Making the Grade: An Analysis of Sustainability Reporting Standards and GRI Adherence Ratings

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Abstract

The purpose of this study is to determine how institutional factors affect the implementation of sustainability standards. We draw on institutional theory and the cross-disciplinary literature on sustainability standards and sustainability reporting to empirically test seven hypotheses regarding Global Reporting Initiative (GRI) adherence ratings. The sample for the study consists of 4,380 organizations that adopted GRI's sustainability standards and sustainability reporting framework for the period 2005 to 2015, resulting in a total of 13,194 organization-year observations. The results of a generalized estimating equation (GEE) model with a Gaussian distribution, identity link function, and unstructured correlation matrix support six of the seven hypotheses. In short, institutional norms and the pressure to achieve organizational legitimacy result in relatively high adherence ratings for state-owned enterprises and public institutions, Asian organizations, European organizations, large organizations, organizations that provide external assurance, and publicly traded companies. We also find that experience in sustainability reporting is positively related to adherence ratings, which is suggestive of organizational learning. Implications for sustainability research and public policy are discussed.

Keywords: sustainability, sustainability standard, sustainability report, generalized estimating equation (GEE), Global Reporting Initiative (GRI)

1. Introduction

Standards help organizations develop and achieve performance goals. Organizations that rely on standards for innovation, product quality, and product safety are more likely to meet performance objectives than organizations that do not (Dranove and Jin, 2010; Foucart and Li, 2021; Gruber, 2000). An emerging consensus among business leaders, regulators, policy makers, and academics is that standards provide important guidance and direction during the development and implementation of organizational strategies (Garud, Tuertscher, and Van De Ven, 2013). Therefore, it is not surprising that many organizations are adopting sustainability standards to guide environmental and social performance in addition to financial performance (Perez-Cornejo, Quevedo-Puente, and Delgado-Garcia, 2019). As more organizations take the triple bottom line approach to measuring organizational performance, sustainability standards have become prominent in sustainability reporting and other forms of voluntary non-financial disclosures (Skouloudis, Evangelinos, and Kourmousis, 2009; Torelli, Balluchi, and Furlotti, 2020).

Sustainability standards associated with the Global Reporting Initiative (GRI), the United Nations (UN) Global Compact, the The Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises, and similar frameworks are designed to "stimulate, guide, and help organizations account for socially and environmentally desirable behavior" (Christensen, Morsing, and Thyssen 2017, p. 239). These standards provide organizations with a means of understanding their impacts on the economy, the environment, and society. Moreover, standards create a systematic way for organizations to communicate their impacts to interested stakeholders, most commonly through the publication of sustainability reports. The purpose of sustainability reporting is to increase accountability and transparency

with respect to organizations' environmental, social, and governance (ESG) activities (Nikolaeva and Bicho, 2011).

Despite the laudable intent of sustainability reporting, many stakeholders are dissatisfied with the current state of ESG disclosures (Kim and Lyon, 2015). For example, recent complaints from environmental watchdog groups, academics, and institutional investors have pushed the United States Securities and Exchange Commission (SEC) to examine several organizations for promoting false or misleading claims about the impacts of their ESG activities (Michaels, 2021). Mounting concerns about greenwashing may cause potential customers, investors, and other stakeholders to discredit the information in sustainability reports (Yu, Van Luu, and Chen, 2020). In response, the institutions that create sustainability reporting frameworks (e.g., GRI) often provide ratings or grades based on level of adherence to the sustainability standards outlined in the report. The adherence ratings provide a way to assess compliance with the standards (Vigneau, Humphreys, and Moon, 2015). High ratings suggest that an organization is disclosing information about all ESG performance indicators, and low ratings suggest that the organization is not meeting all standards. The large amount of variance in adherence ratings indicates that some organizations have successfully implemented ESG programs that meet or exceed sustainability standards, whereas other organizations are egregiously failing to meet the basic sustainability standards outlined in the reporting framework.

The adoption of sustainability standards represents an important step in the development of an organization's sustainability strategy, yet organizations often fail to meet their sustainability goals (Galpin, Whittington, and Bell, 2015; Lloret, 2016). Why do organizations fail to meet the sustainability standards that they voluntarily adopted? Prior research suggests that financial and human resources, organizational culture, and stakeholder pressure partially

explain implementation success (Aerts, Cormier, and Magnan, 2006; Cormier and Magnan, 2003; Thorne, Mahoney, and Manetti, 2014). In this paper, we argue that the institutional environment also affects outcomes associated with sustainability standardization.

The purpose of this study is to identify factors in the institutional environment that contribute to the successful (or unsuccessful) implementation of sustainability standards. We develop and test seven hypotheses rooted in institutional theory (Meyer and Rowan, 1977; Powell and DiMaggio, 1991) and the relevant literature on sustainability standards and sustainability reporting. The sample for the study consists of 4,380 organizations that adopted GRI's sustainability standards and the corresponding GRI reporting framework for the period 2005 to 2015, resulting in a total of 13,194 organization-year observations. The results of a generalized estimating equation (GEE) model suggest that several factors in an organization's institutional environment are predictive of the sustainability report's adherence rating. We demonstrate how institutional norms and the pressure to achieve organizational legitimacy result in relatively high ratings for state-owned enterprises, Asian organizations, European organizations, large organizations, publicly traded organizations, and organizations that use accounting firms, engineering firms, or consultancies to audit their reports. In addition, we find that experience in sustainability reporting is positively related to adherence ratings, as it appears to have a cumulative effect.

