Do voluntary disclosure standards work? Evidence from the GRI in the extractive sector

by

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Abstract

The Global Reporting Initiative (GRI) is the most commonly adopted voluntary standard for environmental, social, and governance (ESG) disclosures. Yet, notably, claims of GRI adoption are not subject to any mandatory enforcement mechanisms. Thus, I investigate whether the GRI is an effective standard—whether firms which claim to adopt the GRI demonstrate stronger ESG disclosure quality and ESG performance. The results indicate that GRI adoption is positively associated with disclosure quality, consistent with signaling theory. The results also indicate that GRI adoption is positively associated with ESG performance through its effect on disclosure quality. I find further evidence of compliance as more stringent levels of GRI application are associated with higher disclosure quality. The results also show a positive relationship between GRI adoption and the presence of ESG disclosure committee and ESG assurance, yet the three mechanisms are independent indicators of disclosure quality. Overall, these findings suggest that in a competitive standard-setting environment of nonfinancial disclosures, the most popular standard provides a credible, independent signal of disclosure quality.

Acknowledgments

A dissertation, while a student's independent and original work, is nevertheless a communal effort: as every student stands on the proverbial shoulders of giants, they are propped up by the emotional, spiritual, and practical support of their friends, family, and others. There are many people who have supported me in different ways and to whom I am very thankful.

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Chapter 1: Introduction

The Global Reporting Initiative (GRI) is a voluntary disclosure standard for corporate disclosures of environmental, social, and governance (ESG) information. It is by far the most commonly adopted standard for ESG disclosures, claimed by over 47% of the top 4,900 corporations in a global sample, and 70% of the largest 250 corporations in the world (KPMG, 2017). Yet these claims of GRI adoption are not subject to any mandatory enforcement or verification. The popularity of the standard and the absence of formal enforcement raises the question of whether the GRI is effective—whether firms that claim to adopt the GRI demonstrate stronger ESG disclosure quality and ESG performance—or whether this voluntary standard is a form of greenwashing, whereby firms claim GRI adoption as a public relations exercise regardless of their actual disclosure and operating practices.

Investigating the efficacy of the GRI is important because the setting of GRI adoption can be contrasted with financial accounting standards. In North America, adoption of the GRI framework (or any other ESG disclosure standard) is voluntary and not subject to any mandatory enforcement. In contrast, the financial accounting standards are required to be adopted, are mandated to be audited, and are enforced by securities regulators. Given the significant resources dedicated to the process of accounting standard setting and enforcement, an essential question in the field of financial accounting is whether the current approach of mandatory accounting standards is necessary or better than alternatives (Beyer et al., 2010; Dye, 1990; Jamal et al., 2003; Sunder, 2010). By examining the efficacy of the GRI, I provide evidence on efficacy of voluntary disclosure standards as an alternative approach to disclosure.

To investigate the effectiveness of the GRI voluntary standard, I examine whether GRI adoption is associated with ESG disclosure quality and ESG performance in a sample of

Canadian and U.S. firms in the extractive sector over the 2009–2018 time period. I collect data on GRI adoption from the Corporate Register and GRI's Sustainability Disclosure Database; I use Thomson Reuters ASSET4 ESG Scores as a measure of ESG performance and Bloomberg ESG Disclosure Scores as a measure of ESG disclosure quality.

According to signaling theory (Connelly et al., 2011; Spence, 1973), a voluntary disclosure standard can be considered effective if firms can use its adoption to signal their high type, thereby predicting a positive association between GRI adoption and ESG disclosure quality, as well as between GRI adoption and ESG performance. As a *disclosure* standard, the GRI should be considered effective primarily if its adoption indicates higher ESG disclosure quality. A secondary approach to evaluating disclosure standard effectiveness is whether the standard indicates stronger ESG performance (see, for example, Fung et al., 2007). In contrast to signaling theory, legitimacy theory predicts a negative association between GRI adoption and disclosure quality and performance because weak ESG performers may use GRI adoption symbolically to improve their public image (Clarkson et al., 2008; Mahoney et al., 2013; Michelon et al., 2015; Patten, 1991). Given that the GRI does not require any formal enforcement, firms could claim GRI adoption regardless of their disclosure and operating practices.

Also, compared to financial accounting standards, which set a common minimum standard for disclosures, the GRI allows for several levels of framework application. If the GRI is effective, then firms should be complying with different application level requirements, and more stringent levels of GRI application should be positively associated with disclosure quality (and performance). Lastly, I examine whether GRI adoption is a direct indicator of disclosure quality or whether it is an indicator of governance mechanisms which, according to the literature,

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indicate disclosure quality (Casey & Grenier, 2015; Eccles et al., 2014; Peters & Romi, 2014; Simnett et al., 2009; Tamimi & Sebastianelli, 2017). The GRI would be most informative to the users if GRI adoption indicated disclosure quality directly, or independently of the presence of other governance mechanisms associated with disclosure quality.

The findings on the relationship between GRI and disclosure quality are strong and consistent with signaling theory, demonstrating that GRI adoption is associated with higher ESG disclosure quality even after controlling for ESG performance. I also find evidence of firm compliance as adoption of more stringent levels of GRI application is associated with more transparent ESG disclosures. However, the relationship between GRI and performance is difficult to untangle because most firms that adopt the GRI demonstrate both superior disclosure quality and performance. I find that a strong positive association between GRI adoption and ESG performance is driven by the positive relationship between GRI adoption and disclosure quality. Moreover, when controlling for disclosure quality, GRI adoption is negatively associated with performance. This result appears to be inconsistent with both signaling theory and legitimacy theory because, according to the data, GRI adoption is predominantly claimed by firms with above-average disclosure and performance. In supplemental analysis I find that the pattern of results for GRI adoption holds for the adoption of U.N. Global Compact framework but not for U.N. Sustainable Development Goals framework.

Examining the relationship between GRI adoption and governance mechanisms which indicate ESG commitment, I find that GRI adoption (and disclosure quality) is indicated by the presence of an ESG committee and ESG assurance. Notably, GRI adoption, the presence of an ESG committee, and ESG assurance are all incrementally and independently associated with

higher disclosure quality. Overall, the results show that GRI adoption is a direct and independent indicator of ESG disclosure quality.

This study contributes to the existing research on the efficacy of the GRI, which has yielded mixed results. In particular, Michelon et al. (2015) provide some evidence that GRI adoption is not associated with higher quality of environmental and social disclosures, and Mahoney et al. (2013) provide evidence that GRI adoption is positively associated with stronger CSR performance. This inconsistency is surprising because the GRI is concerned primarily with disclosure rather than performance, and because firms with stronger ESG performance tend to disclose more ESG information (Eccles et al., 2014). I contribute to this literature by investigating the joint relationships between GRI adoption, ESG disclosure quality, and ESG performance. After controlling for the interdependence between ESG disclosure and performance (i.e., endogeneity), I provide evidence that GRI adoption indicates disclosure quality incrementally to other governance mechanisms (in contrast to Michelon et al., 2015), and that the positive relationship between GRI adoption and ESG performance is driven by disclosure quality (extending Mahoney et al., 2013).

By contributing to the debate on the effectiveness of alternative approaches to mandatory accounting disclosures (Beyer et al., 2010; Dye, 1990; Jamal et al., 2003; Leuz & Wysocki, 2016; Sunder, 2010), this study may be of interest to regulators. Consistent with prior research (e.g., Jamal et al., 2003), this study demonstrates the efficacy of voluntary standards. The results indicate that, in a competitive standard-setting environment, voluntary adoption of the most popular disclosure standard is a direct and incremental signal of higher disclosure quality. Moreover, the results indicate that firms comply with the different application level requirements even without mandatory enforcement.

This study also contributes to the literature concerned with investigating indicators of ESG disclosure quality and ESG performance (Clarkson et al., 2013; Hahn & Kühnen, 2013; Johnson & Greening, 1999; Wu, 2006). As a number of studies have used GRI adoption as a proxy for ESG disclosure quality (e.g., Rezaee & Tuo, 2019), this study provides evidence that this proxy is valid. My results may also be of interest to capital market participants, such as retail investors, and other users who are concerned with identifying stronger and weaker ESG performers. With a growing supply of ESG disclosures, users find it difficult to distinguish material information (Ceres, 2018; EY, 2017; Eccles et al., 2012), and my findings indicate that GRI adoption is a credible and independent signal of ESG disclosure quality. Importantly, as corporate claims of GRI adoption are public and easily accessible to users, GRI adoption possesses high signal observability, making it a useful indicator of disclosure quality (Connelly et al., 2011).

The remainder of the paper proceeds as follows. I review the literature and develop hypotheses in section 2. I describe the data in section 3, and present data analysis and results in section 4. I present results of an extension to other frameworks in section 5, before concluding in section 6.

