced annually by Reporters Without Borders (Faccio 2006). We multiplied these annual country-level values by -1 so that higher values of *press freedom* reflect greater freedom.[19] To control for general levels of transparency in a society, we measured each country's *corruption* level each year based on Transparency International's annual Corruption Perceptions Index, which measures the "overall extent of corruption (frequency and/or size of bribes) in the public and political sectors" based on data from several institutions including the Asian Development Bank and the World Economic Forum.[20] We reverse-coded the Corruption Perceptions Index values so that increasing values reflect greater corruption.

Because a country's economic development can affect the diffusion rate of organizational practices (Guler et al. 2002) and can affect environmental practices more generally (Inglehart 1990), we control for each country's *per capita gross domestic product* in a given year. We obtained country-level data on annual gross domestic product, reported in 2005 U.S. dollars, from the World Bank and annual population data from the U.S. Census Bureau, compiled by the U.S. Department of Agriculture's Economic Research Service.[21] To reduce skew, we use logged ratios in our models. Because stringent accounting standards might decrease the likelihood of selective disclosure, we obtained data on a country's *accounting standards stringency* from La Porta et al. (1998), which was based on the comprehensiveness of financial statements from a sample of corporate annual reports. Higher index values indicate more stringent accounting standards. We rescaled the raw index values to range from 0 to 1.

Many companies were headquartered in countries engaged in the Kyoto Protocol and thus were (or might in the future be) required to calculate and disclose greenhouse gas emissions, which might influence their disclosure practices. We control for this actual or potential regulatory pressure by creating an annual country-level dichotomous variable, *Kyoto Protocol ratified*, coded 1 starting the year when the protocol was ratified (or accepted or accessed) and entered into force in that country and 0 in the preceding years. We coded this variable 0 for all years for countries, such as the United States, in which the protocol had not entered into force during our sample period. We distinguished ratifying countries that were required to reduce emissions as part of their Kyoto obligations—all those listed in "Annex 1," such as the United Kingdom—by creating a dichotomous variable *Kyoto Protocol bound,* coded 1 for such countries in the years since the protocol entered into force. We coded this variable 0 for all other countries, including those that ratified the protocol but which lacked such obligations (such as Thailand) and those that did not ratify the protocol.[22] We obtained these data from the United Nations Framework Convention on Climate Change website.[23]

Companies headquartered in countries with poor environmental quality (that is, environmental stress) might face particularly high demands for environmental disclosure, which may lead to disproportionate pressure for selective disclosure. To measure the extent to which pollution and resource consumption are stressing a country's environmental systems, we obtained *environmental stress* values for each country using a composite indicator from the 2002 Environmental Sustainability Index.[24] This measure incorporates emissions and the use of fertilizers and pesticides (all normalized by land area), change in forest cover, per capita natural resource consumption, and projected population growth rates.

Table 1 reports summary statistics.[25] All of our variables are measured annually except three country-level variables for which we could not obtain annual data corresponding to our sample period (*environmental NGOs per million population*, *intergovernmental environmental organizations*, and *accounting standards stringency*). For those three variables, we used the most recent values available before our sample period.

Empirical Analysis

Our models predict *selective disclosure magnitude* based on all of the independent variables and control variables described above. We also include a full set of year dummies to control for overall temporal trends. To facilitate interpretation, we standardize the four variables included in interaction terms: *environmental damage, environmental NGOs per million population, civil liberties and political rights*, and *globalization index*. To address concerns associated with multicollinearity, we test each moderated relationship by including each interaction term in a distinct model.

For each of the variables for which we recoded missing values to 0, we included a corresponding dichotomous variable coded 1 to denote observations which had been recoded and 0 otherwise (Maddala 1977, p. 202; Greene 2007, p. 62). This approach, common in econometric analysis, is algebraically equivalent to recoding missing values with the variable's mean (Greene 2007, p. 62).[26] Nearly identical coefficient magnitudes and standard errors resulted from two alternative approaches to accommodate missing values: (1) using multiple imputation with our primary hierarchical linear model estimation

Table 1 Summary Statistics

	Mean	SD	Min	Max
Selective disclosure magnitude	−0.10	0.23	−0.94	0.63
Absolute disclosure ratio	0.05	0.13	0.00	1.00
Weighted disclosure ratio	0.15	0.31	0.00	1.00
Environmental damage§	2.09	1.98	0.00	6.49
Environmental NGOs per million population§	0.53	0.48	0	1.63
Civil liberties and political rights§	5.33	1.60	0	6
Globalization index§	0.73	0.20	0	0.90
Listed on a foreign stock exchange	0.72	0.45	0	1
Percentage of sales to foreign countries§	0.12	0.24	0	0.78
Sales§	7.34	1.98	0	10.25
High reputation	0.13	0.34	0	1
Return on assets	0.07	0.15	−2.71	1.36
Capital intensity	0.30	0.26	0	1
Employment†	0.05	1.02	−1.43	29.48
Intergovernmental environmental organizations	1.42	0.77	−0.88	2.54
Press freedom	0.87	0.16	0	1
Corruption	2.61	1.54	0	8
Per capita gross domestic product	10.22	1.09	0	11.31
Accounting standards stringency	0.67	0.16	0	0.83
Kyoto Protocol ratified	0.47	0.50	0	1
Kyoto Protocol bound	0.26	0.44	0	1
Environmental stress	0.30	0.15	0	0.65
Kyoto progress	1.46	5.94	−25.80	32.50
Ahead of Kyoto	0.20	0.40	0	1

Notes. $N = 15{,}037$ firm-year observations pertaining to 4,750 firms headquartered in 45 countries. §Denotes winsorized (top-coded) at the 95th percentile. †Denotes standardized by country. The following variables were standardized for use in the regression model (such that mean = 0 and SD = 1), which resulted in the following minimum and maximum values: *environmental damage* (−1.05, 2.23), *environmental NGOs per million population* (−1.11, 2.32), *civil liberties and political rights* (−3.33, 0.42), and *globalization index* (−3.69, 0.87).