This study has multiple implications for researchers and policy makers. First, we answer calls for more research on sustainability standards (Stilgoe, Owen, and Macnaghten, 2013; Wagner, 2020). Second, we add to the emerging literature on sustainability standards by shedding light on institutional factors that impact the implementation of sustainability strategies and reporting. In addition to providing a theoretical lens for the variance in adherence ratings, we

demonstrate how political and financial institutions (particularly the OECD and stock exchanges) help promote transparency of organizations' ESG activities. Finally, we identify the types of organizations that are most likely to successfully implement sustainability standards and which types are most likely to fail. Policy makers may use this information to direct resources and support to organizations that have historically struggled to meet their ESG goals.

The rest of the study is organized as follows. First, we review the literature on sustainability standards and sustainability reporting. Second, we elaborate on our theoretical framework, which is grounded in institutional theory (Meyer and Rowan, 1977; Powell and DiMaggio, 1991). Third, we develop several hypotheses based on institutional theory and cross-disciplinary research on sustainability standards. Fourth, we describe the research design, including sampling, data collection procedures, measurement of variables, and the GEE model. The results section follows. Finally, we discuss the study's implications for theory and policy and conclude with a paragraph that addresses the study's limitations.

2. Theoretical background and hypotheses

2.1. Sustainability standards and sustainability reporting

Sustainability standards are "voluntary predefined norms and procedures for organizational behavior with regard to social and/or environmental issues" (Rasche, 2010, p. 280). There are a variety of sustainability standards available to organizations, such as the GRI Standards, the UN Global Compact Principles, the UN Sustainable Development Goals, the OECD Guidelines for Multinational Enterprises, ISO 26000, and IFC Performance Standards. Some organizations use more than one set of standards when developing their sustainability strategies. Although the specifics vary depending on the standard-setting organizations, they are all designed to address questions related to the ESG performance of organizations (Vigneau et

al., 2015). The GRI standards are currently the most widely used voluntary sustainability standards worldwide (Levy, Brown, and De Jong, 2010; Nikolaeva and Bicho, 2011). Because these standards have gained widespread acceptance and legitimacy from corporations as well as governments and international organizations, they form the basis of this study. GRI's environmental standards require disclosures of energy use, water use, and carbon emissions. The GRI social standards include, but are not limited to, information about the types and rates of employee injuries, occupational diseases, work-related fatalities, average hours of training per employee, number of incidents of discrimination, and community impact assessments. The governance standards require disclosures of retirement plan obligations, financial assistance from government entities, proportion of senior management hired from local communities, and country-by-country tax information.

Part of GRI's popularity stems from the fact that its standards are designed to be used in sustainability reports. Sustainability reporting, which is also called corporate social responsibility (CSR) reporting when applied to businesses, is becoming an increasingly common practice across the world, and the majority of organizations that publish sustainability reports rely on GRI's reporting framework (Threlfall, King, Shulman, and Bartels, 2020). GRI provides guidance about what to report (i.e., performance indicators) and how to report (i.e., reporting protocols). Under the G1-G3.1 reporting guidelines, organizations first report on internal characteristics (e.g., organization size, country of headquarters), then management approach (e.g., policies, commitments, goals/targets, resources), and finally ESG performance indicators. GRI then grades the report based on its level of adherence, or compliance, with the GRI Standards. The grades, which range from C to A^+, assess compliance with the GRI Standards (Vigneau et al., 2015). As such, the levels of compliance with GRI standards explore the level

and depth of adherence. The GRI Standards allow an organization to report information in a way that covers all its most significant impacts on the economy, environment, and people, or to focus only on specific topics, such as climate change or child labor. The more the firm discloses, the higher its adherence score is likely to be, and therefore, it would be incentivized to do so in its GRI reporting. Thus a lower rating captures both how much the company has disclosed, as well as the level of adherence of the disclosed information. As such, the rating captures an average adherence across the reported standards, as well as the level of reporting (i.e. how many standards the firm reported on). GRI has detractors, and one unintended consequence of the GRI framework is that managers might focus more on how ESG information is reported than actual ESG outcomes for stakeholders (Vigneau et al., 2015). However, GRI is clearly the dominant paradigm for sustainability reporting, and prior research shows that GRI-sanctioned reports accomplish the intended purposes of increasing transparency and reducing information asymmetry between the organization's managers and external stakeholders (Rhodes, 2010).