Chapter 2: Literature review and hypothesis development

Financial accounting has become increasingly regulated over the decades. Given the significant resources spent on regulatory processes and enforcement, some researchers have questioned the mandatory approach to disclosure of financial information (Beyer et al., 2010; Dye, 1990; Jamal et al., 2003; Leuz & Wysocki, 2016; Sunder, 2010; cf. Okcabol & Tinker, 1993). For example, Leuz and Wysocki (2016, p. 599), in their review of disclosure regulation, noted that "much of the literature in accounting, economics, and finance points out that the need

for and the (net) benefits of regulation are not self-evident." In articulating an alternative approach to disclosure regulation, Sunder (2010) argued for greater reliance on social norms than on formal standards, and Dye and Sunder (2001) outlined the benefits of competition in standard setting. Just this type of a competitive environment for standard setting can be observed with respect to voluntary disclosure of nonfinancial ESG information, allowing researchers to investigate whether a less-regulated approach to disclosure can be effective.[1]

The supply of ESG disclosures has grown significantly over the last couple of decades, with firms increasingly issuing stand-alone CSR reports and incorporating ESG information into annual reports. According to KPMG (2017), ESG reporting rates for a global sample of 4,900 firms increased from 12% in 1993 to 75% in 2017, with 60% of the reporting firms including some ESG information in their annual reports. Thus, although ESG disclosures increasingly accompany traditional financial disclosures, they are not subject to mandatory standards the way financial disclosures are.[2] Yet, ESG disclosures are similar to financial disclosures because the preparers face a growing pressure to increase the comparability of ESG information across firms and time (e.g., EY, 2017). Along with the growing supply of ESG disclosures, a number of voluntary frameworks have emerged over the last couple of decades to provide firms with ESG disclosure guidance. Currently, some of the more popularized frameworks include the U.N. Global Compact, OECD Guidelines, SASB (Sustainability Accounting Standards Board) Standards, and IIRC (International Integrated Reporting Council) Integrated Reporting; however, as already mentioned, the GRI has emerged as the most widely adopted. For example, the KPMG

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[1] Similarly, the competitive market for assurance of ESG disclosures contrasts with the regulated assurance market for financial statements, thus presenting novel research opportunities (for a review, see Cohen & Simnett, 2015).
[2] Although some of the information found in ESG disclosures must be reported elsewhere (for example, in the Toxic Release Inventory in the U.S.), in the U.S. and Canada, ESG disclosures themselves, generally, are not subject to regulation (e.g., Huang & Watson, 2015; although see Schneider et al., 2018).

(2017) survey revealed that while 63% of reporting firms (in a global sample of 4,900 firms) had adopted the GRI framework, only 13% adopted stock exchange guidelines.

The GRI rose to prominence over a short period of time from modest origins (see Brown, de Jong, & Lessidrenska, 2009; Brown, de Jong, & Levy, 2009). From the beginning, the GRI was modeled after FASB in an effort to harmonize numerous reporting systems (Brown, de Jong, & Levy, 2009). The initiative was launched in 1997 by Ceres (a Coalition for Environmentally Responsible Economies, which is a U.S. non-profit organization established by leading social investors, environmental and religious organizations, public pension trustees, and public interest groups following the *Exxon Valdez* 1989 oil spill (Smith, 1993)) and was soon joined by the U.N. Environment Programme (UNEP) (GRI, 2020b). In the following several years, the GRI established a multi-stakeholder Steering Committee to develop guidance; became an independent non-profit institution; moved its headquarters to Amsterdam, the Netherlands; and launched a Stakeholder Council to advise the Board on strategic issues, as well as a Technical Advisory Committee to provide high-level technical advice (GRI, 2020b). According to Brown, de Jong, and Lessidrenska (2009), although the GRI was envisioned to create an inclusive, multi-stakeholder approach to dialogue on sustainability reporting, it had limited success in accomplishing this. To "avoid the perception that GRI was a regulatory programme," no government agency was included (Brown, de Jong, & Lessidrenska, 2009, p. 191). Moreover, "participation of organized labour and NGOs has declined" since the initial years, and the GRI governance bodies have become dominated by representatives from large firms, banks, accountancies, and think tanks (Brown, de Jong, & Levy, 2009, p. 573).[3]

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[3] The GRI publicly discloses its governance structure and membership.

Today, the GRI describes itself as an independent organization, with a network structure, dedicated primarily to the establishment of "sustainability reporting standards" (GRI, 2019a). The GRI derives its funding from a variety of sources. In 2018, the GRI reported income of over 9m Euros (GRI, 2019b) from project grants from governments and foundations, corporate sponsorship of projects and events, provision of learning and other services, as well as support from a large international community of members of the GRI Community and Stakeholder Council members (GRI, 2020a). In 2015, the GRI further formalized its organizational structure "to meet the requirements expected of a public standard-setter" by creating a Global Sustainability Standards Board and, thus, separating its standard-setting activities from other organizational activities (GRI, 2020a).[4]

Since 2000, the GRI has published several iterations of the framework, including the G3 in 2006, G3.1 in 2011, G4 2013, and, most recently, the GRI Standards in 2016. Each version of the framework outlines principles for defining reporting quality, general disclosures which are applicable to all reporting entities (such as company name), and disclosure requirements which cover specific topics in the economic, environmental, and social categories (such as emissions and human rights).[5] Each firm is expected to determine its disclosure content based on its own evaluation of topic materiality while considering stakeholder inclusiveness, sustainability context, and completeness. Firms self-declare their compliance with the GRI and are not subject

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[4] Under this structure, members of the GRI's standards-setting governance bodies are selected by an Independent Appointments Committee. Current members include a Deloitte partner, a director of a media company Hallvarsson & Halvarsson, an associate director at S&P Global Rankings, a chairman of an Indian charitable trust concerned with corporate governance (Mahendra & Young Knowledge Foundation), and a U.N. official from the International Labour Organization (GRI, 2020c).

[5] The GRI classifies disclosure items as Profile Disclosures, Disclosure on Management Approach, and Indicators. The Profile Disclosures contain the general information about the firm, while the Indicators and Disclosure on Management Approach describe firm performance and strategy in relation to specific topics.

to any mandatory external verification.[6] Indeed, one of the biggest criticisms of the GRI is that it does not require external assurance (e.g., Sarfaty, 2013). Thus, for the purpose of this paper, GRI adoption is a public *claim* of GRI adoption—the use of GRI label on ESG disclosures—which may or may not be substantiated.[7]

The popularity of the standard and the absence of formal enforcement raises the question of whether the GRI is effective—whether firms which claim to adopt the GRI demonstrate stronger ESG disclosure quality and ESG performance—or whether this voluntary standard is a form of greenwashing, whereby firms claim GRI adoption as a public relations exercise regardless of their actual disclosure and operating practices.[8] The GRI, as a voluntary *disclosure* standard, should be considered effective if GRI adoption indicates higher ESG disclosure quality. This would be consistent with signaling theory, which suggests that firms can take actions "to intentionally communicate positive, imperceptible qualities" of the firm in order to distinguish themselves from their competitors (Connelly et al., 2011, p. 45). If firms can use adoption of a voluntary standard to signal their high type (e.g., high ESG disclosure quality), this would mitigate some of the problems caused by information asymmetry (Akerlof, 1970; Spence, 1973). Because the act of disclosure provides information separate from the content of the disclosure (Bhattacharya & Ritter, 1983; Zerbini, 2017), signaling underlies voluntary disclosure theory (Dye, 1985, 2001; Verrecchia, 1983), and, on balance, suggests that, compared to firms with low

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[6] However, over the years, the GRI has launched several optional paid verification services. For example, the GRI Application Level Check (available 2006–2014) confirmed whether the report met the organization's self-declared application level; the GRI Materiality Disclosures Service (launched in 2013) confirms location of most critical disclosures; and the GRI Content Index Service (launched in 2014) confirms the accuracy of the content index (GRI, 2020b).

[7] I assume that it is rare for firms to adopt the GRI yet not disclose the adoption.

[8] The dichotomy between substantive and symbolic organizational structures, processes, and actions is common in the management and accounting literature. For example, see Merkl-Davies and Brennan (2007) for a discussion of informative versus obfuscating voluntary narrative disclosures.

disclosure quality, firms with high disclosure quality have incentives to disclose their adoption of the GRI voluntary standard.[9]

To be effective, a signal must be observable and costly (Connelly et al., 2011; Spence, 1973).[10] GRI adoption is observable because, in their ESG disclosures, firms make claims such as "This report was prepared in accordance with the GRI." To be considered costly, the benefit of false disclosure is lower than its cost, such that there is no false signaling (Kirmani & Rao, 2000).[11] Given that the GRI framework is complex and requires extensive disclosures of corporate social and environmental performance, compliant GRI adoption is likely easier for high-type firms with internal systems and processes in place to gather and report the required information.[12] These high-type firms likely produce higher quality disclosures even without GRI adoption. To give an example of GRI's complexity and high cost, Brown, de Jong, and Levy (2009) reported that the Dutch bank ABN AMRO required efforts of 150 employees and 16 months to prepare their first report. It is important to note that GRI could also *cause*

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[9] Although disclosure quality may appear to be an "observable" attribute, it is a multidimensional construct and many aspects of disclosure quality cannot be observed. For example, Chan et al. (2012) investigate the use of clawbacks in signaling financial integrity, and, by extension, reporting quality. Thus, disclosure quality is, at best, partially observable. Moreover, differences in user sophistication mean that not all users may be able to properly evaluate disclosure quality and its reliability and credibility. Research in financial accounting demonstrates that even observable attributes of disclosure, such as readability and sentiment, have unintended consequences on users' judgments (e.g., Tan et al., 2014). Thus, if GRI adoption can signal high disclosure quality, it could, at a minimum, improve naive users' judgments and decisions.

[10] To be effective (credible), a signal must also be confirmed ex-post (e.g., Morris, 1987). If a signal cannot be confirmed then its effectiveness cannot be evaluated. In many contexts the confirmation process is fairly well defined: for example, the quality of a product can be determined after purchase, the skill level of a person after hiring, and the quality of management forecasts after the issuance of financial statements. However, it is more difficult to ascertain the quality of a signal in relation to ESG disclosure and ESG performance because these are not readily verifiable by the user. Indeed, currently, the best verification of ESG disclosure quality and performance might come from third-party information intermediaries (the rating agencies) because they collect and synthesize data from diverse sources.

