

RESEARCH ARTICLE

Do ESG reporting guidelines and verifications enhance firms' information disclosure?

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Abstract

Environment, social, and governance (ESG) reporting guidelines are institutional rules that can enhance the credibility of firms' publicly disclosed information related to ESG. Reporting is often voluntary and global ESG reporting guidelines typically rely on process-focused third party verification. However, in developing its reporting guidelines, the Japanese government gave firms the unusual option of pursuing either process- or content-focused verification. This paper draws on the unique Japanese setting to examine whether firms that use ESG reporting guidelines increase their quantity of disclosed sustainability information. Furthermore, it assesses whether, given the option, (1) firms tend to pursue process- or content-focused verification, and (2) which type of verification leads to greater information disclosure. We show that firms that follow ESG guidelines disclose 39% more sustainability information compared to firms that publish sustainability reports but do not follow ESG reporting guidelines. Content-focused verification leads to greater information disclosure than process-focused verification in that firms publish 23% more text in their sustainability reports. Moreover, given the option, firms prefer to use content- over process-focused verification. However, most global ESG reporting guidelines endorse process-focused verification and this verification is less effective than content-focused verification at encouraging firms' information disclosure. Our findings raise a timely and relevant question about the movement by global ESG standard developers to promote process- rather than content-focused verification. They also suggest that firms that wish to create sustainability distinction by way of ESG reporting may benefit by advocating for more robust forms of verification.

KEYWORDS

environmental reporting, ESG, non-financial reporting, sustainability guidelines, sustainability information disclosure, sustainability reporting, third party verification

1 | INTRODUCTION

ESG reporting involves firms publicly disclosing their impacts related to environment, society, and governance (ESG), and is more

broadly known as “sustainability reporting.” Unlike financial reporting, which is shaped by well-established accounting standards and required by publicly traded firms (World Economic Forum, 2020), ESG reporting practices are less well defined

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(Erkens et al., 2015). ESG reporting is also typically voluntary. Both factors have led to inconsistencies in reporting content across firms and raised questions about the quality and accuracy of the disclosed information (Morhardt et al., 2002; Sethi et al., 2017). Firms have often used their judgment to establish, interpret, and operationalize performance objectives (Michelon et al., 2015). This institutional setting has led to significant variation in the quantity (Beretta & Bozzolan, 2004) and credibility (Michelon et al., 2015) of information that firms report. Such variation is problematic when external stakeholders wish to reward firms for their superior sustainability performance (through purchasing, investing, and other actions) but lack comparable and credible information.

ESG reporting guidelines have emerged as institutional rules to address these concerns by shaping what content and procedures that are deemed legitimate for sustainability information disclosure (Burgemeestre et al., 2014). These guidelines are designed to provide a clear framework that firms use to publicly disclose their sustainability information (Romito & Vurro, 2020). They also encourage third party verification, which is designed to enhance the credibility of information included in firms' reports (Gond et al., 2012; López-Santana, 2006). While several prior studies discuss the determinants of ESG reporting (Hahn & Kühnen, 2013), legitimation strategies of sustainability reporting (Hahn et al., 2021), the value prospects of sustainability reporting (Hess, 2007), and the extent to which ESG reporting addresses the United Nations Sustainable Development Goals, less is known about *how* ESG reporting guidelines influence firms' quantity and credibility of disclosed information (Kouloukoui et al., 2019; Mio, 2010; Rim et al., 2019; Romolini et al., 2014; Tsang et al., 2009). Moreover, to our knowledge, no study examines the different types of third party verifications and whether they improve firms' information disclosure to the same extent.

While *process-focused verification* assures whether a firm's report conforms to the established reporting rules and standard, *content-focused verification* focuses on the completeness, accuracy, and quality of information included in reports. Although both verifications have the potential to improve firms' information disclosure, content-focused verification is more robust because it emphasizes quality and substance of firms' disclosed information rather than rule conformance. However, the five most widely used ESG reporting guidelines globally—Global Reporting Initiative (GRI), Sustainability Accounting Standards Board, Carbon Disclosure Project, International Integrated Reporting Council, and Carbon Disclosure Standards Board (Threlfall et al., 2020)—all embrace process-focused verifications. In spite of its weaker structure, the process-focused verification promoted by these ESG reporting guidelines also meets recent government expectations in Japan, EU member countries, and other government settings for the “disclosure of non-financial and diversity information” (e.g., European Union, 2014; Tanaka, 2015).

In this paper, we address three important questions. First, do firms that follow ESG reporting guidelines improve the quantity of their information disclosure? Second, if given the choice, are firms more likely to use process- or content-focused third party verification? Third, does content-focused third party verifications lead to greater information disclosure over process-focused verifications?

To explore these questions, we focus on the unique setting of Japan's sustainability reporting standard between 2001 and 2005. In 2001, the Japanese Ministry of the Environment, also known as the Japanese Environmental Protection Agency (EPA), developed its *Environmental Reporting Guidelines* to govern firms' sustainability reporting (Tanaka, 2015) and inform investors who were interested in the environmental management and governance information contained within the ESG reporting framework (Ministry of Environment, 2018). To our knowledge, the 2001 Japanese reporting guidelines are the *only* example globally of an ESG reporting standard that created the option for firms to choose whether to use either process- or content-focused third party verification. Beginning in 2006, the Japanese EPA modified its guidelines to closely resemble the most widely recognized international ESG reporting standards, all of which exclusively promote process-focused verification. This study focuses on Japanese firms between the critical time between 2001 and 2005, when the Japanese EPA uniquely offered firms two verification options and before the proliferation of other ESG standards. This important and unusual historical setting creates a natural experiment and enables us to compare the outcomes of process- and content-focused verifications in a consistent manner while accounting for the country-level regulatory and socio-economic contexts.

After accounting for self-selection bias using propensity score matching, our findings offer evidence that firms which follow ESG reporting guidelines tend to disclose more sustainability information than firms that do not follow the guidelines. Firms that rely on ESG guidelines publish 39% more text in their ESG reports. Additionally, when firms are given the option of utilizing process- or content-focused verification, they are more likely to choose the latter, which is a more robust verification that emphasizes quality and substance of firms' disclosed information rather than rule conformance. Finally, firms whose sustainability reports utilized content-focused verification publish 23% more text than firms whose reports utilized process-focused verification, suggesting that content-focused verification offers greater potential to credibly inform stakeholders about firms' ESG activities.

Our findings offer promise about the role of ESG reporting guidelines in improving sustainability information quantity and credibility. Moreover, our findings raise important concerns about the strong movement by developers of ESG standards to promote and institutionalize process- rather than content-focused verification as the former leads to less information disclosure over the content-focused verification. Firms that wish to appeal to sustainability-minded stakeholders and use ESG reporting to legitimize their sustainability practices might therefore benefit by working actively with the ESG standards developers to create opportunities for distinction that come with more robust forms of verification.

2 | THEORY

2.1 | ESG reporting guidelines

Non-financial reporting is the public disclosure of organizational performance information beyond what is typically included in a



traditional assessment of financial performance (Erkens et al., 2015; Romito & Vurro, 2020). Examples include outcomes related to firms' social impacts, environmental accounting, community outreach activities, philanthropic gifts, and corporate social responsibility.

ESG reporting is the formal disclosure and communication of a firm's sustainability goals, recognized more specifically as their environmental, social, and governance goals, as well as its progress toward achieving those goals. With greater information in hand, external stakeholders are better equipped to assess firms' overall performance and shape their purchasing and investment decisions to reward more sustainable firms (Rhodes, 2010; Sarti et al., 2018). This information can also influence stakeholder confidence and improve corporate reputation (Lenox & Nash, 2003), while motivating firms to reduce their negative environmental and social impacts (Michelon et al., 2015). All these factors can improve firm profitability (Darnall, Henriques & Sadorsky, 2008).