2.2. Institutional theory

Institutional theory offers a non-economic explanation of organizational behaviors (Meyer and Rowan, 1977; Powell and DiMaggio, 1991). The theory asserts that the institutional environment has a profound impact on organizational behaviors and strategies (Scott 2008). The institutional environment contains both formal and informal institutions that dictate the "rules" of economic activity (North, 1990, p. 3). Organizations are embedded in a larger system that is governed by moral, social, and cultural norms. Norms are "procedures that actors employ flexibly and reflexively to assure themselves and those around them that their behavior is reasonable" (DiMaggio and Powell, 1991, p. 20). Institutional norms originate from a wide variety of sources, including educational institutions, political institutions, public opinion,

professional associations, and accreditation agencies (Scott, 1987). To survive, organizations must adapt to the institutional environment and act in accordance with the sociocultural and industrial norms that define the rules of the game (North, 1990). Institutional norms regarding the concepts of sustainability and corporate social responsibility have changed within the past twenty years, as business leaders, policy makers, and academics now believe that economic growth must account for environmental and social impact if it is to be sustainable (Connelly, Ketchen Jr., and Slater, 2011).

Organizations are judged by how well they enact and uphold institutional norms (Handelman and Arnold, 1999). According to institutional theory, organizations must not only strive for efficiency and effectiveness, but they must also gain legitimacy (Martinez and Dacin, 1999), which has become a central concept in institutional theory. Suchman (1995, p. 574) defines legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions." Organizations earn legitimacy by conforming to institutional norms.

Organizations often seek legitimacy for their sustainability initiatives through sustainability reporting (Nikolaeva and Bicho, 2011; O'Dwyer, Owen, and Unerman, 2011). Reports signal to external stakeholders that the organization adheres to environmental and social norms and expectations (Connelly, Ketchen Jr., and Slater, 2011). GRI plays the role of legitimation agent in the world of sustainability reporting (Brown et al., 2009). Organizations achieve some measure of credibility by submitting their reports to GRI and becoming a member of the GRI community (Brown et al., 2009). However, adherence to GRI's sustainability standards exhibits significant variance, as indicated by the wide range of GRI grades for the reports in the Sustainability Disclosure Database (Global Reporting Initiative, 2021). A major

reason for this variance is that institutional norms regarding sustainability vary based on organization type, industry category, country of operations, and region (Rosati and Faria, 2019). For certain organizations, expectations for sustainability are low, and there is little institutional pressure to conform to standards for sustainable economic development (Nikolaeva and Bicho, 2011; O'Dwyer et al., 2011). Although these organizations publish sustainability reports, the veracity of information contained therein is questionable. These organizations may merely be involved in box ticking ESG metrics as opposed to implementing meaningful ESG programs (Christensen et al., 2017). Such organizations are likely to receive a relatively low adherence grade from GRI. On the other hand, some organizations face immense institutional pressures to comply with sustainability standards (Nikolaeva and Bicho, 2011; O'Dwyer et al., 2011). The latter take reporting more seriously, and they are also more likely to faithfully adhere to the GRI standards. Accordingly, such organizations should receive a relatively high adherence grade from GRI. Because institutional pressures affect the extent to which organizations adhere to institutional norms (DiMaggio and Powell, 1983), we argue that an organization's environment will influence the extent to which it complies with the sustainability standards outlined in a sustainability report. In the next section of this paper, we develop hypotheses for seven institutional factors that are likely to influence organizational compliance with the GRI standards.

2.3. Hypotheses

State-owned enterprises and public institutions face greater pressure to uphold ESG norms than private companies, which include corporations, subsidiaries, and partnerships (Adams, 2002; Greiling, Traxler, and Stotzer, 2015). According to Greiling and colleagues, "state-owned firms are expected to provide more social and environmental disclosures than

private firms because of public contracts legitimating their existence and actions" (2015, p. 406). The missions of state-owned enterprises and public institutions typically align with common environmental and societal interests, and financial performance is not a primary concern. While private organizations may also pursue sustainability goals, they must balance environmental and social activities with business activities that directly affect financial performance. State-owned enterprises often set the sustainability reporting benchmarks for other companies in countries where government actors are encouraging more ESG transparency. Ultimately, external stakeholders expect government entities to be fully transparent in their actions, and thus the general public demands relatively more information from government entities regarding their ESG activities (Nikolaeva and Bicho, 2011). We hypothesize that state-owned enterprises and public institutions will respond to such institutional pressures by strictly following sustainability standards.

H1. State-owned enterprises and public institutions have higher adherence ratings than private companies.

We expect to find geographic differences in adherence ratings, arising from differences in culture, politics, and economic development. An analysis by Barkemeyer and colleagues (2015) shows that Asian organizations have extremely high GRI adoption rates relative to organizations in other parts of the world. In developing economies across Asia, stakeholders are calling for more transparency. Historically, labor standards and environmental regulations have been lax in Asian countries outside of Japan and Korea, and pressure has built up for organizations in developing countries to finally address their social and environmental impacts (Barkemeyer et al., 2015; Gugler and Shi, 2009). Asian organizations that have poor reputations for ESG performance may attempt to transform their image by complying with sustainability standards, as

compliance represents one step toward legitimacy for organizations' sustainability initiatives (Nikolaeva and Bicho, 2011).