[11] This is often discussed as a negative association between the cost of GRI adoption and disclosure quality (i.e., it must be easier for high types to adopt the GRI). Although Bhattacharya and Ritter (1983) find that, in a model where signaling of private information conveys useful information to a competing firm, the cost is not required to be negatively related to private information to result in a partial disclosure equilibrium.

[12] Signals which require upfront costs regardless of the truthfulness of the claim (such as advertising expense) are referred to as "dissipative" (Zerbini, 2017) or "default-independent" (Kirmani & Rao, 2000), and are contrasted with signals which only incur a cost if the claim is not true (such as warranty).

improvements in disclosure quality.[13] Thus, firms with low disclosure quality (i.e., low types) could choose to implement the necessary reporting systems and processes which would allow them to comply with GRI framework requirements. However, these improvements are likely to be very costly compared to the improvements necessary for a high-type firm; otherwise, all firms would comply with the GRI and reap the benefits of higher quality disclosures.

Similarly, GRI adoption could cause improvements in ESG *performance*. Implementing the internal systems and processes necessary to monitor and disclose on corporate social and environmental performance is likely to cause the firm to better manage these aspects of corporate activity, leading to stronger ESG performance. This would be consistent with the doctrine of transparency (the governance role of disclosure), which states that disclosure, under certain circumstances, incentivizes desirable behaviours in the *preparers*, thus, leading to changes in organizational performance (Fung et al., 2007; Leuz & Wysocki, 2016; Qian & Schaltegger, 2017).[14] Research shows that at least some firms experienced substantive changes in their operations as a result of working to comply with the GRI (e.g., Vigneau et al., 2015); as an example, Brown, de Jong, and Levy (2009) cited a Nike employee: "The report created massive change in the company." However, in parallel with the above arguments regarding disclosure, to be a costly signal of performance, implementation of GRI adoption should be easier for some firms than others. The high-type firms are likely to have the necessary systems and processes in place to produce higher quality ESG disclosures and to better manage their ESG performance regardless of GRI adoption. Thus, it is likely to be cheaper for high types to make the necessary improvements to comply with the requirements of the voluntary standard compared to low types.

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[13] Connelly et al. (2011) refer to these signals as "activating" because they can activate the quality in the signaler, as opposed to "pointing" signals which only indicate the characteristic.
[14] The impact of disclosure, as a regulatory tool, on preparers is distinct from its impact on users, which is strongly debated (see, for example, Etzioni, 2010).

Otherwise, all firms would comply with the GRI and reap the benefits of stronger ESG performance. Determining whether GRI adoption signals stronger ESG performance is a secondary approach to evaluating whether this voluntary disclosure standard is effective (although, unlike signaling of disclosure quality, signaling of performance is not a necessary condition for evaluating the efficacy of a *disclosure* standard).[15,16]

In contrast, the GRI, as a voluntary disclosure standard, should be considered ineffective if GRI adoption does not indicate higher ESG disclosure quality and, to a lesser degree, performance. In other words, a voluntary disclosure standard is ineffective if low-type firms claim to adopt it symbolically (non-compliantly), without improving the internal systems and processes necessary to monitor and disclose their social and environmental performance. In this case, one possible outcome is that there is no observable difference in GRI adoption between high and low types. This would be consistent with a pooling equilibrium, indicating that firms claim to adopt the standard regardless of their actual disclosure and operating practices such that GRI adoption, on average, is not associated with disclosure quality and performance. This outcome is the flip side of the differentiating equilibrium predicted by signaling theory where high types use the signal to distinguish themselves from low types.

A second possible outcome is that low types disproportionately adopt the GRI. This would be consistent with legitimacy theory. Legitimacy theory suggests that, when under threat, firms can adopt voluntary standards symbolically, as opposed to substantively, to improve their public image (e.g., Suchman, 1995). Michelon et al. (2015, p. 63) argued that "in a symbolic use

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[15] It is not necessary that firms use GRI adoption as an active, or intentional signal of ESG performance and disclosure (Lys et al., 2015).

[16] As Spence (1973) demonstrated, an action, such as an individual pursuing higher education, can have both a signaling and a "causal" effect (also see footnote 13) because education both improves one's ability *and* is likely to be pursued by an individual with higher initial ability. In this paper I test the signaling effectiveness of the GRI and not its causal impact. Testing the causal effect requires a setting with an exogenous shock to ensure that the effect is not driven by any endogenous firm characteristics.

of CSR-reporting practices, disclosure would translate in the diffusion of a great volume of 'empty' sentences or replicate boiler-plate information." Thus, according to this view, the GRI standard might be used by firms to obfuscate their real performance and to project an image of the firm as responsible (i.e., to greenwash). Existing research provides evidence that weak performers, which are likely under greater threat, indeed engage in symbolic legitimating action using disclosure tactics (e.g., Cho and Patten, 2007; Cho, Freedman, et al., 2012; Cho, Michelon, et al., 2012; alouthgh see Guthrie & Parker, 1989, for a rebuttal). Given that GRI adoption is self-declared and does not require any external verification (aside from public monitoring), it is possible that firms adopt the GRI symbolically. Thus, if adoption of the GRI standard is used as a public relations tool, then it is likely to be adopted by firms with lower ESG performance and lower ESG disclosure quality (Clarkson et al., 2008; Hummel & Schlick, 2016; Mahoney et al., 2013; Michelon et al., 2015).[17] Either pooling or legitimizing would indicate that the GRI is not an effective voluntary disclosure standard.

Although the GRI has been criticized for being more symbolic than substantive with regard to achieving corporate "sustainability" (e.g., Boiral, 2013; Milne & Gray, 2013), it remains unclear whether GRI adoption effectively signals higher ESG disclosure quality and performance, or whether firms use GRI adoption symbolically to improve their public image. The limited empirical evidence on whether GRI adoption is associated with higher ESG disclosure quality and performance provides mixed results. Michelon et al. (2015) examined the relationship between GRI adoption and environmental and social disclosure quality, and found

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[17] Existing research on legitimacy theory posits a negative relationship between disclosure (specifically, disclosure *quantity*) and performance whereby poor-performing firms use disclosure selectively to obfuscate their performance (e.g., Cho, Freedman, et al., 2012; Clarkson et al., 2008; Hummel & Schlick, 2016; Mahoney et al., 2013; Michelon et al., 2015; Patten, 2019). In contrast, I suggest that firms can use disclosure of GRI adoption as a legitimizing tool to obfuscate both performance and disclosure *quality*.

no difference in quality between firms that adopt the GRI and those that do not.[18] In contrast, Mahoney et al. (2013) examined whether stand-alone CSR reports signal commitment to ESG and provided some evidence that firms that adopt the GRI demonstrate stronger ESG performance than those that do not.[19] Given the competing theoretical predictions and the mixed results in the literature, I state the hypotheses in their null form:

> *H1a: GRI adoption is not associated with ESG disclosure quality.*

> *H1b: GRI adoption is not associated with ESG performance.*

In contrast to the mandatory standards used in financial accounting, which are based on a binary pass–fail approach, the GRI framework includes different levels of standard application. Both G3 and G3.1 had three levels of application (A, B, C), where A represented the "largest number of GRI disclosure items that can be addressed in a report" GRI (2013). The different application levels represent breadth of ESG disclosure rather than quality of ESG performance or disclosure, or compliance with GRI standards. The G4 (2013) standard decreased the number of application levels to two: Core and Comprehensive (GRI, 2015). Similarly, these levels represent breadth of disclosure because reports prepared in accordance with the Core option require the disclosure of at least *one* indicator for each material topic, whereas reports prepared in accordance with the Comprehensive option require the disclosure of *all* indicators for each material topic.[20]

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[18] Michelon et al. (2015) constructed a disclosure quality index that measures quantity and "hardness" of CSR information, and found that this measure is not associated with GRI adoption. However, in their supplementary analysis, the authors found that the degree of specificity of ESG outcome disclosures (e.g., presence of a benchmark) is positively associated with GRI adoption.

[19] Mahoney et al. (2013) used CSR performance scores from the KLD database, and did not control for disclosure quality.

[20] Additional variation in the application of GRI framework arises because some firms follow the standard but do not declare their reports to be "in accordance" with the GRI, and others selectively use certain GRI standards when preparing their ESG reports.

As discussed above, the GRI should be considered effective as a voluntary disclosure standard if GRI adoption indicates higher ESG disclosure quality.[21] A positive association between GRI adoption and disclosure quality would imply that GRI adopters are complying with the standard. Given that more stringent levels of GRI application require more extensive disclosures, if firms comply with the standard, then more stringent GRI application levels should be associated with more transparent disclosures. In other words, firm compliance with the different GRI level requirements should result in a positive association between application levels and ESG disclosure quality.

Moreover, GRI application levels may be used as an indicator of ESG performance. As discussed above, firms that implement the internal systems and processes necessary to monitor and disclose on corporate social and environmental performance are likely to better manage these aspects of corporate activity, leading to stronger ESG performance. Thus, complying with more extensive GRI disclosure requirements is likely to be easier for the stronger performers because of their more comprehensive internal monitoring systems. If GRI application levels are an indicator of firm performance, there should be a positive association between application levels and ESG performance. In their null form, the hypotheses are as follows:

H2a: GRI application levels are not associated with ESG disclosure quality.

H2b: GRI application levels are not associated with ESG performance.