Many European countries, in addition to stock exchanges in Asia and India, for instance, require ESG reporting (European Union, 2014; Hess, 2007; Hoffmann et al., 2018; Schrader, 2019). However, the exact content or procedures for information disclosure is not defined, and there is significant leeway in the expectations of what and how firms should report (Hahn et al., 2021).

In most other instances, governments do not require ESG reporting but they encourage it and suggest that firms use ESG reporting guidelines to assist. Guidelines are normative and non-binding governance tools that define a societal objective or goal and specify substantive standards or rules that firms should follow to achieve these goals (López-Santana, 2006). For instance, in 2001, Japan developed its own reporting guidelines in an effort to steer firms' sustainability reporting practices, especially related to environmental impacts (Chen et al., 2014; Tanaka, 2015). By 2022, there were more than a dozen major international frameworks in existence which offer guidance on ESG reporting that should be contained in companies' sustainability reports. However, most firms rely on one of five international ESG reporting guidelines, which have been developed by professional associations that include: Global Reporting Initiative (GRI), Sustainability Accounting Standards Board, Carbon Disclosure Project, International Integrated Reporting Council, and Carbon Disclosure Standards Board (Threlfall et al., 2020). Of these, GRI dominates the field, with 67% of firms that use ESG reporting guidelines following the GRI reporting standard (Threlfall et al., 2020). While there are some differences between the various ESG reporting frameworks, there is significant overlap. This has created confusion for both firms as they develop their sustainability reports and investors as they compare firms' sustainability activities. In response, in 2020, these standard-setting organizations pledged their commitment to collaborate to create a unified reporting standard that integrates both financial and sustainability disclosure (Guillot, 2020). Although GRI has since announced that it will remain independent (Cohen, 2021), the merger of the remaining four organizations represents a significant shift toward the consolidation of ESG reporting guidelines globally (World Economic Forum, 2020) and creates an enormous opportunity to enhance the robustness of existing ESG reporting.

To assess the extent to which ESG reporting guidelines influence firms' information disclosure, institutional theory provides an important lens as described in the section that follows.

2.2 | ESG reporting guidelines and institutional theory

Organizations operate within an institutional setting that establishes rules and norms, and that shapes and constrains their strategic behaviors. Rules and norms are usually codified by institutional entrepreneurs, who are the organizations or individuals that leverage resources to influence existing institutions or create new ones (Battilana et al., 2009). They include governments and professional networks (DiMaggio & Powell, 1983) that not only promulgate new norms and rules but also actively participate in their implementation (Battilana et al., 2009). When these new rules are perceived as legitimate and socially appropriate, they become followed by many organizations and recognized as "a cognitive base" that shapes broader organizational practices and behaviors (DiMaggio & Powell, 1983, p. 152). This setting encourages firms to have a shared understanding of their social obligations and adopt similar practices, strategies, and procedures that are regarded as appropriate (Scott, 2008). The outcome is that organizations conform (DiMaggio & Powell, 1983) and doing so can increase their credibility with external stakeholders and fuel their competitiveness (Meyer & Rowan, 1977; Suchman, 1995).

ESG reporting guidelines have become important institutional rules that codify societal expectations for sustainability information disclosure and shape the legitimation of certain reporting practices (Shabana et al., 2017). Guidelines offer firms direction on what they should disclose and softly dictate a set of sustainability objectives, courses of action, and approaches to do so (López-Santana, 2006), thus enhancing integrated sustainability thinking across the organization. Due to the normative nature of ESG guidelines and the lack of regulatory mandate, firms that follow these guidelines are free to adapt their reporting content and procedures and disclose more or less information (Hahn et al., 2021), although they should adhere to a template that guides their ESG reporting efforts. While this flexible structure allows firms to customize their sustainability reporting to their specific circumstances, ESG guidelines are expected to encourage greater information disclosure around key sustainability metrics (Maroun, 2020). However, assessments of ESG reporting guidelines are lacking (e.g., Hahn & Kühnen, 2013; Morhardt, 2001; Skouloudis et al., 2009), especially as they relate to the quantity of information that firms report and the credibility of that information.

2.3 | Information quantity

Firms that disclose ESG information can facilitate transparency and accountability with external stakeholders (Dando & Swift, 2003; Williams, 2008) because they provide the basis for external stakeholders to compare a firm's observed sustainability practices and

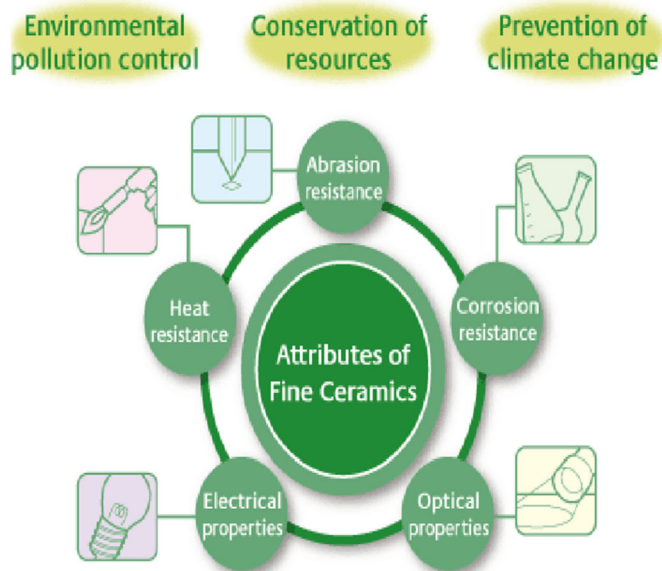


FIGURE 1 Pages from two different corporate sustainability reports [Colour figure can be viewed at wileyonlinelibrary.com]

performances with its claims (Bewley & Li, 2000; Burgemeestre et al., 2014; Kassinis & Panayiotou, 2018). Key to this argument is that a reasonable quantity of information must be disclosed. Information quantity refers to the *amount* of relevant information that firms publicly disclose (Dando & Swift, 2003). While information quantity does not necessarily measure quality, any quantifiable measure of quality requires a measure of information (Hilbert, 2012). Related to firms' ESG reporting, there is significant variation in the quantity of information that firms disclose (Hahn et al., 2021; Helfaya et al., 2019). For instance, some firms' ESG reports involve little actual text explaining their sustainability activities. These firms instead fill the contents of their sustainability reports with catchy images or diagrams (Kassinis & Panayiotou, 2018; Lyon & Maxwell, 2011; McQuarrie & Mick, 2003), as demonstrated in the left image of Figure 1. For example, after BP's Deepwater Horizon disaster in 2010, the company faced significant public criticism about the environmental harms that the disaster had caused. To avert public attention, on its website, BP reduced the amount of substantive textual information about its environmental practices and replaced it with a multiplicity of idyllic sustainability images (Kassinis & Panayiotou, 2018). The inclusion of these images helped BP mitigate the risk of its stated corporate practices being regarded as contradictory with its actual practices (Kassinis & Panayiotou, 2018). This example illustrates why previous studies examining firms' sustainability claims and their symbolic actions have focused primarily on assessing firms' verbal rhetoric and narratives (e.g., Kassinis & Panayiotou, 2018; Lyon & Maxwell, 2011; McQuarrie & Mick, 2003).