In developed economies that value organizational transparency, such as the countries of the European Union, sustainability reporting is quickly becoming an institutional norm. In the early 2000s, Europe was the most active reporting region (Dilling, 2010). Organizations in European markets must uphold a wide range of environmental and social responsibilities that affect a broad set of institutional actors extending beyond traditional capitalist economic models (Barkemeyer et al., 2015). European organizations respond to demands from a comparatively wide range of stakeholder groups. By adhering to stringent environmental and social norms, European organizations are able to mitigate reputation and legitimacy problems. Additionally, many European Union countries require certain types of organizations to disclose non-financial information, and this practice may influence voluntary reporting. Even before the European Union Directive (EUD) on non-financial information took effect in 2017, public sector organizations were held accountable for their deployment of public resources (Nicolo, Zanellato, and Tiron-Tudor, 2020).

Conversely, North American countries, such as the United States, are characterized by individualism and market-based decision making. Barkemeyer and colleagues' (2015) report indicates that North American organizations have the lowest rates of GRI adoption. North American managers may be concerned about the potential agency costs associated with following sustainability guidelines, especially if compliance leaves them with fewer resources to invest in traditional business activities that affect market-based measures of financial performance (Jensen 2002). Furthermore, there is less institutional pressure on North American

organizations to report on all aspects of their sustainability programs because information asymmetry is not a primary concern among North American stakeholders (Connelly et al., 2011).

H2. Asian (a) and European (b) organizations have higher adherence ratings than North American organizations.

The OECD, which currently has 37 member countries, was founded in 1961 to stimulate global trade and economic progress. The OECD's mission has evolved over the years, and many of its current intitatives are related to sustainable economic development. The OECD has explicitly encouraged sustainability standards adoption and sustainability reporting, and it has even created its own set of standards, called the Guidelines for Multinational Enterprises (Kolk, 2005). The Guidelines are closely aligned with the GRI standards (Brown et al., 2009). In our sample, 6.8% of GRI reports reference the OECD Guidelines. Given the institutional pressure that the OECD can impose on member organizations, and given the fact that OECD-based organizations are expected to serve as exemplars of sustainable development, we posit that organizations in OECD countries will be likely to comply with GRI standards.

H3. Organizations in OECD member countries have higher adherence ratings than organizations in non-member countries.

Organization size is an important determinant of participation in sustainability programs (Schreck and Raithel, 2018), and there are several reasons why size could also affect compliance with sustainability standards. First, stakeholders assume large organizations have more significant environmental and social impacts than small organizations (Jansson, Nilsson, Modig, and Hed Vall, 2017). To gain legitimacy, large organizations must be transparent about their impacts on the environment and society, and stakeholders expect large organizations to install controls to prevent environmentally and socially irresponsible business practices. Second, large

organizations have more resources to devote to sustainability strategies (Nikolaeva and Bicho, 2011), whereas small organizations must be more cognizant of resource expenditures (Bougrain and Haudeville, 2002; Morgan, Anokhin and Wincent, 2018). Large organizations simply have more slack resources to leverage during the development and implementation of sustainability strategies, which ultimately affect compliance. Third, large organizations receive more media coverage, and the media is an institutional conduit that monitors and reports on organizational behavior. Media visibility asserts pressure to adhere to sustainability standards (Nikolaeva and Bicho, 2011). Fourth, government agencies often target large organizations for ESG missteps, assuming smaller firms will fall in line (Nikolaeva and Bicho 2011; DeCanio and Watkins 1998). To preempt potential conflicts with regulators, large organizations may closely follow their sustainability standards. Due to the aforementioned institutional pressures on large organizations, we argue that they will be relatively more likely to comply with the sustainability standards outlined in their reports.

H4. Large organizations have higher adherence ratings than small-to-medium size organizations.

External pressure from stakeholders affects organizational decisions about sustainability reporting (Huang and Watson, 2015). Organizations have multiple types of stakeholders, including shareholders, employees, customers, suppliers, communities, and government authorities. To achieve legitimacy, an organization's managers constantly balance the competing—and often conflicting—demands of each stakeholder group (Herremans, Nazari, and Mahmoudian, 2016). Unlike financial reporting, which is narrowly focused on issues that affect shareholders, sustainability reporting must address a broader range of issues that affect multiple stakeholder groups (Junior, Best, and Cotter, 2014). Appeasing multiple stakeholder groups is a

challenge, and to ensure that the organization is meeting the ESG information needs of different groups, the organization may form a stakeholder panel to provide guidance and feedback on its sustainability programs (GRI 101 Section 5.2). A stakeholder panel is an independent committee which consists of experts from various stakeholder groups with interests in the organization's operations. Panel members direct management's attention to issues that are not adequately addressed by the organization's current ESG investments so that no salient stakeholder group is overlooked. Furthermore, the panel releases a statement on the organization's overall sustainability efforts, which is included in the GRI report. Organizations that take the extra step of creating stakeholder panels to improve stakeholder engagement do so in order to increase their legitimacy across a wide range of stakeholder groups (Herremans, Nazari, and Mahmoudian, 2016). These organizations are also likely to invest more resources in their sustainability efforts and subsequent reporting processes, which should lead to relatively high adherence ratings.