Table 2 Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Selective disclosure magnitude	1.00																		
(2) Environmental damage§	−0.43	1.00																	
(3) Environmental NGOs per million population§	−0.07	−0.13	1.00																
(4) Civil liberties and political rights§	−0.08	−0.04	0.36	1.00															
(5) Globalization index§	−0.09	−0.01	0.53	0.56	1.00														
(6) Listed on a foreign stock exchange	−0.10	0.11	0.04	0.06	0.16	1.00													
(7) Percentage of sales to foreign countries§	−0.13	0.13	0.15	−0.03	0.01	0.04	1.00												
(8) Sales§	−0.23	0.45	−0.24	0.05	0.03	0.23	0.12	1.00											
(9) High reputation	−0.10	0.19	−0.11	0.10	0.07	0.15	−0.04	0.32	1.00										
(10) Return on assets	0.00	0.05	0.01	−0.05	−0.04	0.01	0.00	0.07	−0.01	1.00									
(11) Capital intensity	−0.17	0.39	0.02	−0.07	−0.03	−0.03	−0.02	−0.02	−0.05	0.04	1.00								
(12) Employment†	−0.15	0.23	0.01	0.00	0.00	0.10	0.09	0.36	0.21	−0.02	0.00	1.00							
(13) Intergovernmental environmental organizations	−0.11	−0.06	0.23	0.64	0.53	0.01	−0.01	0.05	0.06	−0.07	−0.12	0.00	1.00						
(14) Press freedom	−0.07	−0.04	0.28	0.57	0.28	0.06	0.06	0.03	0.03	−0.05	−0.05	0.00	0.54	1.00					
(15) Corruption	0.05	0.12	−0.60	−0.41	−0.32	−0.16	−0.06	0.11	0.00	0.06	0.04	0.00	−0.40	−0.46	1.00				
(16) Per capita gross domestic product	−0.01	−0.06	0.26	0.38	0.28	0.18	0.01	0.04	0.08	−0.08	−0.06	−0.01	0.41	0.43	−0.68	1.00			
(17) Accounting standards stringency	−0.03	−0.09	0.29	0.44	0.25	0.02	−0.07	−0.06	0.05	−0.02	−0.03	0.00	0.41	0.68	−0.54	0.38	1.00		
(18) Kyoto Protocol ratified	−0.12	−0.01	0.16	−0.07	0.17	−0.15	0.19	−0.04	−0.16	−0.01	−0.01	0.01	0.19	−0.05	0.08	−0.19	−0.14	1.00	
(19) Kyoto Protocol bound	−0.10	−0.12	0.43	0.24	0.32	−0.06	0.12	−0.10	−0.10	−0.02	−0.08	0.01	0.54	0.23	−0.30	0.17	0.10	0.62	1.00
(20) Environmental stress	−0.06	0.13	0.05	0.12	0.36	0.11	0.12	0.08	0.03	0.06	0.06	0.01	−0.10	−0.13	0.39	−0.36	−0.25	0.10	−0.15

Notes. $N = 15{,}037$ firm-year observations pertaining to 4,750 firms headquartered in 45 countries. §Denotes winsorized (top-coded) at the 95th percentile. †Denotes standardized by country.

approach and (2) using structural equation modeling with full information maximum likelihood (Enders and Bandalos 2001).

Regression Results

We estimate our models using multilevel mixed-effects linear regression (a flexible form of a hierarchical linear model or HLM) that accounts for the multilevel structure of our panel data—which nests firms' multiple observations over time within their headquarter country—and allows for both fixed and random effects. We report standard errors clustered by country.[27] Table 3 presents our results.

Model 1 includes only direct effects. A likelihood ratio test comparing the fitted mixed model to standard regression with no group-level random effects rejects the null that all random-effects parameters of the mixed model are simultaneously zero ($\chi^2 = 4756.1$, $p < 0.01$). The statistically significant negative coefficient on *environmental damage* in Model 1 indicates that organizations causing more environmental damage exhibit less selective disclosure, which supports H1.[28] The coefficient on this standardized variable indicates that a one-standard-deviation increase in *environmental damage* is associated with a 0.10 decline in *selective disclosure magnitude*, the equivalent of nearly one-half a standard deviation (calculated as $\beta_{\text{environmental damage}} \div SD_{\text{selective disclosure magnitude}} = -0.093 \div 0.23 = -0.40$).

The significant negative coefficient on the interaction term between *environmental NGOs per million population* and *environmental damage* in Model 2 indicates that firms causing more environmental damage are especially less prone to selective disclosure when there is a greater NGO presence in their countries, a result that supports H2. Figure 1 graphically illustrates this effect. Average predicted values indicate that firms causing more environmental damage engage in less selective disclosure and that this relationship is especially pronounced in countries with more environmental NGOs per capita.[29]

The statistically significant negative coefficient on the interaction term in Model 3 indicates that companies causing more *environmental damage* are especially disinclined to selective disclosure in countries featuring more *civil liberties and political rights*. This finding supports H3, and this relationship is depicted in Figure 2. Average predicted values indicate that *selective disclosure magnitude* declines as *environmental damage* increases and show that a higher level of *civil liberties and political rights* significantly exacerbate the decline.[30] This relationship supports our theory that firms causing more environmental damage are especially likely to avoid selective disclosure when they operate in environments with greater scrutiny.

The significant negative coefficient on the interaction term between *environmental damage* and *globalization index* in Model 4 indicates that greater environmental damage is associated with less selective disclosure in more highly globalized countries, lending support to H4 (and see also Figure 3). Average predicted values of *selective disclosure magnitude* decline as *environmental damage* increases, and the decline is significantly more rapid among companies headquartered in highly globalized countries.[31] The statistically significant negative coefficient on the interaction term in Model 5 indicates that greater environmental damage is associated with a more pronounced decline in selective disclosure for companies listed on foreign exchanges than for those not listed on foreign exchanges, lending support to H5.[32] Figure 4 graphically displays this relationship.

This set of findings supports our theory of how exposure to global norms of information transparency through both home country characteristics and firm attributes influences firms' selective disclosure. We discuss the broader theoretical implications of our findings below.

Extension: The Impact of Visibility and Scrutiny on Firms' Disclosure Levels

Whereas the results above confirm that many of our hypothesized constructs influence *selective disclosure magnitude,* we conducted additional analyses to better understand the mechanisms underlying these relationships. Recall that *selective disclosure magnitude* is calculated as the difference between two ratios to measure the extent to which companies disclose relatively benign environmental metrics rather than those more representative of their overall environmental harm. The predicted declines in selective disclosure that we hypothesize might be driven by (a) weighted disclosure *increasing more* than absolute disclosure or by (b) weighted disclosure *declining less* than absolute disclosure. To determine which of these scenarios was driving our results, we estimated separate HLM regressions predicting the *absolute disclosure ratio* and the *weighted disclosure ratio*—the components of *selective disclosure magnitude*—based on all the independent and control variables from our primary models.