We suggest that the institutional rules of ESG reporting guidelines encourage firms to disclose greater quantities of sustainability information than firms that publish sustainability reports but do not follow ESG guidelines. Our rationale is that firms which follow ESG

reporting guidelines are obligated to follow a reporting template, which provides a clearer understanding of what information firms should disclose. The template also encourages greater reporting around specific sustainability indicators codified in the guidelines (Potoski & Prakash, 2004). While ESG guidelines do not specify the number of pages or words that should be contained in a firm's sustainability report, firms are expected to fulfill the elaborated expectations of guidelines by disclosing specific information about their ESG actions, performance goals, impacts, and leadership. The likely outcome is that firms provide more actual text in their sustainability reports (Livesey & Kearins, 2002; Williams, 2008), which increases stakeholders' ability to compare different reports and scrutinize the information (Bewley & Li, 2000; Tschopp & Nastanski, 2014). This institutional arrangement thus encourages firms to report more credible information (Michelon et al., 2015) (see right image in Figure 1).

Hypothesis 1. Compared to firms that do not follow ESG guidelines, firms that follow ESG reporting guidelines are more likely to disclose a greater quantity of sustainability information.

2.4 | Information credibility

Although increasing the quantity of the information disclosed does not necessarily mean that this information is of high quality (Minutiello & Tettamanzi, 2021; Plumlee et al., 2015), there is good reason to believe that firms which follow ESG reporting guidelines may also improve their information credibility. Information credibility refers to the extent to which external stakeholders perceive firms' sustainability information to be trustworthy and reputable (Joshi

et al., 2007). At their core, all ESG reporting guidelines—whether sponsored by government or professional associations—promote third party verification to enhance the credibility of firms' information disclosure (Chen et al., 2014). Third party verification is the process by which an independent body assesses whether the information in a firm's sustainability report fulfills the expectations of the guidelines (Dando & Swift, 2003; KPMG, 2013). Verification is promoted by guideline developers because it imposes rules that encourage firms to develop routines and systems that can improve sustainability outcomes (de Moor & de Beelde, 2005). Moreover, verification imposes costs to firms in the way of preparing for the audit and hiring an external verifier, both of which may increase firms' commitment to developing a sustainability report that is more credible with external stakeholders.

In spite of the merits of third party verification, firms have historically avoided the external verification process (Laufer, 2003), in large part due to the additional costs that come with third party verification and the possible risk that a firm's misleading information may be detected. For example, in 2013, only 38% of 4100 published sustainability reports were third party verified for their report content (KPMG, 2013). However, the use of external verification is now more common, with more than half of firms that follow ESG reporting guidelines undergoing third party verification of their sustainability reports (Threlfall et al., 2020).

Prior sustainability reporting scholarship has generally focused on the broader concept of verification (or auditing) rather than its various forms. To our knowledge, no studies have assessed firms' preferences for different types of verifications. We also lack understanding about whether different types of verifications lead to equivalent information disclosure.

There are at least two types of third party verifications: *process-focused verification* and *content-focused verification*. *Process-focused verification* involves a professional auditing company that certifies whether the information contained in a firm's sustainability report follows the expected reporting procedures. Firms are familiar with this sort of verification as it is similar to the typical accounting audit process that emphasizes “tests of the underlying data and control” (Maroun, 2020, p. 199). Process-focused verification often results in an objective assurance about a firm's compliance with a set of neutral parameters and criteria (Maroun, 2020) rather than assessments that evaluate either the quality or substance of the firm's sustainability information (Sethi et al., 2017). It also tends to encourage firms to “tick a conformance box,” by adapting their current reporting practices to comply with the standard rather than encouraging systematic change (Mazzotta et al., 2020).

Process-focused is the verification required by the top five ESG reporting guidelines (see Table 1). For example, GRI's ESG reporting guidelines emphasize “auditability of information forms,” rather than information content (O'Dwyer & Owen, 2007, p. 80). Third party auditors are required to verify whether firms have reported on

TABLE 1 Five most common international ESG reporting frameworks and Japanese ESG reporting framework

ESG reporting guideline	Year founded	Form of ESG report	Description	Verification focus
1. Global reporting initiative	1997	Sustainability report	Creates a framework that is applicable to all types of organizations and sectors for disclosing both positive and negative impacts to the environment, society, and the economy.	Process
2. Sustainability accounting standards board	2012	U.S. Securities and Exchange Commission 10-K, 20-F filings	Establishes industry-specific standard aimed to focus on information that is financially material at the company level. Centers on a small number of topics per industry that are highly quantitative to enhance comparability.	Process
3. Carbon disclosure project	2000	CDP questionnaire	Provides investors with highly standardized climate data. Applicable to firms internationally and across sectors.	Process
4. International integrated reporting council	2010	Integrated annual sustainability report or standalone report	Establishes integrated reporting, which urges companies globally to issue “concise” integrated reports (combining traditional, annual financial with sustainability data).	Process
5. Carbon Disclosure Standards Board	2007	Sustainability report	Global framework that integrates environmental information and business impacts with mainstream financial reporting to equate natural capital with financial capital.	Process
Japanese Environmental Protection Agency	2001	Sustainability report	Most widely used framework in Japan until 2005 that provides guidelines for firms to report their impacts to the environment, society, and the economy.	Process or Content

performance indicators that include criteria on energy, biodiversity and emissions. However, auditors do not verify whether firms' reported information about these indicators is accurate, which creates incentives for firms to systematically exclude important information that is relevant to external stakeholders but also puts the firm in an unfavorable light (Mozzatta, Bronzetti, & Veltri, 2020).

By contrast, *content-focused verification* generally involves a panel of expert stakeholders that assures the information quality and reliability of a firm's sustainability report (Maroun, 2020). This verification requires that auditors have significant knowledge about sustainability (Sethi et al., 2017) that they apply in their intensive reviews and validations of firms' sustainability information quality, accuracy, and comprehensiveness (Kokubu & Nashioka, 2005). Experts typically include environmental NGOs and/or academics who are expected to scrutinize the firm's ESG information and offer feedback on how to improve its sustainability efforts and related reporting. This additional scrutiny is more likely to expose firms' attempts at greenwashing.

Although both types of verification assess whether a firm conforms to a guideline's established rules and standards, content-focused verification involves a more intense review process compared to process-focused verification. For this reason, content-focused verification can be regarded as being riskier for companies to use than process-focused verifications (Kokubu & Nashioka, 2005). One offset to this risk may be that stakeholders can reward firms that undergo content- over process-focused verification. However, stakeholders generally lack the information needed to differentiate among different forms of third party verification, which likely makes content-focused verification less appealing to firms.

Hypothesis 2. Compared to firms that do not follow ESG guidelines, firms that follow ESG reporting guidelines are more likely to pursue process- over content-focused verification.

2.5 | Verification and information quantity

Most ESG reporting guidelines have converged to emphasize process-focused verification. However, scholars have raised questions about this type of verifications and its ability to sufficiently improve firms' sustainability information disclosure (Channuntapipat, 2021; O'Dwyer, 2011; Sethi et al., 2017). Concern relates to the fact that the rules associated with process-focused verification are not sufficiently strong for firms to disclose greater amounts of sustainability information. The primary verifiers for process-focused verifications are major accounting and financial firms, whose core business is the auditing of financial reports and financial consultation (Fernandez-Feijoo et al., 2017; Threlfall et al., 2020). These auditing companies generally lack the specific expertise to provide in-depth feedback about substantive sustainability concerns. Moreover, because process-focused verification assesses whether firms follow the expectations of the ESG reporting guidelines (rather than the sustainability

content), verifiers are less competent at evaluating content outside of accounting measures and claimed sustainability investments (O'Dwyer, 2011; Sethi et al., 2017).