H5. Organizations that rely on external stakeholder panels to guide sustainability strategies have higher adherence ratings than organizations that do not rely on stakeholder panels.

Some organizations face tremendous institutional pressures to be transparent about their sustainability initiatives (Nikolaeva and Bicho, 2011). For such organizations, simply meeting the minimum GRI standards may not be enough to gain legitimacy in the eyes of industry peers, regulators, and other salient stakeholders (Christensen et al., 2017). To enhance the credibility of their sustainability programs, organizations may add extra layers of assurance to their GRI reports (Manetti and Toccafondi, 2012; Simnett, Vanstraelen, and Chua, 2009). Organizations often contract with third parties (e.g., accounting firms, engineering firms, or small consultancies) to audit ESG information in sustainability reports, which is roughly equivalent to hiring accounting firms to audit financial statements (GRI 102 Section 56). The audits result in

external assurance statements that attest to the veracity of the reports. External assurance reduces agency costs and confers greater user confidence in the accuracy and validity of ESG information. Moreover, voluntarily providing external assurance attests to an organization's commitment to transparency and its desire to maintain a positive image (Simnett, Vanstraelen, and Chua, 2009). For these reasons, we suggest that organizations that engage outside auditors to verify their sustainability reports will closely adhere to GRI's standards and the corresponding reporting guidelines, resulting in relatively high adherence ratings.

H6. Organizations that use external audits of their sustainability reports have higher adherence ratings than organizations that do not use external audits of their sustainability reports.

Some organizations may experience greater institutional pressures to comply with sustainability standards due to their ownership structure. Companies that are listed on stock exchanges (i.e., publicly traded firms) must include shareholders in their audience, whereas companies that are not listed on stock exchanges (i.e., privately held firms) tailor their sustainability reports to other stakeholder groups, such as employees and customers. Given external pressure from stakeholders affects sustainability reporting (Huang and Watson, 2015), and some of the most influential external stakeholders of listed companies are shareholders, shareholders may partially drive conformity to sustainability standards. Institutional investors constitute a large and powerful group of stakeholders for most publicly traded companies due to the amount of capital under their control and their overall sophistication, and institutional investors are increasingly calling for more transparency regarding firms' sustainability investments, climate change risks, and regulatory risks (Dhaliwal, Li, Tsang, and Yang, 2011; Krueger, Sautner, and Starks, 2020). By contrast, privately held firms are less likely to publish

sustainability reports, and even if they do so, they are less likely to follow GRI standards than publicly traded firms (Hickman, 2020). We suggest that listed firms have higher adherence ratings as a result of institutional pressures from owners, which are more widely dispersed than those in private firms and are generally more concerned about information asymmetry (Gamerschlag, Möller, and Verbeeten, 2011; Hickman, 2020).

H7. Organizations listed on stock exchanges have higher adherence ratings than unlisted organizations.

3. Method

3.1. Sample description

We hired a professional data processing company to collect adherence ratings, organization-level information, and PDF copies of sustainability reports from GRI's Sustainability Disclosure Database (Global Reporting Initiative, 2021). The sample covers a period from 2005 through 2015 and contains information for all organizations that submitted reports under the G1-G3.1 reporting guidelines. Organizations that may have published a sustainability report during the period but did not adopt the GRI Standards are excluded from the sample. We cross-checked a subsample of the adherence and organizational records in the Sustainability Disclosure Database with matching information in the sustainability reports, and we did not find any discrepancies. The final sample for this study consists of unbalanced panel data for 4,380 unique reporting organizations, resulting in a sample size of 13,194 organization-year observations.

3.2. Dependent variable

The dependent variable for the analysis is GRI adherence ratings. The adherence ratings are originally recorded as grades, ranging from C to A^+. The researchers transformed the grades

into a grade point average (GPA) scale to facilitate interpretation. The resulting interval scale produces data that is approximately normally distributed. A value of 2.00 corresponds with a "C," a value of 2.33 corresponds with a "C^+," a value of 3.00 corresponds with a "B," a value of 3.33 corresponds with a "B^+," a value of 4.00 corresponds with an "A," and a value of 4.33 corresponds with an "A^+."

3.3. Independent variables

The independent variables in the study are all nominal variables. The first independent variable in the model, called "Organization Type," is an indicator variable that takes a value of 1 if the organization is a state-owned enterprise or public institution and a value of 0 if the organization is a private company. The term "private company" refers to a corporation, partnership, or subsidiary that is unaffiliated with a government entity. It does not distinguish between companies that are listed on stock exchanges (i.e., publicly traded companies) and companies that are not listed on stock exchanges (i.e., privately held companies) because, in some cases, corporations that are partly owned by government entities are traded on stock markets. The second independent variable, called "Region," is a nominal variable that reflects the region of the world in which the organization's headquarters are located. The "Region" variable consists of six categories, or levels: Asia, Europe, South America, Oceania, Africa, and North America. The "Region" variable takes a value of 1 if the organization is in Asia, a value of 2 if the organization is in Europe, a value of 3 if the organization is in South America, a value of 4 if the organization is in Oceania, a value of 5 if the organization is in Africa, and a value of 0 if the organization is in North America. The third independent variable in the model, called