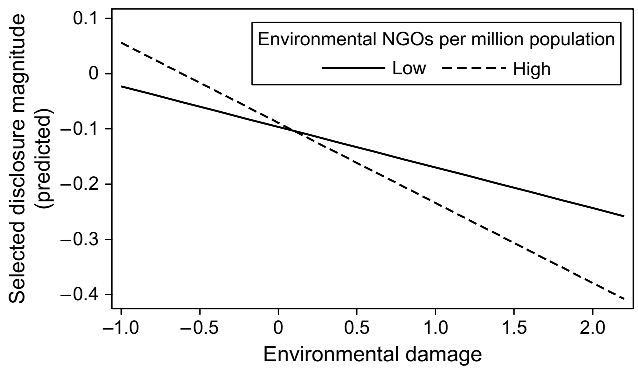
Columns 1a and 1b in Table 4 report results of the models that decompose the effects of Model 1 reported in Table 3. The positive coefficient on *environmental damage* is of greater magnitude in Model 1b than in Model 1a, which indicates that more environmental damage is associated with a greater increase in substantive disclosure (*weighted disclosure ratio*) than in symbolic disclosure (*absolute disclosure ratio*). This supports our intuition that more environmentally damaging firms really do exhibit more substantive disclosure.[33] The coefficients on the interaction terms are near zero and nonsignificant in Models 2a, 3a, and 4a, which predict *absolute disclosure ratio*, but they are consistently significant and positive in Models 2b, 3b, and 4b, which predict *weighted disclosure ratio*. This indicates that the institutions that seem to deter more environmentally damaging firms from selectively disclosing appear to have this effect by encouraging such firms to report more relevant environmental indicators.

Table 3 Regression Results of Primary Models

Dependent variable: Selective disclosure magnitude		(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
H1	Environmental damage§¤	−0.093** [0.009]	−0.095** [0.009]	−0.095** [0.008]	−0.094** [0.008]	−0.072** [0.010]
H2	Environmental NGOs per million population§¤ × Environmental damage§¤		−0.022** [0.004]			
	Environmental NGOs per million population§¤	0.005 [0.016]	0.002 [0.016]	0.004 [0.015]	0.004 [0.015]	0.005 [0.015]
H3	Civil liberties and political rights§¤ × Environmental damage§¤			−0.013** [0.004]		
	Civil liberties and political rights§¤	0.002 [0.014]	0.003 [0.013]	0.004 [0.014]	0.003 [0.013]	0.002 [0.014]
H4	Globalization index§¤ × Environmental damage§¤				−0.018** [0.006]	
	Globalization index§¤	−0.108** [0.013]	−0.106** [0.014]	−0.106** [0.013]	−0.104** [0.013]	−0.103** [0.013]
H5	Listed on a foreign stock exchange Environmental damage§¤					−0.027** [0.009]
	Listed on a foreign stock exchange	−0.029** [0.005]	−0.028** [0.005]	−0.028** [0.005]	−0.028** [0.004]	−0.034** [0.006]
Firm-level controls	Percentage of sales to foreign countries§¤	−0.005* [0.002]	−0.004+ [0.002]	−0.005* [0.003]	−0.004+ [0.002]	−0.005* [0.002]
	Sales§¤	−0.011 [0.010]	−0.009 [0.010]	−0.010 [0.010]	−0.010 [0.010]	−0.012 [0.010]
	High reputation	−0.016+ [0.008]	−0.018* [0.008]	−0.015+ [0.009]	−0.015+ [0.008]	−0.015+ [0.008]
	Return on assets	−0.002 [0.005]	−0.000 [0.005]	−0.001 [0.005]	−0.001 [0.005]	−0.002 [0.005]
	Capital intensity	−0.054** [0.011]	−0.054** [0.012]	−0.054** [0.011]	−0.053** [0.012]	−0.052** [0.011]
	Employment†	−0.004 [0.003]	−0.004 [0.003]	−0.004 [0.003]	−0.004 [0.003]	−0.004 [0.003]
Country-level controls	Intergovernmental environmental organizations	−0.032** [0.010]	−0.032** [0.010]	−0.033** [0.010]	−0.033** [0.010]	−0.031** [0.010]
	Press freedom	−0.064 [0.052]	−0.057 [0.049]	−0.056 [0.052]	−0.068 [0.047]	−0.069 [0.051]
	Corruption	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]	0.012 [0.009]
	Per capita gross domestic product	0.068** [0.011]	0.066** [0.011]	0.065** [0.011]	0.066** [0.011]	0.067** [0.011]
	Accounting standards stringency	0.050 [0.118]	0.061 [0.117]	0.056 [0.120]	0.053 [0.118]	0.059 [0.117]
	Kyoto Protocol ratified	0.001 [0.009]	0.001 [0.009]	0.000 [0.009]	0.003 [0.009]	0.001 [0.009]
	Kyoto Protocol bound	−0.006 [0.007]	−0.006 [0.007]	−0.005 [0.007]	−0.006 [0.007]	−0.006 [0.007]
	Environmental stress	0.019 [0.063]	0.018 [0.066]	0.019 [0.063]	0.015 [0.063]	0.018 [0.062]
	Year dummies	Included	Included	Included	Included	Included
	Industry dummies	Included	Included	Included	Included	Included

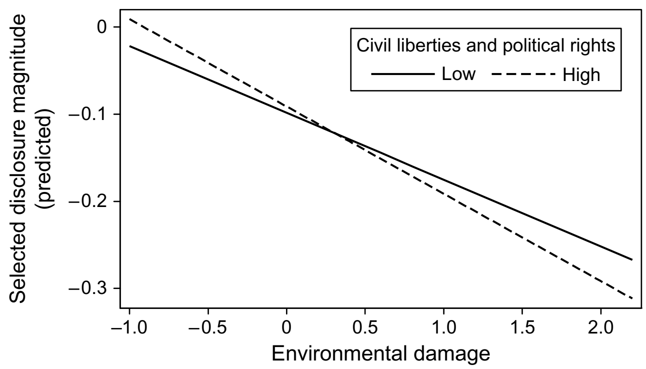
Notes. Regression coefficients of a hierarchical linear model with firms nested within headquarters countries. Brackets contain standard errors clustered by country; $^{**}p < 0.01$; $^{*}p < 0.05$; $^{+}p < 0.10$. For all models, $N = 15{,}037$ firm-year observations pertaining to 4,750 firms headquartered in 45 countries. §Denotes winsorized (top-coded) at the 95th percentile. ¤Denotes standardized variables. †Denotes standardized by country. All models also include dummy variables denoting instances where missing values of the following variables were recoded to 0: the country's *globalization index*, *civil liberties and political rights*, *environmental NGOs per million population*, *intergovernmental environmental organizations, accounting standards stringency*, and *environmental stress* and the organization's *percentage of sales to foreign countries* and *employment*.