Other questions about process-focused verification relate to the independence of verifiers (Channuntapipat, 2021; O'Dwyer, 2011). As noted above, the core focus of accounting firms is to provide financial consultation (Sethi et al., 2017). Clients who typically use these organizations' accounting and financial services are more likely to use their ESG verification services, which creates a potential conflict of interest in that, if a verifier delivers a harsh sustainability audit, the accounting firm may risk losing this client and all its related business (Channuntapipat, 2021; O'Dwyer, 2011; Sethi et al., 2017). As a result, accounting firms tend to limit their audit scope to a narrow area (e.g., investments in sustainability) (Sethi et al., 2017).

Other conflicts relate to the commercialism underlying process-based verification, which is premised on a contractual relationship subject to competitive and commercial pressures (Boiral et al., 2019). Verifiers strive for customer satisfaction and competitive pricing, which encourages assurance providers to undertake more perfunctory audits. These conflicts can reduce the quality of sustainability reporting (Boiral et al., 2019).

By contrast, *content-focused verification*, by its nature, typically involves verifiers who work at NGOs and universities (Kokubu & Nashioka, 2005). These individuals generally have greater independence in the verification process because auditing is not their single source of revenue (Wong & Millington, 2014). Additionally, these verifiers are more likely to have greater sustainability expertise and competence at assessing firms' ESG data and sustainability claims (Wong & Millington, 2014). To receive verification, firms need to provide stronger evidence to support their sustainability information, which leads to greater disclosure about their monitoring and assessment, record keeping, validation, and accountability processes. This more robust form of verification is independent of firms' financial relationships and the notable conflicts that exist between process-focused verifiers and their clients. For these reasons, we suggest that firms that use content-focused verification are more likely to disclose a greater quantity of ESG information than firms that pursue process-focused verification.

Hypothesis 3. Compared to firms that follow ESG guidelines and pursue process-focused verification, firms that follow ESG reporting guidelines and pursue content-focused verification are more likely to disclose a greater quantity of sustainability information.

3 | METHODS

To test our hypotheses, we needed to examine a unique ESG reporting setting that endorses both process- and content-focused verification. The Japanese EPA's reporting guidelines did so during the critical time between 2001 and 2005. To our knowledge, the Japanese reporting guideline is the only example globally of an ESG



reporting standard that created the option for firms to choose whether to use either process- or content-focused third party verification. By contrast, the designers of the five most widely used ESG reporting frameworks (Global Reporting Initiative, Sustainability Accounting Standards Board, Carbon Disclosure Project, International Integrated Reporting Council, and Carbon Disclosure Standards Board) have only promoted process-focused verification. This unusual historical context creates the possibility of a natural experiment that compares outcomes of process- and content-focused verifications in a consistent manner while controlling for the country-level regulatory and socio-economic concerns. After 2005, Japan removed the options for both content- and process-focused verification and, like the other internationally recognized ESG reporting frameworks, only emphasized process-focused verification. For these reasons, we focus on the highly unique setting of Japan, which developed its own sustainable reporting guidelines in 2001 and, until 2005, offered firms the option of pursuing either process- or content-focused verification.

The Japanese EPA developed Japan's ESG reporting guidelines in coordination with academics, think tank researchers, lawyers, and environmental managers of manufacturing and construction companies whose products or production processes had significant environmental impacts. The guidelines considered the information needs of investors who would use environmental reporting within the ESG reporting framework, by requiring reporting of conventional environmental management information and forward-looking non-financial data, including the soundness of the organization structure and strategic direction (Ministry of Environment, 2018). Japan's guidelines emphasized certainty and uniformity in what information firms should report. To enhance comparability and clarity, the guidelines standardized firms' reporting criteria by stating what should be included in each company's environmental report (e.g., related to climate change, water resources, biodiversity, resource circulation, chemical substances, and pollution prevention) and suggested specific indicators, including activities for reducing environmental impacts (Tanaka, 2015).

At the time of their development, Japanese firms were encouraged to follow EPA's guidelines for disclosing their sustainability information (Tanaka, 2015). However, beginning in 2006, GRI became increasingly popular once it launched its G3 guidelines (Tanaka, 2015). After that point, most firms that had followed Japan's Environmental Reporting Guidelines, also began following G3. Today, Japan's reporting guidelines closely resemble GRI's guidelines (Tanaka, 2015).

By leveraging Japan's unique historical setting between 2001 in 2005, we undertake a natural experiment that enables us to examine the impact of reporting guidelines and different types of verification on firms' sustainability information disclosure. We focus on manufacturing firms listed on the 1st Tokyo Stock Market that published sustainability reports in 2005. We collected these firms' sustainability reports using the Database of Social/Environmental Reports (DSER), which is the most widely recognized listing of Japanese firms that had publicly disclosed their social and environmental reports. In 2005, the DSER included sustainability reports for 319 Japanese manufacturing firms. After adjusting for missing data among our other variables, 187 reports were included in our evaluation. We focus

specifically on environmental disclosures because this was the primary focus of the Japanese guidelines.

3.1 | Variables of interest

3.1.1 | Use of ESG reporting guidelines

To measure a firm's use of the Japanese EPA's sustainability reporting guidelines, we draw on information contained on the Database of Social/Environmental Reports website. The database indicates whether each firm had followed the EPA reporting guidelines in 2005 (coded 1; 0 otherwise).

3.1.2 | Information quantity

To measure the quantity of firms' environmental information disclosure, we created two measures: (1) the number of pages (logged) comprising each firm's environmental report and (2) the number of words (logged) in each environmental report. The number of pages (logged) accounts for the overall amount of environmental information contained in each firm's sustainability report, including texts, pictures, and tables. As a typical measure of information quantity includes numbers of words (de Sola Pool, 1983), we consider that reports with more words are more likely to present a substantive discussion regarding firms' environmental activities. A smaller number of firms (41) submitted sustainability reports that included information related to non-environmental issues, such as fair trade or local economic development. The smaller emphasis on non-environmental sustainability issues is most likely since the Japanese guidelines were designed around environmental reporting within the ESG reporting framework. In instances where firms reported on a broader range of ESG concerns, we focused only on the chapters that related specifically to firms' environmental activities, but accounted for whether this broader range of information was provided.

To count the number of words, each PDF report was converted into an MS Word document. We then summed the number of words related to each firm's environmental activities. In instances where only a printed report could be obtained, we manually counted the words related to each firm's environmental activities. We only assessed chapters within each report that dealt with the firm's environmental activities. Words that were included in pictures or tables were added to each firm's total count.

3.1.3 | Information credibility

To measure the credibility of firms' disclosed information, we accounted for whether or not firms chose to have their sustainability reports undergo the third party verification by an independent body. Japanese companies had two options for third party verification: (1) process-focused verification in which professional auditing

companies certified the reports' rule conformance and (2) content-focused verification in which NGOs and academic scholars verified the integrity of disclosed information and provided evaluative comments. The process-focused verification is coded 1 if the sustainability report is assured by the auditing companies and 0 otherwise. Content-focused verification is coded 1 if the report is assured by the NGOs or academic scholars and 0 otherwise.

3.2 | Control variables

Previous scholars have found evidence of a positive relationship between companies' environmental performance and their compulsory environmental disclosure in annual financial reports (Cho & Patten, 2007). Anticipating that a similar relationship might exist between a firm's environmental performance and their voluntary environmental disclosure, we obtained data for firms' toxic chemical releases and transfers included in Japan's Pollutant Release and Transfer Register (PRTR). In 2001, Japanese facilities with more than 21 full-time employees first began estimating the amount of 354 toxic chemical substances that they released into the environment. In 2002, EPA began publicly reporting this information, with the first aggregate data being published in 2003. Since a firm's previous year's environmental performance is likely related to its decisions to publicly report environmental information, we aggregated each firm's facility-level PRTR data for 2004.