"OECD Membership," is an indicator variable that takes a value of 1 if the organization is located in a member country of the OECD and a value of 0 if it is located in a country that does not belong to the OECD. The fourth independent variable, called "Organization Size," is an indicator variable that takes a value of 1 if the organization is a large organization and a value of 0 if the organization is a small-to-medium size organization. This measure is based on the European Union (EU) definition of small-to-medium size enterprises (SMEs). Small organizations have fewer than 250 employees and less than € 50 million in revenue or a balance sheet total of less than € 43 million. The fifth independent variable, "Stakeholder Panel," is an indicator variable that takes a value of 1 if a panel of stakeholders or industry experts provides feedback on a sustainability report and a value of 0 otherwise. The sixth independent variable, "External Assurance," is an indicator variable that takes a value of 1 if an external entity audits the organization's report and a value of 0 otherwise. Accounting firms (e.g., KPMG, Deloitte) are the most common external assurance providers, although some engineering firms (e.g., Bureau Veritas, DHV) and smaller consultancies (e.g., AENOR, Two Tomorrows) also audit sustainability reports. The seventh and final independent variable in the model, "Listing," is an indicator variable that takes a value of 1 if the organization is listed on a stock exchange and a value of 0 if it is not listed. This measure separates publicly traded companies from all privately held firms, partnerships, and public institutions.

3.4. Control variables

In addition to the primary variables of interest, we include theoretically relevant control variables in the model to mitigate problems related to omitted variable bias (Spector and Brannick 2011). The two control variables are called "Industry" and "Experience" in the Results table. "Industry" is a nominal variable consisting of 10 levels, or categories, that correspond with

the two-digit Standardized Industrial Classification (SIC) codes. Prior research shows that industrial norms affect sustainability reporting practices (Hahn and Lülfs, 2014), and thus it is important to control for industrial effects in the analysis so that we can focus on the partial effects of other institutional factors that pertain to our hypotheses. The reference category for "Industry" is the Public Administration category (SIC codes 91-99). The second control variable, "Experience," is a measure of the number of years that the organization has published a GRI-sanctioned sustainability report during the period 2005-2015. In the sample, most organizations that publish a sustainability report in one year also publish reports in subsequent years. Organizations may learn from past sustainability reporting experiences, which may lead to an increase in adherence ratings over time. The "Experience" variable controls for the effect of organizational learning on the dependent variable. Table 1 displays Pearson correlation coefficients and descriptive statistics for the variables in the analysis.

[Insert Table 1 here.]

3.5. Analysis

We rely on the generalized estimating equation (GEE) method developed by Liang and Zeger (1986) to analyze the data. Using the GENMOD procedure in SAS 9.4, we specify a GEE model with a Gaussian distribution, an identity link function, and an unstructured correlation matrix. The GEE model provides a convenient way to analyze unbalanced panel data, and it accommodates the serial correlation and heteroscedasticity that is present in our dataset (Zorn, 2001). One key difference between GEEs and other common methods of analyzing panel data, such as random effects (RE) and fixed effects (FE) models, is that the GEE is a marginal, or population-averaged, approach to estimation (Zorn, 2001). RE and FE models represent conditional, or subject-specific, approaches to correlated data analysis. The population-averaged

model allows us to answer the question of whether GRI adherence ratings depend on certain institutional factors which remain relatively stable over time (e.g., location of organizational headquarters). By contrast, subject-specific models are more appropriate if, for example, we were to question whether an organization's GRI adherence rating changes when an organization moves its headquarters to a different country. Because our hypotheses center on the marginal effects of covariates, the population-averaged model is the best choice for the analysis (Hardin and Hilbe, 2013; Shah, Ball, and Netessine, 2017).

Another key difference between GEEs and subject-specific models is that the former require a priori specification of a working correlation matrix (Zorn, 2001). We compare values of the quasilikelihood under the independence model criterion (QIC) developed by Pan (2001) to select the most appropriate correlation structure for the data (Hardin and Hilbe, 2013). The QIC value for the GEE with an unstructured correlation matrix (13267.78) is slightly lower than the QIC values for models with AR(1) and exchange correlation matrixes, indicating the unstructured correlation matrix provides the best fit to the data. Robust standard errors are correctly computed in GEE models, and they are valid even when the correlation structure is misspecified (Zorn, 2001).