Figure 1 Graphing H2 Results



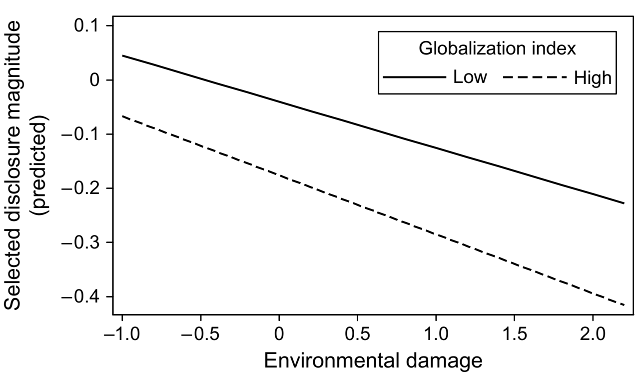
Notes. Selective disclosure is less prevalent among firms causing greater environmental damage. This relationship is especially pronounced among companies headquartered in countries with higher scrutiny, as indicated by more environmental NGOs. This figure depicts average predicted values generated from Model 2 of Table 3. The lines represent the average predicted values generated by each observation's actual values, except *environmental damage* is estimated at each labeled value and *environmental NGOs per million population* is estimated at the following fixed points. The solid line depicts estimates made at the 5th percentile of *environmental NGOs per million population*, which reflects institutional environments with a low density of environmental activists. The dashed line depicts estimates at the 95th percentile of *environmental NGOs per million population*, which reflects institutional environments with a high density of environmental activists.

Figure 2 Graphing H3 Results



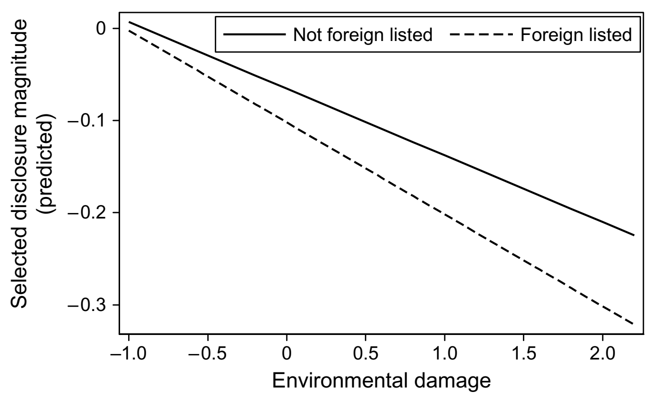
Notes. Selective disclosure is less prevalent among firms causing greater environmental damage. This relationship is especially pronounced among companies headquartered in countries with higher potential for scrutiny, as indicated by high levels of civil liberties and political rights. This figure depicts average predicted values generated from Model 3 of Table 3. The lines represent the average predicted values generated by each observation's actual values, except *environmental damage* is estimated at each labeled value and the following fixed points. The solid line depicts estimates made at the 5th percentile of *civil liberties and political rights*, which reflects institutional environments with few such liberties and rights. The dashed line depicts estimates at the 95th percentile of *civil liberties and political rights*, which reflects institutional environments with a high level of such liberties and rights.

Figure 3 Graphing H4 Results



Notes. Selective disclosure is less prevalent among firms causing greater environmental damage. This relationship is especially pronounced among companies headquartered in countries with higher normative expectations regarding selective disclosure via a high level of connection to global society. This figure depicts average predicted values generated from Model 4 of Table 3. The lines represent the average predicted values generated by each observation's actual values, except *environmental damage* is estimated at each labeled value and the following fixed points. The solid line depicts estimates made at the 5th percentile of *globalization index*, which reflects institutional environments with a low level of globalization. The dashed line depicts estimates at the 95th percentile of *globalization index*, which reflects institutional environments with a high level of globalization.

Figure 4 Graphing H5 Results



Notes. Selective disclosure is less prevalent among firms with causing environmental damage. This relationship is especially pronounced among companies facing more governance rules, as indicated by being listed on a foreign stock exchange. This figure depicts average predicted values generated from Model 5 of Table 3. The lines represent the average predicted values generated by each observation's actual values, except *environmental damage* is estimated at each labeled value. The dashed line depicts averages of these predicted values for the subsample of observations in which firms were listed on a foreign exchange. The solid line depicts estimates for the opposite subsample of observations in which firms were not listed on a foreign exchange.

Table 4 Regression Results Predicting Absolute and Weighted Disclosure Ratios

		(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
		Model 1 decomposition		Model 2 decomposition		Model 3 decomposition		Model 4 decomposition		Model 5 decomposition	
Dependent variable:		Absolute disclosure ratio	Weighted disclosure ratio	Absolute disclosure ratio	Weighted disclosure ratio	Absolute disclosure ratio	Weighted disclosure ratio	Absolute disclosure ratio	Weighted disclosure ratio	Absolute disclosure ratio	Weighted disclosure ratio
H1	Environmental damage§¤	0.016**	0.108**	0.016**	0.110**	0.016**	0.110**	0.016**	0.110**	0.009	0.080**
		[0.005]	[0.012]	[0.005]	[0.013]	[0.005]	[0.012]	[0.005]	[0.011]	[0.007]	[0.015]
H2	Environmental NGOs per million population§¤ × Environmental damage§¤			0.001	0.023**						
				[0.002]	[0.005]						
	Environmental NGOs per million population§¤	0.004	−0.002	0.004	0.001	0.004	−0.000	0.004	−0.000	0.004	−0.002
		[0.005]	[0.019]	[0.005]	[0.019]	[0.005]	[0.019]	[0.005]	[0.018]	[0.005]	[0.018]
H3	Civil liberties and political rights§¤ × Environmental damage§¤					0.001	0.013**				
						[0.002]	[0.004]				
	Civil liberties and political rights§¤	0.007	0.004	0.007	0.002	0.007	0.001	0.007	0.002	0.007	0.004
		[0.006]	[0.020]	[0.006]	[0.019]	[0.006]	[0.020]	[0.006]	[0.019]	[0.006]	[0.019]
H4	Globalization index§¤ × Environmental damage§¤							0.003	0.021**		
								[0.002]	[0.008]		
	Globalization index§¤	0.015+	0.125**	0.014+	0.121**	0.015+	0.122**	0.014+	0.120**	0.014+	0.119**
		[0.008]	[0.019]	[0.008]	[0.019]	[0.008]	[0.019]	[0.008]	[0.019]	[0.008]	[0.019]
H5	Listed on a foreign stock exchange × Environmental damage§¤									0.010*	0.037**
										[0.004]	[0.012]
	Listed on a foreign stock exchange	0.013**	0.040**	0.013**	0.039**	0.013**	0.039**	0.012**	0.039**	0.014**	0.047**
		[0.003]	[0.007]	[0.003]	[0.007]	[0.003]	[0.007]	[0.003]	[0.007]	[0.005]	[0.010]
Firm-level controls	Percentage of sales to foreign countries§¤	0.001	0.006*	0.001	0.005+	0.001	0.006*	0.001	0.005+	0.001	0.006+
		[0.001]	[0.003]	[0.001]	[0.003]	[0.001]	[0.003]	[0.001]	[0.003]	[0.002]	[0.003]
	Sales§¤	0.017**	0.027+	0.016**	0.025+	0.017**	0.026+	0.016**	0.026+	0.017**	0.028+
		[0.005]	[0.015]	[0.005]	[0.014]	[0.005]	[0.015]	[0.005]	[0.015]	[0.005]	[0.015]
	High reputation	0.005	0.019	0.005	0.021+	0.005	0.019	0.005	0.019	0.005	0.018
		[0.006]	[0.013]	[0.006]	[0.013]	[0.006]	[0.013]	[0.006]	[0.013]	[0.005]	[0.012]
	Return on assets	0.004	0.007	0.003	0.005	0.003	0.006	0.003	0.005	0.003	0.006
		[0.004]	[0.008]	[0.004]	[0.008]	[0.004]	[0.008]	[0.004]	[0.008]	[0.004]	[0.008]
	Capital intensity	0.040**	0.093**	0.040**	0.093**	0.040**	0.093**	0.040**	0.091**	0.040**	0.091**
		[0.011]	[0.020]	[0.011]	[0.020]	[0.011]	[0.020]	[0.011]	[0.020]	[0.011]	[0.019]
	Employment†	0.007**	0.011*	0.007**	0.011*	0.007**	0.011*	0.007**	0.011*	0.006**	0.011*
		[0.002]	[0.005]	[0.002]	[0.005]	[0.002]	[0.005]	[0.002]	[0.005]	[0.002]	[0.005]