Recognizing that some PRTR chemicals are extremely harmful on human health, while others are less harmful, we weighted the data using the Organization for Research and Communication on Environmental Risk of Chemicals' health toxicity rating index for PRTR chemicals (Nakamura et al., 2008). ORCERC evaluates the toxicity of chemicals based on their aerial and aquatic impacts. Since ratings were less widely available for aquatic toxicity, we relied on ORCERC weighting coefficients of aerial impacts and aggregated facility reporting data to the firm level. Following Clarkson et al.'s (2008) suggestion, firms' weighted toxicity values were adjusted for production levels by accounting for their gross sales. Our final variable, therefore, was firms' weighted 2004 toxic emissions. To account for the firm's level of production, we divided this variable by the firm's total sales.

To control for the fact that a firm's current disclosure of environmental information may be related to its earlier experience with information disclosure, we account for firms' environmental reporting experiences by determining the first year of environmental disclosure and subtracting it from 2005. Thus, a firm that first published its environmental report in 1995 would have 10 years of environmental reporting experience.

Other factors that may affect firms' voluntary environmental disclosure relate to whether or not a company takes a more expansive view of environmental disclosure. Previous anecdotal research suggests that sustainability reports that also contain social information may contain less information related to the environment than a classic environmental report (Kozuma, 2007), even though the length of the report may be greater. The rationale is that companies which are

developing broader sustainability reports that include social information are publicly disclosing information about their environmental issues, in addition to other concerns related to fair trade, economic development and other social concerns. Under these circumstances, rather than producing a longer report with more detailed environmental information, firms may be more likely to restrict some environmental information within a report of the same length. We controlled for whether firms produced a sustainability report that includes both environmental and social issues or only environmental issues (coded 1; 0, respectively) by obtaining this information from the Database of Social/Environmental Reports.

Firms that have greater access to resources may be more likely to assess their environmental activities to a greater degree than firms that have fewer resources (Nakamura et al., 2001). Consequently, they may be in a better position to provide more extensive and credible information about their environmental activities. We accounted for firms' access to financial resources by relying on the Nikkei Economic Electronic Databank System to obtain their pretax 2004 profit adjusted for production levels (sales). The Nikkei Economic Electronic Databank System contains corporate attribute data for approximately 30,000 publicly traded Japanese companies.

By allocating resources toward environmental research and development (R&D), organizations demonstrate a managerial commitment for environmental innovation. They also exhibit an organizational culture for proactively managing their environmental impacts and a capacity to follow through in addressing their environmental concerns (Nakamura et al., 2001). Each of these factors may lead to greater operational commitments to seek external legitimacy for their efforts by way of voluntarily disclosing information about their proactive environmental activities. The degree of firm innovativeness is measured by using R&D expenditures per unit sales. These data were obtained from the Nikkei Economic Electronic Databank System.

Dummy variables were used to account for firms' manufacturing sector. The excluded sector dummy is the electric power, gas, and other products sector. Table 2 describes the variable correlations, distributions, and descriptives. Of the 187 firms in our sample, a total of 149 firms followed the Japanese reporting guidelines (i.e., our treatment group). Of these, 45 firms pursued process-focused verification and 36 firms pursued content-focused verification.

3.3 | Analytic methods

To test Hypotheses 1 and 2, we estimate the relationship between reporting guidelines and firms' information quantity and credibility. In assessing this relationship, an important issue for us to address is that firms' decisions about whether to follow the EPA reporting guidelines are likely to be endogenous to their information disclosure performance. In other words, unobserved factors may lead to these firms choosing to follow reporting guidelines and are also likely to influence the quantity and credibility of information disclosed. To adjust for the effect of non-random assignment, we rely on propensity score



TABLE 2 Correlations and descriptive statistics

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	
1 Weighted toxic releases	1.00													
2 Years of public reporting	0.02	1.00												
3 Report includes social impacts	0.05	0.23	1.00											
4 Profit/Sales	0.10	0.07	0.09	1.00										
5 R&D expenditures/sales	-0.09	-0.15	-0.02	0.34	1.00									
6 Ceramic, iron & metal products	0.10	-0.15	-0.02	0.03	-0.14	1.00								
7 Chemical, oil, coal, medical & rubber products	0.15	-0.02	0.03	0.23	0.31	-0.20	1.00							
8 Construction	-0.18	-0.04	0.02	-0.16	-0.20	-0.07	-0.12	1.00						
9 Electric products	-0.25	-0.03	-0.07	-0.06	0.34	-0.14	-0.23	-0.09	1.00					
10 Food & agriculture products	-0.05	-0.03	0.02	-0.12	-0.21	-0.11	-0.17	-0.06	-0.13	1.00				
11 Non-metal products & machinery	0.06	0.01	-0.02	-0.07	-0.08	-0.11	-0.17	-0.06	-0.13	-0.09	1.00			
12 Pulp, paper & textile products	0.18	-0.12	0.07	0.02	-0.12	-0.09	-0.15	-0.06	-0.11	-0.08	-0.08	1.00		
13 Transport & precision products	0.07	-0.10	-0.08	-0.13	0.04	-0.13	-0.21	-0.08	-0.15	-0.11	-0.11	-0.10	1.00	
Total sample <i>n</i> = 187	Mean	18.39	5.80	0.22	0.06	0.03	0.11	0.25	0.04	0.14	0.09	0.09	0.06	0.12
Standard Deviation	6.35	2.13	0.41	0.04	0.03	0.31	0.43	0.20	0.35	0.28	0.28	0.25	0.33	0.33
Follow guidelines <i>n</i> = 149	Mean	18.37	5.70	0.25	0.06	0.03	0.11	0.23	0.05	0.15	0.09	0.08	0.05	0.13
Standard Deviation	6.50	2.10	0.43	0.04	0.03	0.32	0.43	0.21	0.36	0.28	0.27	0.23	0.33	0.33
Do not follow guidelines <i>n</i> = 38	Mean	18.46	6.18	0.11	0.06	0.02	0.08	0.29	0.03	0.13	0.08	0.11	0.11	0.11
Standard Deviation	5.85	2.23	0.31	0.04	0.02	0.27	0.46	0.16	0.34	0.27	0.31	0.31	0.31	0.31

Note: Correlations (absolute value) greater than 0.14 (0.19) are significant at the 5% (1%) level.

matching, which is a method that assesses treatment effects and reduces self-selection bias.

Let EPA_i be i th company's selection result for the EPA reporting guidelines. When the company follows the guidelines, the quantity of information disclosure is written as $QNT1_i$, otherwise $QNT0_i$. Assuming that the firm's decision to follow the EPA reporting guidelines is independent of the quantity (i.e., $QNT1_i, QNT0_i \perp EPA_i | X_i$), then the average treatment effect (ATE) of the firms' decision on the quantity is expressed as follows:

$$ATE = 1N_i E_{X_i, EPA_i = 1} - E_{X_i, EPA_i = 0} \quad (1)$$

where N is the number of observations. The vector X_i is for i th company's characteristics is potentially associated with their environmental activities. If i th company follows the reporting guidelines (i.e., $EPA_i = 1$), we can observe i th company's information quantity (i.e., $QNT1_i$) but cannot observe counterfactual quantity (i.e., $QNT0_i$). Therefore, it is necessary to manage to complement counterfactual observations.