A voluntary disclosure standard would be most informative, as an indicator of disclosure quality, if it indicated disclosure quality directly rather than if it indicated other mechanisms associated with disclosure quality. A number of studies demonstrate that corporate voluntary

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[21] Understanding whether the different levels of GRI application are indicative of underlying differences in ESG disclosure quality and performance is also important because firms publicly disclose their application levels and the different application levels impact users' judgment and decision making processes (e.g., Jin & Leslie, 2003).

financial disclosure practices tend to complement other governance mechanisms, indicating that these disclosure practices may arise as an outcome of, or jointly with, the governance mechanisms employed by the firm (for a review see Beyer et al., 2010). Thus, GRI adoption may be a direct indicator of ESG disclosure quality, or it may indicate the presence of other governance mechanism associated with disclosure quality (see Figure 1).

<Insert Figure 1 about here>

A number of studies demonstrate associations between nonfinancial disclosures and various governance mechanisms. Eccles et al. (2014) showed that firms with high commitment to sustainability are more likely to disclose their nonfinancial data as well as to assign responsibility for sustainability to the board of directors, to create a board-level committee, and to tie executive compensation to environmental and social metrics. Tamimi and Sebastianelli (2017) found that ESG disclosure is associated with larger and more diverse boards, CEO duality, and tying executive compensation to environmental and social metrics. Peters and Romi (2014) reported that ESG disclosures are associated with the presence of an environmental committee and a Chief Sustainability Officer. Existing research also documents growth in ESG disclosure assurance (KPMG, 2017), noting that firms that have a stronger need to enhance their ESG disclosure credibility are more likely to obtain assurance (e.g., Casey & Grenier, 2015; Simnett et al., 2009). Thus, it is possible that firms which adopt the GRI have governance mechanisms in place that lead to high quality disclosure, and that GRI adoption, in and of itself, is not a direct indicator of disclosure quality. Rather, GRI adoption is an indicator of one or more of these governance mechanisms which, in turn, indicate disclosure quality.

However, it is also possible that the GRI provides more than advertisement for disclosures that a firm would produce regardless, given its governance mechanisms. As a

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framework, the GRI provides firms with a thorough guide for ESG disclosure preparation, including specific ESG metrics. For example, the GRI Standard 303 on water lists reporting requirements, recommendations, and guidance for the three topic-specific disclosures: water withdrawal by source, water sources significantly affected by withdrawal of water, and water recycled and reused (GRI Standards, 2016). Thus, it is possible that the GRI framework provides firms with tools for making disclosures that they would not make otherwise. In this case, GRI adoption should indicate ESG disclosure quality directly and independently of other governance mechanisms. Stated in its null form, the third hypothesis is as follows:

H3: GRI adoption is not a direct indicator of ESG disclosure quality.

Chapter 3: Data

3.1. GRI and governance data

I collect firm-level data on ESG disclosure and GRI adoption from the Corporate Register, the GRI's Sustainability Disclosure Database, Bloomberg, and the Thomson Reuters (Datastream) ASSET4 databases. The Corporate Register is a database of nearly 105,000 nonfinancial reports by over 17,500 organizations. This data identifies corporate ESG disclosures and, in the case of GRI reports, their type (i.e., which GRI framework is followed and the level of application). It is my primary source of information on adoption and types of GRI disclosures as it has the most comprehensive coverage. I supplement this data with data from the GRI's Sustainability Disclosure Database, which provides information on corporate sustainability and integrated reports published since 1999. The GRI database also identifies corporate ESG disclosures and the GRI report type where applicable.[22] To help identify ESG disclosures not

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[22] The Corporate Register and the GRI's Sustainability Disclosure Database also indicate whether ESG disclosures refer to several nonfinancial frameworks other than the GRI. I use this data in the supplemental analysis in section 5.

captured by either the GRI's database or the Corporate Register, I use ESG disclosure indicators from the Bloomberg and Thomson Reuters databases.[23]

To collect firm-level data on governance mechanisms, I use indicator variables from the same databases. As noted above, research suggests that ESG disclosure is associated with CEO duality (Tamimi & Sebastianelli, 2017), board size and diversity (Tamimi & Sebastianelli, 2017), assignment of responsibility for sustainability to the board of directors (Eccles et al., 2014), presence of ESG committee (Eccles et al., 2014; Peters & Romi, 2014), presence of a Chief Sustainability Officer (Peters & Romi, 2014), links between ESG and executive compensation (Eccles et al., 2014; Tamimi & Sebastianelli, 2017), and ESG assurance (e.g., Casey & Grenier, 2015; Simnett et al., 2009). In line with this research, I collect data on four variables: presence of a CSR committee (or a committee whose responsibilities include CSR oversight), assignment of CSR responsibility at the board level, links between ESG performance and executive or board compensation, as well as assurance of ESG disclosures. I select these variables because they have a direct (theoretical) relationship with ESG, and because investors seek out information regarding board oversight of sustainability issues and assurance (Ceres, 2018). Definitions of all variables and their sources appear in Appendix A.

3.2. ESG disclosure quality

Generally, studies evaluating disclosure quality of nonfinancial information adopt one of two approaches. Under the first approach, disclosure quality is measured as the amount (or level) of disclosure, and this approach appears more commonly in earlier studies. Specifically, this research measures such disclosure aspects as the number, in absolute or relative terms, of words

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[23] The Thomson Reuters ASSET4 database includes an indicator for whether a company publishes "a separate CSR/H&S/Sustainability report or a section in its annual report on CSR/H&S/Sustainability," and Bloomberg provides an indicator on whether a "company has used the GRI framework for guidance in its public reporting, to varying degrees of compliance."

(e.g., Neu et al., 1998), sentences (e.g., Buhr, 1998), pages (e.g., Patten, 1992), or even the mere existence of CSR reports (e.g., Dhaliwal et al., 2011).

Under the second approach, disclosure quality is measured by evaluating specific content, and this approach appears more commonly in later studies. Specifically, points are typically assigned for "hardness" of specific performance indicators, thus capturing relevance as well as verifiability and objectivity of the information. For example, Al-Tuwaijri, Christensen, and Hughes (2004) focused on disclosures of four environmental topics (the amount of toxic waste, environmental penalties, cleanup responsibility, and the occurrence of reported oil and chemical spills); Brown, Guidry, and Patten (2010) developed a GRI-based index using 24 environmental and 31 social indicators; and Clarkson et al. (2008) developed a GRI-based index of environmental disclosure quality using 95 items.[24] Once the relevant content is identified, points are assigned for disclosure "hardness" with different studies adopting slightly different criteria. For example, a popular method developed by Wiseman (1982) assigned three points for quantitative or monetary disclosures, two for qualitative but specific disclosures, and one for boilerplate disclosures.[25] Similar content-based methods were developed by Ingram and Frazier (1980), Cho, Michelon, Patten, and Roberts (2015), Hummel and Schlick (2016), and Michelon et al. (2015).

To define disclosure quality, I use third-party transparency ratings provided by Bloomberg's ESG Disclosure Scores. Bloomberg ESG disclosure scores are increasingly used in accounting and management literature (e.g., Li et al., 2018; Tamimi & Sebastianelli, 2017) and, I argue below, are in line with the content-based approach used in recent literature. Using third-

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[24] The index developed by Clarkson et al. (2008) was used by Cho, Guidry, Hageman, and Patten (2012), Clarkson et al. (2013), and Plumlee, Brown, Hayes, and Marshall (2015).
[25] This index was used, among others, by Patten (2002), and Cho and Patten (2007).

party ratings has a number of advantages and disadvantages compared to the index-based measures discussed above. Although Bloomberg ESG disclosure scores are a fairly recent measure, they are available for a large sample of firms across industries since 2009, allowing for a larger sample.[26] Also, the score indicates the transparency of corporate public ESG disclosures regardless of their location (e.g., CSR report, annual report, company website), thus providing a more comprehensive measure of ESG disclosure breadth. Finally, research based on third-party ratings can be more easily replicated and extended. The main drawback of using Bloomberg ESG disclosure scores is that the scoring algorithm is proprietary, although this is not unlike other significant data sources that are used in accounting research such as credit ratings.

A Bloomberg ESG disclosure score is company-specific, annual, and ranges from 0.1 to 100, with 100 indicating that a company has disclosed information for every data point collected by Bloomberg, thus a higher score implies greater transparency or breadth of disclosure. To calculate the score, Bloomberg collects data on over 800 ESG metrics, with examples including disclosure of CO_2 scope 1 emissions and percentage of female directors on the board. Each data point is weighted to reflect the relative materiality of the issue to the industry so that companies are only evaluated on industry-relevant metrics. When firms disclose on metrics which are considered material to the industry, they earn more points than when they disclose on metrics which are not material. The points are summed up to provide the final disclosure score. Notably, firms receive points for the *existence* of disclosure and not for their *performance* on the metric. Thus, the score explicitly measures the amount of transparency of ESG disclosures (whether or not a firm reports on the indicator) but not performance (how well a firm does on this indicator) (Eccles et al., 2011). For an example, see Appendix B. Given that the GRI requires disclosures of

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[26] Although it is important to note that Bloomberg has institutional data download limits, making it less research-friendly than most other databases which allow large-sample data downloads.

specific company-material metrics, such as CO_2 scope 1 emissions, compliance with the GRI should be associated with higher Bloomberg ESG disclosure scores. In contrast, if firms adopt the GRI symbolically, without providing rigorous data, then GRI adoption should not be associated with higher Bloomberg scores.