Table 4 (Continued)

		(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
		Model 1 decomposition		Model 2 decomposition		Model 3 decomposition		Model 4 decomposition		Model 5 decomposition	
Dependent variable:		Absolute disclosure ratio	Weighted disclosure ratio	Absolute disclosure ratio	Weighted disclosure ratio	Absolute disclosure ratio	Weighted disclosure ratio	Absolute disclosure ratio	Weighted disclosure ratio	Absolute disclosure ratio	Weighted disclosure ratio
Country-level controls	Intergovernmental environmental organizations	0.022^{**} [0.006]	0.053^{**} [0.013]	0.022^{**} [0.006]	0.054^{**} [0.013]	0.022^{**} [0.006]	0.054^{**} [0.013]	0.022^{**} [0.006]	0.054^{**} [0.013]	0.021^{**} [0.006]	0.051^{**} [0.013]
	Press freedom	−0.022 [0.024]	0.041 [0.068]	−0.022 [0.024]	0.033 [0.065]	−0.023 [0.024]	0.034 [0.069]	−0.022 [0.023]	0.045 [0.061]	−0.020 [0.024]	0.049 [0.066]
	Corruption	−0.003 [0.004]	−0.016 [0.012]	−0.003 [0.004]	−0.017 [0.012]	−0.003 [0.004]	−0.016 [0.012]	−0.003 [0.004]	−0.016 [0.012]	−0.003 [0.004]	−0.017 [0.012]
	Per capita gross domestic product	-0.010^{+} [0.006]	-0.080^{**} [0.013]	-0.010^{+} [0.006]	-0.078^{**} [0.013]	-0.010^{+} [0.006]	-0.077^{**} [0.013]	-0.010^{+} [0.006]	-0.078^{**} [0.013]	-0.010^{+} [0.006]	-0.080^{**} [0.013]
	Accounting standards stringency	−0.059 [0.047]	−0.111 [0.155]	−0.060 [0.047]	−0.124 [0.153]	−0.060 [0.047]	−0.118 [0.157]	−0.060 [0.047]	−0.115 [0.155]	−0.062 [0.047]	−0.124 [0.154]
	Kyoto Protocol ratified	0.004 [0.004]	0.002 [0.013]	0.004 [0.004]	0.002 [0.012]	0.005 [0.004]	0.003 [0.012]	0.004 [0.004]	0.001 [0.012]	0.004 [0.004]	0.002 [0.012]
	Kyoto Protocol bound	0.017^{*} [0.008]	0.024^{+} [0.013]	0.017^{*} [0.008]	0.024^{+} [0.013]	0.017^{*} [0.008]	0.023^{+} [0.013]	0.017^{*} [0.008]	0.025^{+} [0.013]	0.018^{*} [0.008]	0.025^{+} [0.013]
	Environmental stress	0.023 [0.029]	−0.001 [0.067]	0.023 [0.028]	−0.001 [0.069]	0.023 [0.028]	−0.001 [0.067]	0.023 [0.029]	0.003 [0.067]	0.023 [0.029]	−0.001 [0.066]
	Year dummies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
	Industry dummies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included

Notes. Regression coefficients of a hierarchical linear model with firms nested within headquarters countries. Brackets contain standard errors clustered by country; $^{**}p < 0.01$; $^{*}p < 0.05$; $^{+}p < 0.10$. For all models, $N = 15{,}037$ firm-year observations pertaining to 4,750 firms headquartered in 45 countries. §Denotes winsorized (top-coded) at the 95th percentile. $^{\circ}$Denotes standardized variables. †Denotes standardized by country. All models also include dummy variables denoting instances where missing values of the following variables were recoded to 0: the country's *globalization index*, *civil liberties and political rights*, *environmental NGOs per million population*, *intergovernmental environmental organizations, accounting standards stringency*, and *environmental stress* and the organization's *percentage of sales to foreign countries* and *employment*.

Similarly, whereas both Models 5a and 5b yield statistically significant positive coefficients on the interaction of *environmental damage* and *listed on a foreign stock exchange*, comparing the coefficient sizes indicates that the incremental effect of environmental damage on foreign-listed firms' weighted disclosure is nearly four times the magnitude on absolute disclosure. In other words, institutional scrutiny and information diffusion mechanisms appear to lead more environmentally damaging firms to report more of what matters most: those environmental indicators that more comprehensively communicate the environmental harm their operations impose.

Discussion and Conclusion

Our study examined a set of organizational and institutional factors that affect both scrutiny of and normative pressures on firms and thus the extent to which they engage in the symbolic strategy of selective disclosure. Despite prior research that suggests the opposite may be true, our analysis of the symbolic environmental transparency practices of thousands of public firms headquartered across 45 countries revealed that those posing more environmental damage were particularly likely to eschew selective disclosure. Building on prior research indicating that poor environmental performance makes firms more visible to stakeholders with environmental concerns, our theory focuses on how this characteristic exposes firms to greater scrutiny, which leads them to engage less in selective disclosure. Our interaction results further support our proposition that scrutiny and norms drive this relationship. Specifically, we hypothesized and found that civil society's activism and information access had especially pronounced inhibiting effects on the selective disclosure exhibited by more environmentally damaging firms. We also hypothesized and found less selective disclosure by firms subjected to information disclosure norms through their greater exposure to foreign investors. Our empirical extension, which examined the two components of our selective disclosure measure—absolute disclosure level and weighted disclosure level—provides further evidence for our hypothesized mechanism. Across the different hypothesized relationships we examine, weighted disclosure levels typically increase at a greater rate than absolute disclosure, suggesting that as more damaging firms are exposed to scrutiny and global norms, they choose to disclose more substantive information.