Propensity score matching helps address the fundamental problem of identifying causal effects by helping construct unobservable counterfactuals for treated observations. The procedure is as follows. First, $p(X_i)$ is defined as i th company's propensity score that a firm follows the Japanese EPA reporting guidelines. This score is used as a criterion to find counterfactual observations among all of the observations.

$$p(X_i) = P(EPA_i = 1 | X_i) \quad (2)$$

The propensity score can be estimated by logit or probit model because EPA is a binary variable. This study employs a logit model for the estimation. Second, given that i th company follows the guideline, we find one or more companies which do not follow the guideline and have same/similar propensity scores with i th company. That is, observed j th company's situation, $QNT0_j | X_j, EPA_j = 0$, is regarded as unobserved i th company's counterfactual, $QNT0_i | X_i, EPA_i = 0$, when company j does not follow the guideline and predicted $p(X_j)$ is same with or close to $p(X_i)$. To ensure the robustness of our matching procedure, we estimate the average treatment effects using three sets of matched observations: one-to-one, one-to-three, and one-to-five matches. In the case of adopting multiple counterfactuals, we weight them (Cameron & Trivedi, 2005) and use the command, *teffects psmatch* in STATA 14.

To test Hypothesis 3, we use linear regression to assess how different verifications are related to the information quantity that firms disclose in their environmental reports. More specifically, we use the number of pages and words as a function of the content-focused verification compared to the process-focused verification that serves as a reference group. We analyze firms that follow reporting guidelines and obtain third party verifications only ($n = 81$) so that we can compare firms' information disclosure between verification types within the same reporting framework. The same control variables that were used to assess Hypotheses 1 and 2 are included in this regression model as well.

4 | RESULTS

Table 3 shows the logit analysis results for the propensity score. The value of chi-square is 21.18, implying that the estimation model is valid. The negative and significant coefficient of years of public reporting means that firms with longer publishing terms were less likely to follow the reporting guidelines. Firms which published sustainability reports that include both environmental and social impacts rather than just environmental impacts and had higher ratios of R&D expenditures to sales were more likely to follow the guidelines. As for the other industry dummy variables, the coefficients for the chemical, electric, non-metal and pulp products industries are significantly negative, suggesting that firms belonging to these industries are less likely to follow reporting guidelines compared to firms in the electric power, gas and other products sector.

We illustrate the distributions of the predicted scores before and after the propensity match in Figure 2, where the number of matches is 1. The distribution is drawn as a kernel function. Before matching observations, we find the different peaks of the propensity scores between treatment and control groups (i.e., top figure). In contrast, the same peaks are found between them after matching observations (i.e., bottom figure), suggesting that the matching can control for self-selection bias. Similar results are found even when using a different number of matches per observation (one-to-three, one-to-five). Therefore, we confirm that the matching procedure appears valid.

Using the matched observations, we calculate the average treatment effects on the four outcomes: number of pages (logged), number of words (logged), and two types of verifications. The estimation

TABLE 3 Logit analysis results for propensity score

Variable	Coef.	SE
Weighted toxic release (logged)	0.03	(0.04)
Years of public reporting	-0.29**	(0.12)
Report includes social impacts	1.59**	(0.64)
Profit/Sales	-1.66	(6.08)
R&D expenditures/sales	34.00**	(14.32)
Ceramic, iron & metal products	-1.38	(1.11)
Chemical, oil, coal, medial & rubber products	-2.47**	(1.00)
Construction	-0.39	(1.39)
Electric products	-2.38**	(1.20)
Food & agriculture products	-1.15	(1.06)
Non-metal products & machinery	-1.96*	(1.07)
Pulp, paper & textile products	-2.82**	(1.18)
Transport & precision products	-1.83	(1.12)
Constant	3.26**	(1.38)
Log likelihood	-83.81	
LR Chi-squared (p -value)	21.18	(0.07)
Pseudo R -squared	0.11	

Note: Robust standard errors in parentheses. $N = 187$. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

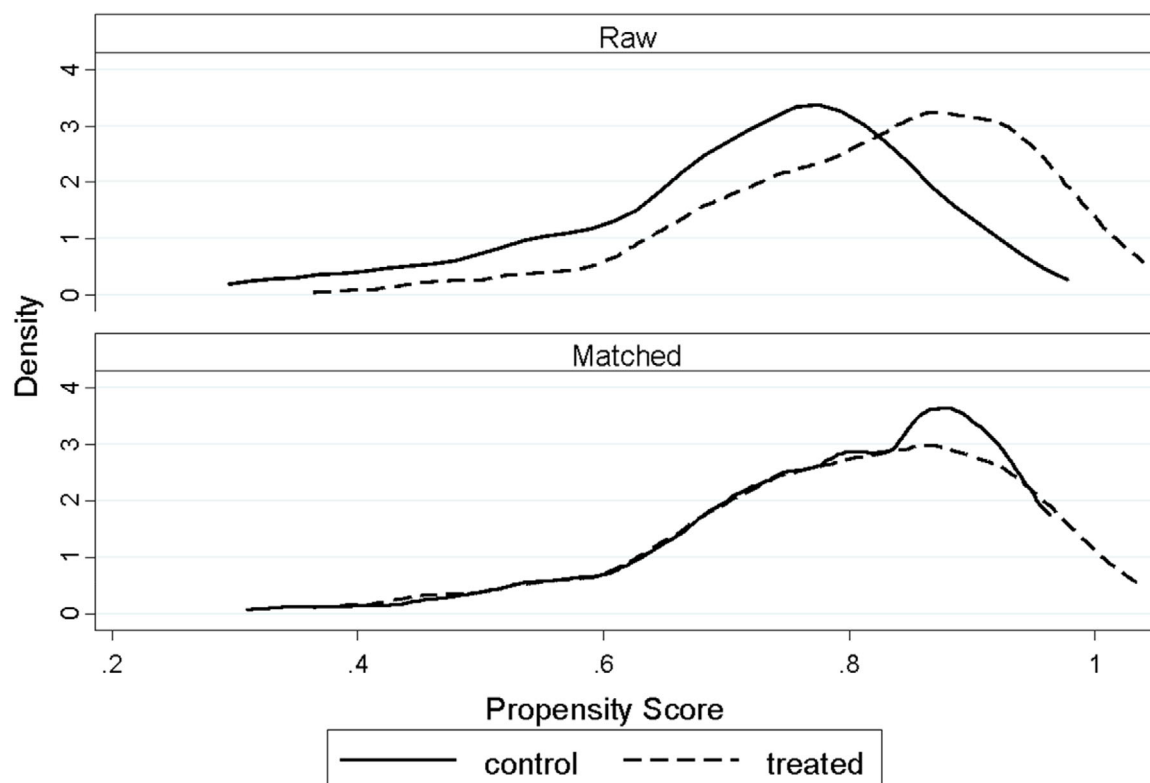


FIGURE 2 Balance plot of propensity score in the case that number of matches per observation is 1 [Colour figure can be viewed at wileyonlinelibrary.com]

TABLE 4 Results for average treatment effects

Average treatment effects	# of pages (logged)		# of words (logged)		Content-focused verification		Process-focused verification	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
# of matches per observation: 1	0.14	0.12	0.33	0.06***	0.14	0.05***	-0.02	0.17
# of matches per observation: 3	0.20	0.03***	0.37	0.06***	0.11	0.06*	0.07	0.06
# of matches per observation: 5	0.19	0.05***	0.33	0.08***	0.11	0.05**	0.06	0.06

Note: Robust Abadie-Imbens standard errors are used. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

results are shown in Table 4. Coefficients (Coef.) and standard errors (SE) of the EPA reporting guideline are presented for each outcome variable across different matching scenarios. The coefficients indicate the average treatment effects of the reporting guidelines and are the estimated differences in the expected outcome values between the firms which followed the guidelines and the firms that did not follow them. The first and second columns in Table 4 describe the results of average treatment effects of the EPA reporting guidelines on the number of pages (logged) and the number of words (logged) included in companies' environmental reports, respectively. The third and fourth columns describe the results of the average treatment effects on each type of external verification. The second and third rows report results on the same outcome measures, while using different sets of observations matched one-to-three and one-to-five respectively.