Bloomberg ESG disclosure scores are aligned with both approaches to measuring disclosure quality discussed above (i.e., in terms of disclosure level and content). Bloomberg ESG disclosure scores measure transparency, and since higher transparency requires greater disclosure, the scores are aligned with measures concerned with levels (or amount) of disclosure. Yet, the scores are also aligned with measures concerned with content of disclosure because indicator weights are industry-specific and firms receive higher scores for producing *relevant* content. Both breadth of corporate disclosures and industry-specific weights are key aspects of disclosure quality (e.g., Eccles et al., 2012; Zahller et al., 2015).

3.3. ESG performance

The most commonly used ESG performance measure in the accounting literature is the KLD (Kinder, Lydenberg and Domini) database.[27] Providing annual ESG ratings for a subset of U.S. publicly traded firms between 1991–2016, it was one of the longest continuous ESG measures (MSCI, 2015). Although the methodology changed over the years (Eccles et al., 2019; MCSI, 2015), one of the key attributes of the KLD data was that it provided separate indicators for strengths and weaknesses for variables across seven dimensions (the environment, community, product quality and safety, corporate governance, diversity, employee relations, and human rights). The KLD methodology was phased out by MSCI in 2010, and researchers have turned to alternative data sources.

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[27] Acquired by MSCI in 2010, KLD has become MSCI ESG KLD STATS.

There are currently dozens of measures available which are applicable to different aspects of corporate ESG performance.[28] The ESG ratings most widely used in business research aim to capture the overall ESG performance, yet they do not seem to converge (e.g., Chatterji et al., 2016; Semenova & Hassel, 2015). Berg et al. (2019) decomposed the variance between five popular measures and showed that half of the variation (53%) is attributable to differences in measurements (raters using different indicators to measure the same attribute), and much of the remainder of the variance (44%) is attributable to differences in scope (raters using different attributes to define their rankings). This suggests that different raters capture different aspects of corporate ESG performance, which is not surprising given that there is little agreement on the definition of such underlying concepts as corporate social responsibility or corporate sustainability (e.g., Garriga & Mele, 2004; van Marrewijk, 2003). An alternative approach to using aggregate ratings is using specific performance metrics. This approach has been widely used, for example, in the studies of environmental performance where the U.S. Toxic Release Inventory measures are frequently used (e.g., Clarkson et al., 2008, 2013). A major drawback of this approach is that it relies on a single metric, while ESG is undeniably a multidimensional construct.

To measure corporate ESG performance I use Thomson Reuters (ASSET4) ESG Scores, consistent with recent research in accounting and management (e.g., Cao et al., 2019; Christensen et al., 2018; Lys et al., 2015; Naughton et al., 2019). The ESG Score is "designed to transparently and objectively measure a company's relative ESG performance, commitment and effectiveness" (Thomson Reuters, 2019, p. 6). The score coverage began in 2003 and expanded

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[28] For example, see http://measuresmart.coop/Search.html

over time; for example, the S&P/TSX Composite index was added as of 2009. The score is company-specific, annual, and ranges between 0 and 100.

According to Thomson Reuters (2019) scoring methodology, Thomson Reuters collects data on over 400 ESG metrics which are then reduced to 178 measures selected based on their comparability, data availability, and industry relevance. The measures fall into 10 categories: resource use, emissions, innovation, workforce, human rights, community, product responsibility, management, shareholders, and CSR strategy. Examples of measures in the emissions category include emission targets, biodiversity impact reduction, and NOx and SOx emission reduction. On each measure, a company's performance is assigned a percentile ranking relative to its peers and the measures in each category are averaged across the firm.[29] Then, the averages are ranked across industry peers and each firm is assigned a percentile ranking as its category score. The categories, which are weighted proportionately to the number of measures within each category, roll up into the three ESG pillars which contribute roughly a third to the final ESG score. The data are gathered from a variety of publicly available company-reported sources, such as corporate disclosures and filings. Thus, the ESG score reflects a company's overall performance on metrics in the environmental, social, and corporate governance pillars relative to its peers.[30] For an example, see Appendix B. Given that the GRI requires disclosures of specific company-material metrics, compliance with the GRI should be easier for strong performers who have adequate internal systems and processes in place to gather and report on

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[29] Measures for which there is no company data are excluded from the calculations. One exception is corporate emissions which are estimated by Thomson Reuters when not disclosed.

[30] There is a recent trend in the literature of focusing exclusively on environmental and social aspects of performance while excluding the governance aspect because they are considered to be fundamentally different constructs. However, in this research, I include a combined ESG score to measure performance because my primary construct of interest—adoption of the GRI framework—includes disclosures related to governance (such as the composition of the highest governance body). Thus, because governance is considered relevant for the purposes of ESG disclosure when following the GRI standards, I consider it relevant for the purposes of measuring ESG performance.

the required information, resulting in a positive relationship between GRI adoption and Thomson Reuters ESG scores. In contrast, if firms adopt the GRI symbolically, without providing rigorous data, then GRI adoption should not be associated with higher ESG performance scores.

3.4. Financial data

I collect financial data from Compustat, and stock return data from CRSP and the Canadian Financial Markets Research Centre. Definitions of all variables and their sources appear in Appendix A.

3.5. Sample description

The panel data covers Canadian and U.S. firms in the extractive industry (i.e., oil, gas, metals, and mining) for the 2009–2018 time period (coinciding with available ESG data). The extractive sector has high social and environmental impacts and is subject to strong public pressure and scrutiny. Thus, perhaps not surprisingly, this sector demonstrates high levels of ESG disclosure relative to other industries (KPMG, 2017). Given strong incentives for extractive firms to manage public perceptions, focusing the analysis on this sector provides a strong test of the GRI's efficacy as a costly signal or a legitimating tool (Patten, 1991). If a voluntary standard effectively signals disclosure quality and indicates performance in an industry subject to strong stakeholder pressure, it is likely to be effective in other, less-controversial industries.[31]

The sample is restricted to observations with ESG performance and disclosure quality data. The final panel data sample consists of 1,665 firm-year observations from 269 firms with U.S.-domiciled firms representing 46% of the sample, and with 62% belonging to the oil and gas

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[31] An alternative reasoning is that voluntary standards are effective in an industry subject to strong stakeholder pressure *because* of the scrutiny, and that firms in less scrutinized industries would use voluntary standards symbolically. However, this alternative is less likely if we assume, consistent with stakeholder theory of the firm (Freeman, 1984), that firms are more likely to engage in symbolic action in response to stakeholder pressure and not in the absence of it.

sector. ESG performance scores range from 17 to 93, and ESG disclosure scores range from 5 to 78. In the sample, ESG disclosures are present in 50% of observations (either as stand-alone CSR reports or within annual reports; untabulated); among these, 15% indicate GRI adoption (i.e., preparing their ESG disclosure in accordance with the GRI). Table 1 reports the number of observations by year and the percentage of observations indicating GRI adoption. Interestingly, since 2015, although the number of observations has increased, the percentage of observations indicating GRI adoption has decreased.[32] Figure 2 plots average disclosure and performance scores over the sample period. The performance scores remain flat because Thomson Reuters uses a percentile rank scoring methodology which evaluates a firm's performance in relation to its peers. Thus, by definition, the average performance of the extractive industry is set at roughly 50%. However, the Bloomberg disclosure score averages have increased steadily over time.[33] Table 2 presents descriptive statistics of all variables included in regression analyses.

The firms in the sample (see Table 2), on average, have a slightly positive return on assets of 0.5% and leverage of 24%. The financing variable is positive, indicating that firms tended to raise new financing rather than decrease debt or repurchase shares. The average size value of 8.408 is a natural log of total assets, implying asset values of over $4.4bn. I winsorize all continuous, unbounded (i.e., financial) variables at the first and 99th percentiles. The sample are broadly consistent with those reported by Clarkson et al. (2008), who examined five environmentally sensitive industries, and Lys et al. (2015), who analyzed a broad range of industries, with a couple of exceptions: in these two samples, firms had a more positive return on

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[32] This may be a result of smaller firms being added to the sample, as the GRI tends to be adopted by larger firms (e.g., KPMG, 2017). It is also possible that fewer firms are adopting the latest GRI framework introduced in 2016.
[33] This trend is consistent with evidence of the growing supply of ESG disclosures over time (e.g., KPMG, 2017).

assets of approximately 5%; Lys et al. (2015) also reported a much larger average firm size at over $8bn in total assets.

Notably, compared to the final sample in this study (i.e., firms with ESG performance and disclosure quality data available), firms in the full sample of the Canadian and U.S. extractive sector are, on average, smaller (average total assets of $60m vs. $4.4bn), less profitable (ROA of -0.83 vs. 0.005), more leveraged (47% vs. 24%), with a higher market to book ratio (7.53 vs. 1.23), and much higher capital intensity (2.52 vs. 0.55). This suggests that Thomson Reuters and Bloomberg tend to focus on larger, more established firms in their datasets. This is not surprising given that these firms are likely to have greater disclosures, which are necessary for the third-party intermediaries to conduct their ESG analysis.