4. Results

Table 2 displays the results of the analysis. H1 proposes state-owned enterprises and public institutions have higher adherence ratings than private companies. In the analysis, the reference category is private companies, and thus the statistically significant and positive parameter estimate for Organization Type ($Z = 4.06$, $p < .01$) indicates state-owned enterprises and public institutions have higher GRI adherence ratings than private companies. H1 is supported. H2 proposes Asian (a) and European (b) organizations have higher adherence ratings

than North American organizations. In the analysis, the reference category is North America. The statistically significant and positive parameter estimates for Region: Asia ($Z = 17.67$, $p < .01$) and Region: Europe ($Z = 6.54$, $p < .01$) suggest that Asian and European organizations have higher adherence ratings than North American organizations. H2 (a) and H2 (b) are supported. H3 proposes organizations in OECD member countries have higher adherence ratings than organizations in non-member countries. The statistically significant and positive parameter estimate for OECD Membership ($Z = 8.01$, $p < .01$) indicates organizations in OECD member countries have higher adherence ratings than organizations located outside the OECD. H3 is supported. H4 proposes large organizations have higher adherence ratings than small-to-medium size organizations. The reference category is small-to-medium size organizations. Therefore, the statistically significant and positive parameter estimate for Organization Size ($Z = 5.87$, $p < .01$) indicates large organizations have higher adherence ratings than smaller peers, supporting H4. H5 maintains organizations that rely on external stakeholder panels to guide sustainability strategies have higher adherence ratings than organizations that do not rely on stakeholder panels. The parameter estimate for Stakeholder Panel ($Z = 0.79$, $p = .43$) is not statistically significant. H5 is not supported. H6 proposes organizations that use external audits of their sustainability reports have higher adherence ratings than organizations that do not use external audits of their sustainability reports. The statistically significant and positive estimate of External Assurance ($Z = 24.55$, $p < .01$) indicates organizations that provide external assurance have higher adherence ratings than organizations that do not provide a form of external assurance. H6 is supported. Finally, H7 proposes organizations listed on stock exchanges have higher adherence ratings than unlisted organizations. The reference category is unlisted organizations, so the statistically significant and positive estimate of Listing ($Z = 7.06$, $p < .01$) supports H7.

With respect to the control variables, the results indicate that organizations in the mining, construction, transportation, and financial services industries have relatively high adherence ratings. Furthermore, reporting experience is positively related to adherence ratings.

[Insert Table 2 here.]

5. Discussion and conclusions

Our study makes multiple contributions to the literature. First, we directly answer calls for research on sustainability standards (Stilgoe et al., 2013; Wagner, 2020). More importantly, we add to the emerging literature on sustainability standards by explaining how institutional factors affect the implementation of sustainability strategies and sustainability reporting. Prior research suggests that the adoption of sustainability standards provides direction for an organization's sustainability strategy in the absence of international regulations and may ultimately lead to sustainable economic development, in much the same way that adoption of innovation standards ultimately leads to new products and services (Von Geibler, 2013). We start with this premise, and we find that an organization's institutional environment influences the extent to which it complies with sustainability standards. When certain institutional factors are not present, organizations feel relatively less pressure to comply with sustainability standards, and actual organizational processes may decouple from the standards. Although science and technology scholars are growing weary of the "institutional realities" that limit responsible innovation practices and outcomes (as quoted in Stilgoe et al., 2013, p. 1577), our results suggest that many of the same institutional factors affect compliance with sustainability standards.

The results also suggest that highly visible organizations, such as large public institutions and publicly traded corporations, are most likely to adhere to the GRI standards. Organizations with greater visibility possess characteristics associated with status and prominence, which make

the organizations widely known (Yu, Lo, and Li, 2017). Prior research finds that visible organizations are more likely to adopt GRI standards and produce sustainability reports (Schreck and Raithel, 2018). Highly visible organizations are significantly affected by institutional pressures, and, over time, many large public institutions and publicly traded corporations have adopted GRI standards through the processes involved in mimetic and normative isomorphism (Brown et al., 2009; Amran and Haniffa, 2011). Our results suggest that the effects of institutional pressures extend beyond the adoption of sustainability standards; they also affect compliance with the standards. Large public institutions and publicly traded companies are now expected to produce sustainability reports, and as reporting becomes a norm, strict adherence to the standards is also becoming a norm.

We find geographic differences in adherence levels stemming from differences in culture, politics, and economic development. For instance, Asian and European organizations have relatively high adherence ratings, but the mechanisms behind compliance differ. In developing economies in Asia, environmental and governance regulations are relatively lax, and information asymmetry between organizations and interested stakeholders represents a significant social problem (Barkemeyer et al., 2015). To overcome potential negative reputation and legitimacy issues, Asian organizations have a strategic incentive to conform to sustainability standards. In the case of for-profit Asian corporations, transparency may even be a source of competitive advantage. In Europe, organizations have embraced the concept of stakeholder management, and many European countries require that certain types of organizations disclose non-financial information (Barkemeyer et al., 2015). We suggest that a different philosophy in Europe is driving high adherence ratings, and there may be a positive spillover effect of required ESG disclosures on the voluntary reporting of ESG information. In other words, coercive

isomorphism regarding compliance spreads to other organizations that are not legally obligated to disclose non-financial information, but do so anyway to maintain a positive reputation and gain legitimacy.