Institutional Influences and Corporate Strategies

Our theory and findings promote a deeper understanding of the multilevel factors that have an institutional influence on firms' symbolic strategies. Whereas prior research has offered conflicting views as to whether firm characteristics—such as environmental performance—that lead to greater visibility are associated with more or less institutional compliance (Greenwood et al. 2011), our investigation sought to theorize specific mechanisms associated with compliance and to develop multilevel tests to better identify these mechanisms. Our investigation of the effects of global norms and of different types of scrutiny on selective disclosure examined not only firm characteristics likely to be associated with these mechanisms, but also the institutional environments that lead to greater scrutiny of and normative pressure on firms. By examining these relationships at different levels of analysis and by exploring the interactions between them, we can be more confident than prior researchers were that our theorized processes—scrutiny and global norms—lead firms to temper their selective disclosure.

Our multilevel investigation also enables us to theoretically and empirically distinguish distinct mechanisms of scrutiny and of norm diffusion, which have seldom been differentiated. For instance, prior research examining country-level institutional environments has stressed the importance of each of these mechanisms but typically measured their aggregate effect via the presence of international nongovernmental organizations (INGO) or intergovernmental organization (IGO) (Tsutsui and Wotipka 2004). In contrast, our study distinguished scrutiny and normative mechanisms both theoretically and empirically. Furthermore, research examining scrutiny mechanisms has typically been conducted only in the U.S. context, where the robustness of civil society is taken for granted (Kim and Lyon 2011, 2015). By contrast, we specify two key sources of scrutiny: environmental NGO presence, which is a form of organized scrutiny (King 2008), and civil liberties and political rights, which represent more generally the potential for public voice. Regarding norm diffusion mechanisms, we also hypothesized and tested several factors that convey transparency norms that lead firms to temper selective disclosure. These factors are (a) civil society's exposure to global information in the headquarters country and (b) a firm's direct exposure to strong transparency norms through its foreign stock exchange listing. Identifying and testing sources of scrutiny and norm diffusion mechanisms are important for understanding greenwashing in the global context across different types of political and economic systems. Furthermore, compared to the economic models of prior researchers (Lyon and Maxwell 2011), our work provides valuable empirical findings and illustrates how the real social process unfolds. In conclusion, by emphasizing several simultaneous mechanisms and processes that temper selective disclosure, our approach contributes to the institutional literature by providing a more nuanced distinction between the different institutional pressures that affect firms' symbolic activities.

Contributions to Research on Information Disclosure

In addition to contributing to the understanding of selective disclosure as a symbolic strategy, our research advances the broader research on information disclosure. This growing literature has examined the circumstances under which companies voluntarily disclose environmental information and the need for standards and third-party verification to guide companies on what indicators and issues they should report (e.g., Kolk 2004, Reid and Toffel 2009, Lewis et al. 2014). Our paper adds an important dimension to this literature by revealing the extent to which reported information is or is not likely to be representative of a company's true environmental impact. Significantly, our measurement of selective disclosure, which is a comparison of a firm's symbolic transparency with its substantive transparency, goes beyond prior literature that is focused on one or the other (e.g., Kolk 2004, Marquis and Qian 2014, Short and Toffel 2008). Thus, we provide a novel approach to understanding this form of organizational symbolic activity. Furthermore, our conceptualization of selective disclosure as a general corporate process distinguishes our study from corporate environmentalism studies that focus mainly on disclosure of environmental indicators. As a result, our theory is more generalizable for understanding other organizational disclosure processes (Pfeffer 1981, Abrahamson and Park 1994). Thus, we shift the conversation to a deeper understanding of companies' voluntary business strategies and encourage future research along these lines to further unpack disclosure practices and, more broadly, misleading communication.

Implications for Practice

The extent to which corporations accurately disclose their social and environmental performance has important practical implications for many market and nonmarket stakeholders—ranging from corporate customers to investors to NGOs and intergovernmental agencies such as the United Nations—that rely on corporate environmental reporting and transparency to assess environmental performance. Our work reveals to these stakeholders a constellation of organizational characteristics and institutional features that predict when the disclosed information is more likely to be symbolic or to be substantive.

These stakeholders and practitioners can put our results to use in several ways. In circumstances where disclosed information tends to be more symbolic, customers seeking information about their existing and potential suppliers and asset managers seeking information about companies in which they are considering investing can bolster the accuracy of such information by requiring independent third-party validation. The failure to provide third-party-validated information in such circumstances would signal that a firm's disclosures were more likely to be symbolic. Whereas scholars have described the general merits of third-party validation of corporate environmental and social reports (Dando and Swift 2003), our work is, to our knowledge, among the first to identify circumstances under which deploying this practice would add the most value.

Understanding key levers that can promote more substantive disclosure is also important for domestic and international actors such as activists and NGOs. By better understanding which corporate environmental reports are more likely to be symbolic, programs that guide and encourage environmental disclosure—such as the Global Reporting Initiative and the United Nations Global Compact—can impose cost-effective requirements to preserve their own integrity. For example, they could impose strong validation requirements but exempt companies that list their shares on exchanges with strong transparency requirements or that are headquartered in countries more connected to global civil society. For social movement organizations, our environmental performance and foreign exposure findings suggest that certain corporations, and corporations in certain countries, may be more responsive targets for institutional pressure.

Boundaries and Limitations

Many of our study's limitations stem from its global context. Given the difficulty of collecting reliable and consistent firm-level variables for over 4,500 firms across 45 countries, some of our measures are more coarse than they would likely be if we were examining a smaller set of firms headquartered in a single country. For example, we would have liked to be able to collect data on the value of each firm's sales to each country to examine whether characteristics of its international customers might affect selective disclosure, but we were unable to locate such data for our broad international sample of firms. We encourage future research to explore whether such additional variables affect symbolic disclosure.

Whereas relying on archival data provides many advantages, one disadvantage is that we cannot observe the motivations that underlie firms' environmental reporting practices. Whereas our measure of selective disclosure identifies the extent to which firms disproportionately disclose their less-damaging environmental impacts, we acknowledge that this activity might sometimes be inadvertent—a result of limited management attention. Still, the scrutiny and normative pressures we describe ought to heighten that attention. If some selective disclosure is indeed inadvertent, our estimates might underestimate the true hypothesized effects. Further research based on qualitative methods or on survey data is needed to distinguish the motives underlying firms' symbolic practices.