The Pearson correlation matrix (Table 3) shows that ESG performance and ESG disclosure quality are highly correlated with each other (at 0.77) and moderately correlated with GRI adoption (at 0.40 and 0.55, respectively). These correlations suggest that ESG performance, ESG disclosure quality, and GRI are fairly interrelated. ESG performance and ESG disclosure measures are also highly correlated with firm size (at 0.59 and 0.55, respectively), and governance scores (at 0.77 and 0.51, respectively), and moderately correlated with the presence of a CSR committee (at 0.47 and 0.42, respectively), ESG links to compensation (at 0.44 and 0.38, respectively), and ESG assurance (at 0.49 and 0.59, respectively). GRI adoption is also moderately correlated with ESG assurance (at 0.43).[34] Lastly, Table 4 shows the frequency distribution of high and low ESG disclosure scores (i.e., those above and below the median)

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[34] To examine whether multicollinearity is a concern, I examine variable inflation factors (VIF) and condition indices for all specifications used in the regression analysis. I find that in several specifications the condition number exceeds 30, suggesting multicollinearity. I also find that orthogonalizing size reduces the condition number to below 30. Thus, in all specifications below, size refers to residuals of size regressed on return on assets, leverage, and market to book value. In all of the resulting specifications, VIFs are within the acceptable range (i.e., < 3), suggesting multicollinearity is no longer a concern.

across GRI adopters and nonadopters. According to Table 4, the majority of GRI adopters (96%) have ESG disclosure scores above the median. Moreover, of the GRI adopters with high disclosure scores, the vast majority (92%) have ESG performance scores above the median, compared to 79% of GRI nonadopters with high disclosure scores, and 17% of firms with low disclosure scores. These observations further suggest that the relationship between GRI, ESG performance, and ESG disclosure quality is strong.

<Insert Tables 1–4 and Figure 2 about here>

Chapter 4: Research design and analysis

In this section, I explain my research design and present my analysis. I begin by examining, in section 4.1, the endogenous nature of the relationships among ESG disclosure quality, ESG performance, and GRI adoption. In section 4.2, I test H1a and H1b by examining whether GRI is an incremental signal of disclosure quality and performance. In section 4.3, I test H2a and H2b by analyzing firm compliance with different GRI application levels. Finally, in section 4.4, I test H3 by examining the relationship between GRI adoption and other governance mechanisms which indicate disclosure quality.

4.1. Endogeneity among ESG performance, ESG disclosure quality, and GRI adoption

Research suggests that a firm's overall strategy may determine such corporate outcomes as ESG disclosure quality, ESG performance, and GRI adoption (Al-Tuwaijri et al., 2004; Ullmann, 1985). As noted by Al-Tuwaijri et al. (2004, p. 448), "in executing the corporation's strategic business plan, management implements policies and initiates decisions that simultaneously affect the firm's environmental performance, environmental disclosure, and economic performance." Similarly, the overall management strategy is likely to influence the firm's actions that impact social and governance performance and disclosure, including the

adoption of voluntary standards; in other words, these corporate attributes are likely to be highly

endogeneity (for a discussion on endogeneity see Glaeser & Guay, 2017).

To examine endogeneity between GRI adoption, ESG disclosure quality, and ESG

performance, I use a system of simultaneous equations, following Al-Tuwaijri et al. (2004),

where I alternatively use ESG disclosure quality and GRI adoption.[35] Thus, I use the first system

of simultaneous equations to test the relationship between ESG performance and ESG disclosure

quality:

$$DQUAL_{i,t} = \beta_0 + \beta_1 PERF_{i,t} + \sum_{\beta=2}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \qquad (1a)$$

$$PERF_{i,t} = \beta_0 + \beta_1 DQUAL_{i,t} + \sum_{\beta=2}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \qquad (1b)$$

And then substitute GRI adoption for disclosure quality in the second system to test the

relationship between ESG performance and GRI adoption, as follows:

$$GRI_{i,t} = \beta_0 + \beta_1 PERF_{i,t} + \sum_{\beta=2}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \qquad (2a)$$

$$PERF_{i,t} = \beta_0 + \beta_1 GRI_{i,t} + \sum_{\beta=2}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \qquad (2b)$$

For firm i in period t, *PERF* is a measure of ESG performance based on the Thomson Reuters

ESG score, *DQUAL* is a measure of ESG disclosure quality based on the Bloomberg disclosure

score, and *GRI* is a binary indicator which equals 1 if an observation indicates GRI adoption at

any application level.[36] Following the current literature, I control for variables shown to affect

ESG performance (Lys et al., 2015; Naughton et al., 2019) and voluntary corporate disclosure

(Clarkson et al., 2008). Thus, control variables for ESG disclosure include financing, market-to-

book value, stock market volatility, return on assets, leverage, firm size, newness of assets,

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[35] An ideal test would be based on a system of equations that includes all three endogenous variables in a three-stage least squares regression. However, given the challenge of identifying appropriate instrumental variables for GRI adoption and a moderate correlation between ESG disclosure quality and GRI adoption (0.55), I begin by substituting GRI adoption for ESG disclosure quality.

[36] This includes reports which claim to meet the requirements, and thus does not include reports which use the GRI standards selectively or as guidance as these do not meet the requirements under the GRI.

capital intensity, and media sentiment; and control variables for ESG performance include return

on assets, cash holdings, cashflow from operations, leverage, market-to-book value, firm size,

and corporate governance, as well as R&D, advertising, and litigation spending.[37] All variables

are defined in Appendix A.

If ESG disclosure quality, performance, and GRI adoption are indeed jointly determined,

then the coefficient on β_1 should be significantly positive in all four equations. Tables 5 and 6

present results for the first and second systems of equations, respectively, based on two-stage

least squares (2SLS) regression, with standard errors of the coefficients clustered at the firm

level and with year-fixed effects to control for trends in ESG disclosure and performance over

time. Consistent with the notion that ESG disclosure and performance are jointly determined, the

results indicate a statistically significant positive association between ESG performance and ESG

disclosure quality, and vice versa. In Table 5, column [1], ESG disclosure quality is the

dependent variable and the coefficient on ESG performance is 0.445, with a *t*-statistic of 8.24; in

column [2], ESG performance is the dependent variable and the coefficient on ESG disclosure

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[37] The instrumental variables (i.e., excluded instruments) for the *DQUAL* variable are financing, volatility, asset newness, capital intensity, and controversy score; the instrumental variables for *PERF* are cash, cash from operations, R&D, advertising and litigation expenses, and governance score. The remainder of the control variables are common to both equations: return on assets, leverage, market-to-book, and size, where size is orthogonalized with respect to return on assets, leverage, and market to book value (see footnote 34). To determine the validity of using 2SLS (see e.g., Harford et al., 2014), I examined the suitability of the instruments in the ESG disclosure quality (1a) and performance (1b and 2b) equations. The results of these analyses are as follows. First, I checked *F*-tests of excluded instruments from first stage regression to examine whether instruments are weak in explaining the endogenous variable (i.e., weak identification). The results indicate that instruments are strong in the case of the *PERF* variable, and relatively weak in the case of the *DQUAL* and *GRI* variables. Given that instruments for the *DQUAL* and *GRI* variables are not sufficiently strong, I checked weak-instrument robust inference. The results reject the null hypothesis that the coefficient on the endogenous regressor is equal to zero. Second, the results of tests for whether the instruments are relevant to, or correlated with, the endogenous regressors indicate that the instruments are correlated with the endogenous regressors in all three equations (i.e., no underidentification). Third, the results from a Sargan-Hansen test indicates that the instrumental variables are valid, or uncorrelated with the error term, in all three equations (i.e., no overidentification). Finally, an endogeneity test checks whether ESG disclosure quality, ESG performance, and GRI adoption are exogenous. The results of this test confirm that these variables are indeed endogenous, and that it is appropriate to use 2SLS rather than ordinary least squares.

quality is 1.196, with a *t*-statistic of 7.10.[38] Similarly, the results indicate a significant positive association between ESG performance and GRI adoption, and vice versa. In Table 6, column [1], GRI adoption is the dependent variable and the coefficient on ESG performance is 0.007, with a *t*-statistic of 4.82; in column [2], ESG performance is the dependent variable and the coefficient on GRI adoption is 58.80, with a *t*-statistic of 3.96.

<Insert Tables 5 and 6 about here>

The coefficients on other independent variables regressed on ESG disclosure are fairly consistent with previous research. Consistent with Clarkson et al. (2008), coefficients on size and asset newness are significant, indicating that bigger firms and firms with older assets are more likely to have higher disclosure scores. In contrast to results reported by Clarkson et al. (2008), leverage, while also significant, has the opposite sign, indicating that more leveraged firms are less likely to have high ESG disclosure scores; also, return on assets is significant, while capital intensity is not. When substituting GRI for disclosure quality as the dependent variable, the GRI indicator is affected by leverage (negative sign) and volatility (positive sign).

The coefficients on other independent variables regressed on ESG performance indicate that higher ESG performance scores are predicted by lower cashflow from operations and higher governance scores.[39] When substituting GRI for disclosure quality, ESG performance continues

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[38] These results are consistent with previous research. Al-Tuwaijri et al. (2004) used a system of equations to examine the relationships among economic performance, environmental performance, and environmental disclosure. The authors found that the level of environmental disclosure is positively related to environmental performance, and that the level of environmental performance is positively related to the level of *historical* environmental disclosure. My results indicate that these relationships generalize to ESG performance and disclosure, and that ESG performance is positively associated with the *current* level of ESG disclosure.

[39] Note that these coefficients are not directly comparable with Lys et al. (2015) due to the different specifications. Most importantly, Lys et al. (2015) used a CSR measure that excludes the corporate governance component, and did not include a measure for ESG disclosure when predicting ESG performance. In untabulated results, I find that the coefficients are more in line with Lys et al. (2015) when the ESG disclosure score is removed from the regression. Specifically, consistent with Lys et al. (2015), return on assets, size, market-to-book, R&D expense, and the corporate governance score become highly significant. In contrast to Lys et al. (2015), the coefficient is not significant on cashflow from operations, but is significant on cash.

to be positively affected by corporate governance; it is also predicted by firm size and R&D expense.