In evaluating the relationship between reporting guidelines and the quantity of environmental information that firms disclose, using

the one-to-one match, we find that coefficients associated with firms following the EPA guidelines are 0.14 for the number of pages (logged) and 0.33 for the number of words (logged). The positive coefficients indicate that firms that follow the EPA guidelines are more likely to include a greater quantity of environmental information in their sustainability reports than firms that did not follow the EPA reporting guidelines, but still published a sustainability report. To identify the actual increase in the number of pages and words, we exponentiated the coefficient (e.g., $\exp(\text{Coef.})$) because the number of words and pages are logged. After doing so, we determine that firms which follow the EPA guidelines, on average, included 15% more pages ($\exp[0.14] = 1.15$) and 39% more words ($\exp[0.33] = 1.39$) in their environmental reports compared to firms that do not follow the guidelines, but still published a sustainability report. These findings are statistically significant at the 1% level for the number of words (logged), although not significant for the number of pages (logged).

TABLE 5 Regression results assessing the type of verification firms use and the quantity of information they report

Variable	# of pages (logged)		# of words (logged)	
	Coef.	SE	Coef.	SE
Content-focused verification	0.18	(0.11)	0.21**	(0.10)
Weighted toxic release (logged)	0.022**	(0.01)	0.027***	(0.01)
Years of public reporting	0.071**	(0.03)	0.08***	(0.03)
Report includes social impacts	−0.33***	(0.11)	−0.29***	(0.11)
Profit/Sales	1.98	(1.34)	1.89	(1.20)
R&D expenditures/sales	−1.66	(1.94)	−0.45	(1.85)
Ceramic, iron & metal products	0.18	(0.25)	−0.04	(0.25)
Chemical, oil, coal, medial & rubber products	−0.13	(0.21)	−0.24	(0.19)
Construction	0.21	(0.29)	0.32	(0.19)
Electric products	0.17	(0.22)	0.19	(0.21)
Food & agriculture products	−0.22	(0.19)	−0.37**	(0.17)
Non-metal products & machinery	−0.12	(0.22)	−0.16	(0.18)
Pulp, paper & textile products	−0.14	(0.28)	−0.15	(0.31)
Transport & precision products	0.19	(0.24)	0.15	(0.19)
Constant	2.12***	(0.37)	9.15***	(0.33)
Adj. R-squared	0.23		0.28	
F value	4.92***		4.72***	
Observations	81		81	

Note: Robust standard errors in parentheses. $N = 81$. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

However, when we estimate the average treatment effects using one-to-three and one-to-five matches (as shown in rows 2 and 3, columns 2 and 4), the positive coefficients associated with firms which followed the EPA reporting guidelines become significant even for the number of pages (logged). These results imply that firms which followed the EPA reporting guidelines were likely to publish reports with 20%–22% more pages (i.e., $\exp(0.19) - \exp(0.20)$) and 39%–44% more words (i.e., $\exp(0.33) - \exp(0.37)$) that describe their environmental activities than firms that published a sustainability report but did not follow the Japanese reporting guidelines. These findings are statistically significant at the 1% significance level and thus support Hypothesis 1, which states that *compared to firms that do not follow ESG guidelines, firms that follow ESG reporting guidelines are more likely to disclose a greater quantity of environmental information*.

In assessing the relationship between firms' voluntary use of reporting guidelines and verification type, our findings are unexpected. In the case of the one-to-one match, the coefficient of the EPA reporting guideline for the content-focused verification is 0.14. That means, firms which followed the EPA reporting guidelines were 14% more likely to use content-focused verification, compared to firms that did not follow EPA's guidelines. These findings are statistically significant at the 1% significance level. By contrast, the coefficient of the EPA reporting guideline for the process-focused verification is −0.02, which is statistically insignificant across all significance levels, indicating that the probability of firms using process-focused verification is statistically similar to firms that did not follow EPA's guidelines. Taken together, results indicate that compared to firms that do not follow the reporting guidelines, firms that follow the

reporting guidelines show significant preferences for the use of content-focused verification but not for the use of process-focused verification. These findings are consistent across all three sets of matched observations and contradict Hypothesis 2, which states that *compared to firms that do not follow ESG guidelines, firms that follow ESG reporting guidelines are more likely to pursue process-over content-focused verification*.

To test Hypothesis 3, we assess the information quantity disclosed by firms based on their use of different verifications: content-focused verification and process-focused verification, the latter of which is our reference group. The regression results are shown in Table 5. The coefficients associated with each type of verification indicate the estimated differences in the expected number of pages (logged) and words (logged) among firms using content-focused verification type compared to firms that use process-focused verification, but still follow the reporting guidelines (the reference group). We find that firms that follow reporting guidelines and use content-focused verification of their sustainability reports publish 19% more pages ($\exp[0.18] = 1.19$) and 23% more words ($\exp[0.21] = 1.23$) in their reports than firms that use process-focused verification. These findings are statistically significant at the 5% significance level for the number of words (logged), although not significant for the number of pages (logged). These findings partially support Hypothesis 3, which states that *compared to firms that follow ESG guidelines and pursue process-focused verification, firms that follow ESG reporting guidelines and that pursue content-focused verification are more likely to disclose a greater quantity of sustainability information*.



5 | DISCUSSION

Reporting guidelines are normative and non-binding tools that define a societal goal and substantive processes that firms should follow to achieve these goals (López-Santana, 2006). They are important institutional rules that, increasingly, are shaping the legitimization of firms' ESG reporting (Shabana et al., 2017). However, questions exist about the quantity (Beretta & Bozzolan, 2004) and credibility (Michelon et al., 2015) of information contained in firms' sustainability reports, and whether different types of third party verification enhance firms' information quantity to the same extent. This issue is particularly important because global ESG reporting guidelines generally rely on process-focused verification (Morhardt et al., 2002; Threlfall et al., 2020).

We offer three important contributions to a growing body of research suggesting that ESG reporting guidelines can improve firms' information disclosure (Kouloukoui et al., 2019; Mio, 2010; Rim et al., 2019; Romolini et al., 2014; Tsang et al., 2009). First, after controlling for selection bias, we show that firms which rely on ESG reporting guidelines disclose 39% more textual information to describe their environmental sustainability activities. These findings are important because the information contained in firms' sustainability reports helps external stakeholders, and especially investors, assess firms' non-financial performance (Beretta & Bozzolan, 2004) to make more informed decisions that can reward companies with stronger sustainability agendas. Moreover, any quantifiable measure of quality first requires a quantifiable measure of information (Hilbert, 2012). Our findings show that firms which rely on ESG reporting guidelines indeed disclose more environmental information. Therefore, this study provides an important initial step needed on the pathway of assessing firms' information quality. We believe that our findings offer a strong basis to explore how variations in sustainability information quantity are related to stronger (or weaker) sustainability performance. For instance, one approach might evaluate each report's breadth and depth of sustainability information. Such an assessment may be done by sustainability experts in the field, such as environmental NGOs, or by convening focus groups of report users, including investors and consumers.

Our second contribution is that we reveal important information about firms' use of third party verification for their sustainability reports. Content- and process-focused verification represent two different institutional rules designed to increase the external credibility of firms' sustainability reports. However, prior research has not drawn clear distinctions among them, nor has it assessed the extent to which firms prefer one verification over the other. Moreover, we know little about whether the rules associated with one verification leads to greater information disclosure than the other. Our findings show that the verifications are not regarded similarly by firms and that, indeed, they are associated with different levels of information disclosure.