One public policy implication of the study is that we are able to identify organizations that are most likely to successfully implement sustainability standards and which are most likely to fail. The results of the study demonstrate that state-owned enterprises, public institutions, organizations in Asia, organizations in Europe, organizations in OECD member countries, large organizations, organizations that provide external assurance, and publicly traded corporations have higher adherence ratings than private companies, organizations in North America, organizations outside of the OECD zone, small organizations, organizations that do not provide external assurance, and privately held companies, respectively. Policy makers may use this information to direct resources and support to organizations that will probably encounter difficulties with standard setting. In particular, small-to-medium size organizations are crucial to most economies and play vital roles in larger supply chains, yet they have historically struggled to develop and implement sustainability strategies (Jansson et al., 2017). Our results indicate that even if small-to-medium size organizations adopt an established set of sustainability standards, they may not be able to comply with them, so they could use additional support from government agencies.

The results also demonstrate political institutions are an important factor in compliance. The GRI standards fill a void created by a lack of international rules and regulations for sustainability reporting (Vigneau et al., 2015). Ironically, political institutions that promote ESG transparency put pressure on organizations to adhere to sustainability standards, resulting in higher levels of compliance. Therefore, we find relatively high adherence ratings for

organizations in European countries and in OECD member countries. Political pressure has a positive effect on compliance, even when formal regulations or legal mandates are not in place.

For regulatory agents, our results suggest external assurance statements are signals of compliance with sustainability standards. Organizations that hire external auditors to verify the ESG information contained within sustainability reports have higher adherence ratings than organizations that do not provide forms of external assurance. The accounting, engineering, and consulting firms that audit reports seem to provide the proper level of oversight, in much the same way that external auditors of financial information reduce fraud, tax evasion, etc. The value of sustainability reporting depends upon the credibility of the information in reports. External audits enhance reports' credibility, and they may become a useful tool for regulators that are becoming increasingly wary of greenwashing (Kim and Lyon, 2015).

Although this study has implications for theory and public policy, it also has limitations. First, the focus of this study is on the GRI standards and the corresponding GRI reporting framework. Although GRI is the dominant paradigm for sustainability reporting, there are alternative standards. Moreover, some organizations rely on multiple standards to guide their sustainability strategies. In our sample of GRI reports, 6.8% of reports explicitly reference the OECD Guidelines for Multinational Enterprises, 8.2% mention ISO 26000, and 27.7% mention the UN Global Compact Principles. More research is needed to understand how these standards overlap, and how organizations that follow multiple sets of standards perform. Second, our sample ends in 2015, but sustainability reporting is more popular in 2021 than ever before. Due to the changing nature of the GRI framework, we are not able to appropriately measure compliance post-2015. However, understanding how conformity to sustainability standards has changed over the last several years is of theoretical relevance to scholars and practical relevance

to policy makers. Third, our secondary data analysis sacrifices depth for breadth in that it does not contain direct feedback from managers or stakeholders. More qualitative studies and survey research on the subject of sustainability standards are necessary to fully understand how managers develop their sustainability strategies and how stakeholders respond. In conclusion, we believe our research design produces generalizable results, while acknowledging that it lacks the rich description and nuance that is associated with qualitative research and survey research.

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Table 1. Correlation Matrix and Descriptive Statistics

Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Adherence Rating	-									
Organization Type	.00	-								
Region	-.12**	.02*	-							
OECD Membership	.01	.05**	.50**	-						
Organization Size	.15**	-.11**	-.07**	-.08**	-					
Stakeholder Panel	.09**	.02*	-.07**	-.04**	.03**	-				
External Assurance	.34**	.08**	-.02	-.01	.06**	.25**	-			
Listing	.09**	-.19**	-.05**	-.05**	.23**	.08**	.19**	-		
Industry	.06**	-.06**	-.01	.02*	.08**	.01	.04**	.05**	-	
Experience	.01**	-.04**	.14**	.15**	.14**	-.01	.09**	.09**	.08**	-
Mean	3.21	.11	3.15	.66	.90	.06	.25	.47	4.32	4.40
Standard Deviation	.86	.32	1.33	.48	.30	.23	.43	.50	2.96	2.19

* p .05, ** p < .01

Table 2. Results

Hypothesis	Variable	Estimate	S.E.	Z
H1	Organization Type	0.11	0.03	4.06**
H2 (a)	Region: Asia	0.79	0.04	17.67**
H2 (b)	Region: Europe	0.22	.03	6.54**
	Region: South America	0.53	.05	10.06**
	Region: Oceania	0.08	0.06	1.24
	Region: Africa	0.09	0.07	1.22
H3	OECD Membership	0.30	.03	8.01**
H4	Organization Size	0.19	0.03	5.87**
H5	Stakeholder Panel	0.01	0.01	0.79
H6	External Assurance	0.28	0.01	24.55**
H7	Listing	0.10	0.01	7.06**
	Industry: Agriculture	0.06	0.04	1.40
	Industry: Mining	0.33	0.05	6.70**
	Industry: Construction	0.18	0.05	3.43**
	Industry: Manufacturing	0.02	0.06	0.39
	Industry: Transportation	0.20	0.03	6.06**
	Industry: Wholesale	0.00	0.05	0.09
	Industry: Retail	-0.00	0.04	-0.15
	Industry: Finance	0.13	0.03	3.50**
	Industry: Services	0.00	0.05	0.16
	Experience	0.09	0.00	18.07**

* $p < .05$, ** $p < .01$