Overall, these results highlight the endogenous nature of ESG disclosure quality, performance, and GRI adoption. ESG performance and ESG disclosure quality are strongly associated with each other, indicating that strong performers also tend to have high disclosure quality (and vice versa). Similarly, ESG performance and GRI adoption are strongly associated with each other, indicating that strong performers also tend to be GRI adopters (and vice versa). The positive relationship between ESG performance and GRI adoption provides preliminary evidence that GRI might signal ESG performance. However, it is also possible that GRI adoption is simply an indicator of high disclosure quality, and that GRI adoption is not associated with performance after controlling for the effects of disclosure quality. In the next section I investigate the link between GRI and disclosure quality, and the signaling efficacy of the GRI while controlling for endogeneity between ESG disclosure quality and performance.

4.2. Signaling value of GRI adoption

While the results in the last section demonstrate a link between GRI adoption and ESG performance, I begin this section by examining the link between GRI adoption and ESG disclosure quality. Specifically, I begin by looking at the frequency distribution of high and low ESG disclosure scores (i.e., those above and below the median) across GRI adopters and nonadopters. According to Table 4, 96% of GRI adopters have ESG disclosure scores above the median.[40] Indeed, only seven observations with GRI adoption fall into the bottom two quintiles of ESG disclosure scores (untabulated). Table 7 shows average ESG disclosure scores broken down into four categories: high-disclosure-quality GRI adopters ("high adopters"), high-

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[40] GRI adoption is significantly associated with high disclosure quality X^2 (3, $n = 1,665$) = 931.88, $p < 0.001$.

disclosure-quality GRI nonadopters ("high nonadopters"), low-disclosure-quality GRI

nonadopters ("low nonadopters"), and low-disclosure-quality GRI adopters ("low adopters").[41]

According to Table 7, high adopters have higher disclosure quality scores than high nonadopters

(M = 48 vs. 36), and both groups have much higher disclosure scores than low nonadopters (M =

15); I graphically illustrate this result in Figure 3. Overall, these results provide evidence that

GRI adoption is strongly related to ESG disclosure quality, and that it is uncommon for GRI

adopters to provide low-quality disclosures.

<center><Insert Table 7 and Figure 3 about here></center>

The above findings on GRI adoption, disclosure quality, and performance suggest that

they are highly interrelated. Indeed, results in Tables 4 and 7 provide further evidence that firms

which claim GRI adoption tend to demonstrate both higher ESG disclosure quality *and*

performance scores. According to Table 7, high adopters have higher ESG performance scores

than high nonadopters (M = 68 vs. 61), and both groups have much higher scores than low

nonadopters (M = 39). Moreover, according to Table 4, of the high adopters, 92% have ESG

performance scores above the median, compared to 79% of high nonadopters and 17% of low

nonadopters. These results are consistent with the above findings that GRI adoption, ESG

disclosure quality, and performance are likely endogenously determined by the overall corporate

strategy, and provide further support to the hypothesis that GRI adoption is a credible signal of

ESG disclosure quality and performance.

Table 7 summarizes several factors that may help explain the relationship between GRI

adoption and disclosure quality.[42] According to Table 7, compared to low nonadopters, high

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[41] I do not comment on low adopters because, according to Table 4, this category contains only ten observations.
[42] The untabulated results describing these same factors in relation to GRI adoption based on high and low
performance scores (i.e., those above and below the median) are almost identical.

adopters and nonadopters tend to be much larger firms, with an average size difference of over $6bn. High adopters also tend to have more cash (as a portion of total assets), compared to nonadopters. Several governance measures indicate that high adopters have stronger internal mechanisms: they have the highest governance score, as well as the highest percentage of observations with ESG committees, ESG-linked compensation, and assurance. High adopters and high nonadopters also have worse controversy scores indicating that they may be subject to stronger external pressure compared to firms with low disclosure quality. Overall, these results indicate that high adopters tend to be larger firms, with spare cash, and with strong internal governance mechanisms. The evidence that GRI adoption is related to both, strong internal governance mechanisms and worse controversy scores, further indicates that the more successful firms in this industry are under greater public pressure and scrutiny.

Although the above analysis demonstrates that GRI adoption is associated with disclosure quality and performance, I now investigate whether GRI adoption has an *incremental* signaling ability after controlling for effects of other factors which we know to impact ESG disclosure quality and performance. To determine whether GRI adoption is associated with disclosure quality incrementally to performance, and vice versa (i.e., whether GRI adoption is associated with ESG performance incrementally to disclosure quality), I add GRI adoption to the system of equations as follows:

$$DQUAL_{i,t} = \beta_0 + \beta_1 PERF + \beta_2 GRI_{i,t} + \sum_{\beta=3}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \tag{3a}$$

$$PERF_{i,t} = \beta_0 + \beta_1 DQUAL + \beta_2 GRI_{i,t} + \sum_{\beta=3}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \tag{3b}$$

All variables are defined above and remain unchanged. If GRI adoption has signaling ability incremental to disclosure quality and performance, then coefficients on GRI adoption (β_2) should be positive and significant. Table 8 presents results of a 2SLS regression, with standard

errors of the coefficients clustered at the firm level and with year-fixed effects. The results for Eq. (3a) indicate that, after controlling for performance, GRI adoption is positively and significantly associated with disclosure quality. In column [1], disclosure quality is the dependent variable and the coefficient on GRI adoption is 14.81, with a *t*-statistic of 9.66. This result provides further evidence of a strong relationship between GRI adoption and disclosure quality, and indicates that GRI signals disclosure quality even after controlling for the level of ESG performance. Together, results in this section demonstrate a strong relationship between GRI adoption and disclosure quality, thus rejecting H1a that there is no association between these two variables.

<Insert Table 8 about here>

Results for Eq. (3b) on the relationship between GRI adoption and ESG performance are less consistent: after controlling for disclosure quality level, GRI adoption is *negatively* and significantly associated with performance. In other words, for a given level of disclosure quality, GRI adoption is associated with lower ESG performance scores. In column [2], performance is the dependent variable and the coefficient on GRI adoption is -14.52, with a *t*-statistic of -3.37. To investigate this result further, I split the sample along GRI adoption and examine the effect of ESG disclosure quality on ESG performance for GRI adopters and nonadopters separately (Eq. (1b)). The results are presented in Table 9 and indicate that, for a subsample of GRI adopters, there is no association between ESG disclosure quality and performance. In column [1], the coefficient on disclosure quality is 0.220, with a *t*-statistic of 0.50. In contrast, there is a positive association between ESG disclosure quality and performance for the subsample of nonadopters. In column [2], the coefficient on disclosure quality is 1.253, with *t*-statistic of 6.28. This result suggests that the positive association between GRI adoption and ESG performance observed in

Table 6 is driven by the association between GRI adoption and disclosure quality. To the extent that GRI adoption is positively associated with disclosure quality, it is also positively associated with performance. However, the variation in the *GRI* variable which cannot be explained by disclosure quality is negatively associated with performance. In other words, the findings indicate that, in general, GRI adoption is positively associated with ESG performance (as discussed above, also see Tables 4, 6, and 7), yet it is negatively associated with ESG performance incrementally to disclosure quality, thus rejecting H1b that GRI is not associated with ESG performance.

<Insert Table 9 about here>

The overall findings on the GRI–disclosure quality link are strong and consistent with signaling theory: adoption of the GRI is a signal of ESG disclosure quality, even after controlling for ESG performance. However, because most firms that adopt the GRI demonstrate both high disclosure quality and performance, it is difficult to untangle the relationship between GRI and performance. There is a strong association between GRI adoption and ESG performance when not controlling for disclosure quality. Yet, this relationship is indirect and driven by the GRI–disclosure quality link. These results complement the findings by Mahoney et al. (2013) and suggest that the positive relationship between GRI adoption and ESG performance is driven mainly by disclosure quality. These results contrast the findings by Michelon et al. (2015), suggesting that the lack of an observed association between GRI adoption and disclosure quality may be sensitive to measures of disclosure quality and endogeneity.

The results also indicate that the variation in the *GRI* variable which is unexplained by disclosure quality is negatively associated with performance. This result is curious and warrants a more thorough investigation in the future. It is possible that this result is driven by weak ESG

performers using GRI adoption as a legitimating strategy. However, this seems unlikely given that only a handful of weak performers claim GRI adoption (see Table 4). Given that GRI adoption is predominantly claimed by firms with above-average disclosure and performance scores, perhaps GRI adoption helps distinguish ESG "leaders" and "followers", with leaders demonstrating top performance *without* adopting the GRI. The evidence in the data for this explanation is mixed. On one hand, high adopters demonstrate higher average performance scores than high nonadopters, suggesting that GRI adopters tend to have stronger performance than other firms with high disclosure quality. On the other hand, in each of the top two deciles of performance scores the majority of observations (54% and 60%, respectively) do not claim GRI adoption (untabulated), suggesting that most strong performers do not adopt the GRI. Thus, while GRI is associated with ESG performance, this relationship is more nuanced than it first appears.

4.3. Compliance with GRI standards

Given that more stringent levels of GRI application require more extensive disclosures, if firms comply with the standard, then more stringent GRI application levels should be associated with more transparent disclosures. Moreover, complying with more extensive GRI disclosure requirements is likely to be easier for the stronger performers because of their more comprehensive internal monitoring systems. In this section, I examine whether firms comply with GRI application level requirements as indicated by the relationships between GRI application levels and disclosure and performance scores. Specifically, I add a *GRI_high_low* indicator variable to the simultaneous system of equations as follows:

$$DQUAL_{i,t} = \beta_0 + \beta_1 PERF_{i,t} + \beta_2 GRI\_high\_low_{i,t} + \sum_{\beta=3}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \quad (4a)$$

$$PERF_{i,t} = \beta_0 + \beta_1 DQUAL_{i,t} + \beta_2 GRI\_high\_low_{i,t} + \sum_{\beta=3}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \quad (4b)$$

For firm *i* in year *t*, the *GRI_high_low* dummy variable is defined in three different ways:

1. *GRI_high_low* equals 1 if an observation indicates the highest level of the GRI application (i.e., levels A and Comprehensive), and 0 if an observation does not indicate GRI adoption.