We also acknowledge the limitation of focusing on the institutional features only of firms' headquarters countries. Whereas this is consistent with much of the literature that explores institutional influences on multinational corporations' decision making, we acknowledge that the institutional features of other contexts—such as the countries to which firms sell the most—might also be influential. We encourage future research to identify the types of managerial decision that are influenced by firms' various institutional contexts.

Finally, although our theory is empirically supported in our sample of large public firms, data limitations prevented us from including private firms in our analyses. Because private firms are less visible, we speculate that they may be less likely to follow our predictions. We acknowledge this limitation and encourage future research to examine if type of ownership is a boundary condition for our theory.

Conclusion

This study examines the extent to which characteristics that enhance scrutiny and increase exposure to international norms influence the practice of selective disclosure for thousands of corporations across the institutional environments of 45 nations. Our findings (a) suggest that the global environmental movement affects corporate environmental management practices and (b) highlight several levers available to corporate customers, investors, activists, and policy makers to improve firms' environmental performance. We theorized how selective disclosure can be influenced both by scrutiny and by diffusion of global norms and how these processes operate through particular characteristics of organizations and their institutional environments. In doing so, our approach highlights the importance of considering multiple levels with large-scale organizational data to examine how institutional processes operate.

Supplemental Material

Supplemental material to this paper is available at http://dx.doi.org/10.1287/orsc.2015.1039.

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Endnotes

[1]For several years, *Newsweek* magazine's Green Rankings relied on Trucost data to assess companies' environmental impacts.

[2]The four-year window of our sample (2004–2007) was the entire time period available when we bought the data in 2009. Trucost provided four years of data from 2,811 firms, three years from 655 firms, two years from 578 firms, and a single year from 743 firms.

[3]We had fewer than five observations for firms headquartered in Argentina, the British Virgin Islands, the Czech Republic, Kuwait, Morocco, Puerto Rico, Slovenia, the United Arab Emirates, and Zimbabwe. None of the companies headquartered in the Cayman Islands, Egypt, Iceland, or Sri Lanka had any disclosures.

[4]Nearly half the observations are of firms headquartered in five countries of Anglo-American heritage: Australia, Canada, New Zealand, the United Kingdom, and the United States. As a robustness test of whether our results were driven by firms headquartered in these countries, we re-estimated our primary models on a subsample that excluded them. The results continued to yield statistically significant coefficients on our hypothesized variables of the same sign as our primary results, providing evidence that the hypothesized relationships operate well beyond those five countries.

[5]This formula results in *selective disclosure magnitude* equaling 0 when a firm's *absolute disclosure ratio* equals its *weighted disclosure ratio*, which occurs when a firm discloses no indicators (when both ratios equal 0), all of its indicators (when both ratios equal 1), or when the ratios take on identical intermediate values. Each of these scenarios represents the lack of misrepresentation. We also estimated our models on an alternative outcome variable, a dichotomous variable indicating any evidence of selective disclosure. *Any selective disclosure* was coded 0 if there was no evidence of selective disclosure (that is, *selective disclosure magnitude* was less than or equal to zero) and was coded 1 if there was evidence of selective disclosure (that is, *selective disclosure magnitude* was positive). These models, estimated with logistic regression, continued to yield statistically significant coefficients on all of our hypothesized variables except that the coefficient on *listed on a foreign stock exchange x environmental damage* continued to be negative but was no longer statistically significant.

[6]Disclosures in our context refer only to companies publicly reporting their firm-wide global emissions of particular substances in a given year. Reporting such global metrics is "almost exclusively voluntary" (Salo 2012, p. 173), which mitigates concerns that our results might be contaminated by differences in regulatory reporting requirements, a much greater issue for plant-level analyses because some regulatory regimes require plants to report their annual emissions.

[7]This data-driven approach differs substantially from that of most environmental, social, and governance rating agencies, which instead tend to focus on a subset of indicators that reflect the agency's cultural norms, ideological preferences, and competitive position vis-à-vis other rating agencies.

[8]Suppose Companies A and B are otherwise identical, but Company A discloses only the 10 least damaging indicators out of 20 and Company B discloses only the 10 most damaging out of 20. They will have the same *absolute disclosure ratio* because they have disclosed the same amount of information, but Company B's *weighted disclosure ratio* will be higher than that of Company A, because Company B has disclosed more important information.

[9]For example, a steel manufacturer or cement producer that discloses only its greenhouse gas emissions—the dominant environmental impact in those highly energy-intensive industries—is likely to have a low *absolute disclosure ratio* but a high *weighted disclosure ratio*, resulting in a low *selective disclosure magnitude*. It is keeping a lot undisclosed but is disclosing the most damaging indicator. In contrast, a mining company that discloses most of its pollution released into the air, water, and land but omits some or all of the most environmentally burdensome pollutants in that industry (such as ammonia, arsenic, and cyanide) will have a high *absolute disclosure ratio* but a lower *weighted disclosure ratio*, resulting in a high *selective disclosure magnitude*. It is disclosing many indicators but keeping the most important ones undisclosed.

[10]A brief example is illustrative. Consider a railroad company whose activities, according to Trucost's sophisticated model, resulted in 27 pollutants. Suppose Trucost researchers determined that the company publicly disclosed worldwide quantitative figures for 22 of these 27 indicators. The company's *absolute disclosure ratio* will be 0.81 (calculated as 22/27), a high value that suggests a great deal of environmental transparency. Suppose further that Trucost's model determined that the environmental damage associated with these 22 indicators constitutes just 51% of the company's overall environmental damage (that is, the company's *weighted disclosure ratio* is 0.51) and that the remaining 49% derives from the five relevant indicators the company failed to disclose, which could be ammonia, nitrous oxide, HFCs, methane, and total VOCs. The company's *selective disclosure magnitude* is 0.3, calculated as *absolute disclosure ratio* minus *weighted disclosure ratio* (that is, $0.81 - 0.51$). This positive value indicates that the company selectively disclosed in a manner that risks exaggerating its environmental transparency because its disclosures focused on its relatively benign environmental impacts.

[11]In other words, they represent the externalized costs of the environmental degradation associated with each ton of natural resource consumed and pollutant emitted. For example, Trucost uses $31 as the environmental impact per ton of greenhouse gas emitted (Trucost Plc. 2008, p. 5).

[12]We also attempted to develop measures in other relevant institutional environments, such as the countries each company was mostly reliant upon for sales, but were thwarted by data unavailability. Therefore, we leave this to future research in contexts where such measures exist.