Contrary to our expectations, firms that follow reporting guidelines were 14% more likely to pursue content- rather than process-focused verification. These findings were unexpected because content-focused verification involves environmental NGOs and/or academic scholar(s) who are sustainability experts and who assess the

completeness, accuracy and the comprehensiveness of firms' sustainability reports and share their perspectives on the reliability of disclosed information (Kokubu & Nashioka, 2005; Michelon et al., 2015). Because of this more intensive review and the involvement of environmental NGOs and/or academics who are more likely to scrutinize companies' environmental activities, content-focused verification has a greater opportunity to expose firms' reporting inconsistencies. While greater scrutiny may be a reason for firms to stray from this more robust verification approach, our findings suggest that firms that use reporting guidelines prefer content-focused verification.

We believe that these results may be due to firms' interest in using the verification process to receive expert feedback on how to improve their environmental approaches and outcomes (Maroun, 2020; O'Dwyer, 2011). Such feedback requires that auditors have significant knowledge about sustainability (Sethi et al., 2017) and that this knowledge is applied to an intensive review and validation of the report's information quality, accuracy, and comprehensiveness (Kokubu & Nashioka, 2005). The more in-depth feedback is likely to influence managers' attitudes (Edgley et al., 2010) and help firms better respond to increased global pressures to address complex issues such as mitigating climate change and improving circularity in the value chain. These findings may offer insight regarding recent stakeholder criticisms regarding the shortcomings of traditional accounting-styled verifications in that these verifications do not make claims about the quality of firms' sustainability information (Michelon et al., 2015; O'Dwyer, 2011; Wong & Millington, 2014).

A third contribution relates to the important research questions that this study raises about the institutional rules established by different verifications and the increasingly greater emphasis on process-focused verification (Maroun, 2020; O'Dwyer, 2011; Sethi et al., 2017). Firms that undergo content-focused verification report 23% more textual information in their sustainability reports than firms that use process-focused verification. Equipped with more information, external stakeholders may be better positioned to assess firms' overall performance, which shapes their purchasing and investment decisions to reward more sustainable firms (Rhodes, 2010; Sarti et al., 2018). However, current verification trends see a movement toward process-focused verification, including those provided by the major auditing and accounting firms (Channuntapipat, 2021). Similarly, the Japanese EPA's reporting practices have also shifted in response to the greater popularity of GRI and its emphasis on process-focused verification. While there is some uncertainty about whether Japanese firms' preference for content-focused verification remains today, more generally, there is strong evidence that firms are looking for additional government guidance on aspects of ESG reporting (Beare et al., 2013). Either way, our findings offer support for the need to question trending perspectives on third party verification and include more substantive and knowledgeable opinions from independent auditors (Maroun, 2020; O'Dwyer, 2011).

The timing of this work is relevant given the merger of the Sustainability Accounting Standards Board, Carbon Disclosure Project, International Integrated Reporting Council, and Carbon Disclosure Standards Board, which is expected to be finalized in June 2022 (Cohen, 2021). The merger creates a significant opportunity for these

standards organizations and the firms that use these standards to reconsider ESG reporting and create pathways that emphasize more robust forms of verification, such as content-focused verification. Doing so can bolster the information quantity and credibility of firms' sustainability reports. It can also give additional credibility for firms' reporting, especially as these reports expand to include governance features, as is increasingly the case for ESG reporting.

Creating more substantive roles for independent verifiers also has value to firms. Firms that wish to appeal to sustainability-minded stakeholders are using reporting and standards as a means to legitimize their sustainability practices. One motivation is that stakeholders view self-declarations with skepticism (Heras-Saizarbitoria et al., 2020; Siegel, 2009), especially those made in the absence of a transparent sustainability framework (Darnall, Ji & Vazquez-Brust, 2018). In response, stakeholders tend to reward "virtuous" firms in the marketplace (Doh et al., 2010). Given that the top five ESG reporting standards emphasize process-focused verification, firms that wish to go further with their ESG reporting have no pathway to do so. These firms should be working actively with the designers of existing ESG reporting standards to create opportunities for distinction that comes with superior performance and disclosure. Content-focused verification may be one important means of doing so.

Prospective research should investigate the extent to which different ESG reporting verifications might help firms improve their actual sustainability performance over time. Given the scrutiny that comes with content-focused verification, one might hypothesize that firms that use this type of verification may benefit from greater sustainability performance outcomes over time. However, future research should examine this.

The results of such a study also inform the increasing institutionalization of ESG reporting standards and the greater emphasis on process-focused verification (Maroun, 2020; O'Dwyer, 2011; Sethi et al., 2017). Indeed, the five most widely used ESG reporting guidelines globally—GRI, Sustainability Accounting Standards Board, Carbon Disclosure Project, International Integrated Reporting Council, and Carbon Disclosure Standards Board (Threlfall et al., 2020)—all rely on process-focused verification. As ESG reporting becomes more integrated into firms' traditional accounting and financials (World Economic Forum, 2020), content-focused verification is likely to become less common. A study that assesses whether different types of verification are related to firms' sustainability performance may shed light on whether the current focus on process-focused verification is appropriate.

One limitation of this research may relate to our sample being limited to Japanese firms in 2005. At that time, Japanese firms were at the forefront of environmental information disclosure, and this remains the case today globally as 31% of Japanese firms engage in ESG reporting compared to 19% of North American and 11% of European firms (Schrader, 2019). Because of Japan's leadership in ESG reporting, this study is advantaged by including a larger proportional cross-section of firms from a single country-setting that are also at the cutting edge of ESG reporting. The single-country focus also enabled us to control for the thorny methodological concerns associated with differences in regulatory and socio-economic settings.

Where the Japanese setting tends to differ from other leading ESG reporting countries seen today is Japan's greater emphasis on environmental aspects of ESG over the social aspects of ESG (Cremers et al., 2021). This is an important reason why this study focuses on firms' environmental disclosures only, although it is also a limitation of this research.

Future research would benefit from examining how firms' disclosure of social information differs based on the design of different reporting standards. Although, we have no theoretical reason to believe that our findings would differ if we included firms' disclosures of social information, there are many design features associated with reporting standards that are worth considering, such as their specificity, breadth, and depth. Our hope is that this study can serve as a basis for undertaking this future research as there is still much to learn about how ESG reporting guidelines influence firms' information disclosure. For instance, the European Union's EU Directive 2014/95/EU on social and environmental information disclosure creates an opportunity for comparative research across other aspects of ESG reporting even if the EU directive endorses the process-focused verification only (Caputo & Pizzi, 2019). Indeed, scholars have begun to assess how firms' information disclosure changed after the national transposition of the directive. However, most analyses are conducted in a single country context (Caputo et al., 2020; Hoffmann et al., 2018; Raucci & Tarquinio, 2020) due to difficulties in controlling for different legal and institutional contexts across countries (Venturelli et al., 2018).

6 | CONCLUSION

In sum, drawing on Japan's unique sustainability reporting setting, we determine that firms that follow ESG reporting guidelines are more likely to disclose a greater quantity of sustainability information. Moreover, if given the option, firms prefer to verify their sustainability reports with a more robust type of third party verification (content-focused) and this form of verification is related to firms' greater quantity of environmental information disclosure than process-focused verifications. However, the five most widely used ESG reporting guidelines globally all emphasize process-focused verifications, as do most national governments that endorse ESG reporting (e.g., European Union, 2014). These findings offer important insights about current trends toward ESG reporting consolidation and their reliance on verification strategies which are not associated with greater information disclosure. Firms that wish to go further with their ESG reporting should consider partnering with the developers of ESG reporting guidelines to create opportunities for distinction that come with superior performance and disclosure.

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