[13]Freedom House, "Freedom in the world," http://www.freedomhouse.org/report-types/freedom-world (accessed March 12, 2010).

[14]Using the *civil liberties* score instead of the combined *civil liberties and political rights* score yielded nearly identical results. The two measures are very highly correlated.

[15]Firm headquarter countries' regulatory environments might differentially affect selective disclosure by firms in different industries, particularly if the strength of civil society correlates with regulatory requirements mandating some disclosure by firms in more environmentally damaging industries. To assess whether our results are robust to this possibility, we estimated a model akin to Model 3 in Table 3 (which interacts *civil liberties and political rights* with *environmental damage*) that also included as additional controls interactions between two-digit industry dummies and headquarter country dummies. This alternative model yielded coefficients on our hypothesized variables that are nearly identical in magnitude and significance to those of our primary model, suggesting that our primary results are robust to this concern.

[16]ETH Zürich, "KOF Index of Globalization," Swiss Federal Institute of Technology Zurich website, http://globalization.kof.ethz.ch/ (accessed March 2010).

[17]Examples include country-specific lists, such as *Fortune* magazine's U.S.-oriented "100 Best Companies to Work For" and Interbrand's "Best Chinese Brands," and global lists such as *Business Week*'s "Top Innovative Companies in the World."

[18]World Economic Forum, Yale Center for Environmental Law and Policy, and Columbia University Center for International Earth Science Information Network, "2001 Environmental Sustainability Index (ESI)," p. 244, http://sedac.ciesin.columbia.edu/data/set/esi-environmental-sustainability-index-2001 (accessed March 10, 2010).

[19]This index reflects (a) the freedom that journalists and the news media actually possess and (b) government efforts to respect that freedom, based on surveys on harms and threats to individual journalists (such as murders, imprisonment, and physical attacks) and to the news media (such as censorship and harassment). Potential concerns about high correlation between *press freedom* and *civil liberties and political rights* led us to conduct a robustness test whereby we estimated our models without controlling for *press freedom*. These alternative models yielded results nearly identical to those of our primary models.

[20]Transparency International, "A short methodological note: Transparency International Corruption Perceptions Index (CPI) 2008," http://www.transparency.org/policy_research/surveys_indices/cpi/2008; data at http://www.transparency.org (both accessed March 12, 2010).

[21]U.S. Department of Agriculture Economic Research Service, "Real GDP (2005 dollars) historical data set," available at http://www.ers.usda.gov/Data/Macroeconomics/#HistoricalMacroTables (accessed March 12, 2010).

[22]To account for the possibility that a country's progress toward meeting its Kyoto Protocol target might influence selective disclosure practices, we conducted robustness tests in which we re-estimated our models by also controlling either for *Kyoto progress* or for *Ahead of Kyoto*, which yielded results nearly identical to those of our primary model. We created *Kyoto progress* as a country-level variable calculated as the difference between a Kyoto "Annex I" country's actual emissions reduction rate as of 2008 and the average annual reduction rate required to meet its Kyoto target, coded with that value for all years since the protocol entered into force, and coded 0 otherwise. Among the countries in our sample, this ranged from Spain exhibiting the largest shortfall (−21.8%) to Norway exhibiting the largest surplus beyond its target (17.6%). We created *Ahead of Kyoto* as a dichotomous variable, coded 1 if the country was ahead of its target in the years after it was bound by its Kyoto commitment, and 0 otherwise. We obtained data for these two variables from European Environment Agency (2010).

[23]United Nations Framework Convention on Climate Change, "Kyoto Protocol status of ratification," http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php (accessed July 2009).

[24]World Economic Forum, Yale Center for Environmental Law and Policy, and Columbia University Center for International Earth Science Information Network, "2002 Environmental Sustainability Index (ESI)," http://sedac.ciesin.columbia.edu/

data/set/esi-environmental-sustainability-index-2002 (accessed March 10, 2010).

[25]Correlations are reported in Table 2.

[26]*Environmental NGOs per million population* was missing for the 924 observations pertaining to Bermuda, Hong Kong, Indonesia, and Taiwan; *civil liberties and political rights* for 808 observations (Bermuda, Hong Kong, South Korea); *globalization index* for 845 (Bermuda, Hong Kong, Taiwan); *intergovernmental environmental organizations* for 929 (Bermuda, Hong Kong, Luxembourg, Russia, Taiwan); *press freedom* for 122 (Bermuda, Luxembourg); *per capita gross domestic product* for 74 (South Africa); *accounting standards stringency* for 652 (Bermuda, China, Hungary, Indonesia, Ireland, Luxembourg, Pakistan, Poland, Russia); and *environmental stress* for 1,052 (Bermuda, Hong Kong, Luxembourg, Singapore, Taiwan).

[27]Mixed-effects models are particularly appropriate for analyzing data that contain some variables whose unit of analysis is nested within a more aggregated unit of analysis of other variables; for example, when firm-level attributes are nested within headquarter-country-level attributes (Rabe-Hesketh and Skrondal 2012, Bridwell-Mitchell and Lant 2014, Majumdar and Bhattacharjee 2014).

[28]Lyon and Maxwell's (2011) model predicts that the best and worst environmental performers would greenwash less than moderate performers. We estimated an exploratory model that allowed for the possibility of a nonmonotonic relationship by adding *environmental damage squared* to our direct model. The results of this exploratory model continued to yield a negative significant coefficient on *environmental damage* ($b = -0.042$; $p < 0.01$) and also yielded a negative significant coefficient on *environmental damage squared* ($b = -0.041$; $p < 0.01$). The results of this exploratory model and our primary model both indicate that less selective disclosure is exhibited by more environmentally damaging firms, which differs from the prediction of the Lyon and Maxwell (2011) model. The nuance revealed by the exploratory model is that the decline in selective disclosure occurs at an accelerating pace as environmental damage increases.

[29]This relationship is depicted in Figure 1, which graphs average predicted values of *selective disclosure magnitude* from Model 2 estimated at varying levels of *environmental performance*.

[30]Figure 2 graphs average predicted values from Model 3.

[31]Figure 3 graphs average predicted values from Model 4.

[32]Figure 4 graphs average predicted values from Model 5.

[33]Specifically, these results indicate that a one-standard-deviation increase in environmental damage is associated with a 35% increase in *absolute disclosure ratio* and a 72% increase in *weighted disclosure ratio*. The 35% increase is calculated by dividing the 0.016 coefficient on *environmental damage* in Model 1a by 0.046, the sample average of *absolute disclosure ratio*, that model's dependent variable. Similarly, the 72% increase is calculated by dividing the 0.108 coefficient on *environmental damage* in Model 1b by 0.149, the sample average of *weighted disclosure ratio*, that model's dependent variable.

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