2. *GRI_high_low* equals 1 if an observation indicates any other level of the GRI application (i.e., levels B, C, and Core), and 0 if an observation does not indicate GRI adoption.

3. *GRI_high_low* equals 1 if an observation indicates the highest level of the GRI application (i.e., level A, Comprehensive), and 0 if an observation indicates any other level of the GRI application (i.e., levels B, C, and Core).

If firms comply with the different application level requirements, then the coefficient on GRI_high_low should be positive and significant in Eq. (4a) under all three definitions. If different application levels are associated with stronger ESG performance, then the coefficient on GRI_high_low should be positive and significant in Eq. (4b) under all three definitions. All other variables are defined above and remain unchanged.

Table 10 presents results based on 2SLS regression, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. The coefficient on *GRI_high_low* is positive and significant in columns [1a] to [3a], where ESG disclosure quality is the dependent variable. In column [1a], which compares the highest level of GRI adoption to non-adoption, the coefficient on the *GRI_high_low* is 17.24, with a *t*-statistic of 13.32; in column [2a], which compares all other levels of GRI adoption to non-adoption, the coefficient on *GRI_high_low* is 9.205, with a *t*-statistic of 11.43; and in column [3a], which compares the highest level of GRI adoption to all other levels of GRI adoption, the coefficient on

GRI_high_low is 5.367, with a *t*-statistic of 3.61. Thus, when controlling for ESG performance, firms that adopt the GRI at any application level other than high, demonstrate significantly higher ESG disclosure quality scores than non-adopters, but significantly lower scores than firms that adopt the GRI at a high level. In other words, firms that adopt the GRI at more stringent levels comply with more extensive disclosure requirements and produce more transparent disclosures, even after controlling for ESG performance. These results provide evidence to reject the null hypothesis H2a that there is no association between GRI application levels and ESG disclosure quality. Given that GRI adoption is voluntary and that adherence to the GRI is not subject to any mandatory enforcement mechanisms, this result is noteworthy. Not only do firms that claim GRI adoption provide more transparent disclosures, but these firms, on average, comply with the different application level requirements and provide more transparent disclosures as requirements increase.

<Insert Table 10 about here>

Now turning to ESG performance as the dependent variable, the coefficients on *GRI_high_low* are not significant under either specification in columns [1b] to [3b]. This result indicates that, after controlling for ESG disclosure quality, GRI application level is not associated with ESG performance. This lack of association between the two variables is not surprising given the findings presented in section 4.2 that the relationship between GRI adoption and ESG performance is driven by the GRI–disclosure quality link. However, according to the doctrine of transparency (the governance role of disclosure), it is *disclosure* that incentivizes desirable behaviours in the preparers, leading to changes in organizational performance (e.g., Fung et al., 2007). Thus, I examine whether GRI levels are associated with ESG performance

through their impact on ESG disclosure.[43] The untabulated results indicate that, compared to GRI non-adoption, GRI adoption at the highest level is positively and significantly associated with performance (the coefficient on *GRI_high_low* (definition 1) is 29.14, with a *t*-statistic of 11.68, $p<0.05$). This result suggests that only the greatest difference in disclosure quality is associated with stronger performance scores. Overall, these results provide limited evidence to reject the null H2b, that there is no association between GRI application levels and ESG performance. However, the analysis of the GRI levels provides further insight into the GRI–performance link. It suggests that the positive association between GRI adoption and ESG performance is driven by the firms with the highest GRI adoption level, further extending findings by Mahoney et al. (2013) on the positive relationship between GRI adoption and ESG performance.

4.4. The relationship between GRI and governance mechanisms

While the findings above provide strong evidence of a positive association between GRI adoption and disclosure quality, it is unclear whether GRI is a direct indicator of disclosure quality or an indirect indicator—perhaps GRI is an indicator of governance mechanisms which are known to impact disclosure quality. Thus, in this section, I examine whether GRI adoption is an indicator of disclosure quality or an indicator of governance mechanisms which impact disclosure quality. I begin by examining which governance mechanisms are associated with disclosure quality and GRI adoption:

$$DQUAL_{i,t} = \beta_0 + \beta_1 PERF + \beta_2 COMM + \beta_3 RESPONSIBILITY_{i,t} + \beta_4 COMP_{i,t} +$$

$$\beta_5 ASSUR + \sum_{\beta=6}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \tag{5a}$$

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[43] Specifically, I examine the following equation using a 2SLS regression, with standard errors of the coefficients clustered at the firm level and with year-fixed effects: $PERF_{i,t} = \beta_0 + \beta_1 GRI\_high\_low_{i,t} + \sum_{\beta=2}^{n} Control\ variables_{i,t} + \varepsilon_{i,t}$

$$GRI_{i,t} = \beta_0 + \beta_1 PERF + \beta_2 COMM + \beta_3 RESPONSIBILITY_{i,t} + \beta_4 COMP_{i,t} + \beta_5 ASSUR +$$

$$\sum_{\beta=6}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \qquad (5b)$$

For firm *i* in year *t, COMM* is a dummy variable that equals 1 if the company has a committee

with ESG-related responsibilities, and 0 otherwise; *RESPONSIBILITY* is a dummy variable that

equals 1 if the company assigns responsibility for CSR at the board level, and 0 otherwise;

COMP is a dummy variable that equals 1 if executive or board compensation is tied to ESG, and

0 otherwise; and *ASSUR* is a dummy variable that equals 1 if there is any type of assurance

related to ESG disclosure, and 0 otherwise.[44] All other variables are defined above and remain

unchanged.

If firms that disclose their ESG performance are more likely to have an ESG committee,

assign CSR responsibility at the board level, tie executive or board compensation to ESG

performance, or provide assurance on their ESG disclosures, then the coefficients on

$\beta_2, \beta_3, \beta_4,$ and β_5 in Eq. (5a) should be positive and significant. Likewise, if GRI adoption is

strongly affected by these governance mechanisms, then the coefficients on $\beta_2, \beta_3, \beta_4,$ and β_5 in

Eq. (5b) should also be positive and significant. Table 11 presents results for Eqs. (5a) and (5b)

based on 2SLS regression, with standard errors of the coefficients clustered at the firm level and

with year-fixed effects. The results indicate that only the presence of an ESG committee and

assurance are positively and significantly associated with ESG disclosure quality and GRI

adoption. In column [1], disclosure quality is the dependent variable and the coefficient on ESG

committee is 4.576, with a *t*-statistic of 4.97, while the coefficient on assurance is 13.50, with a *t*-

statistic of 6.76; in column [2], GRI is the dependent variable and the coefficient on ESG

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[44] The assurance variable captures any type of assurance: for example, either in relation to compliance with the framework or quality of the content; either in relation to the comprehensive report, or a specific subject matter area.

committee is 0.082, with a *t*-statistic of 3.79, while the coefficient on assurance is 0.361, with a *t*-statistic of 4.93. The coefficients on assignment of CSR responsibility and ESG links to compensation are not significant. This result indicates that GRI adoption (and disclosure quality) is related to only two of the four governance mechanisms examined: the presence of an ESG committee and assurance on ESG disclosure.[45]

<Insert Table 11 about here>

I also examine whether the presence of an ESG committee and assurance are associated with ESG performance.[46] Untabulated results indicate that, after controlling for disclosure quality and GRI adoption, presence of an ESG committee is not associated with performance, indicating that such committees appear to be more concerned with disclosure rather than performance.[47] However, assurance is negatively associated with ESG performance, when controlling for GRI adoption and disclosure quality (the coefficient on assurance variable is -8.26, with a *t*-statistic of -1.96, p=0.051), perhaps providing further support to the finding in the literature that assurance is likely to be adopted by firms with a stronger need to enhance their disclosure credibility (e.g., Casey & Grenier, 2015; Simnett et al., 2009). Overall, these results suggest that different governance practices are associated with disclosure as opposed to performance outcomes.

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[45] In contrast, Michelon et al. (2015) report no association between disclosure quality and assurance.

[46] Specifically, I examine the following equation using a 2SLS regression, with standard errors of the coefficients clustered at the firm level and with year-fixed effects: $PERF_{i,t} = \beta_0 + \beta_1 DQUAL_{i,t} + \beta_2 GRI_{i,t} + \beta_3 COMM_{i,t} + \beta_4 ASSUR_{i,t} + \sum_{\beta=5}^{n} Control\ variables_{i,t} + \varepsilon_{i,t}$

[47] Moreover, different types of committees may be associated with disclosure quality and performance. Eccles et al. (2014) reported a positive association between the presence of a board-level ESG committee and ESG performance; in contrast, this sample captures presence of an ESG committee at any level of the organization.

Having identified the relevant governance mechanisms, I examine whether GRI adoption

indicates disclosure quality directly or whether it indicates the presence of an ESG committee or

assurance, using the following specification:

$$DQUAL_{i,t} = \beta_0 + \beta_1 PERF_{i,t} + \beta_2 GRI_{i,t} + \beta_3 COMM_{i,t} + \beta_4 ASSUR + \beta_5 GRI_{i,t} \text{ x } COMM_{i,t} +$$

$$\beta_6 GRI_{i,t} \text{ x } ASSUR_{i,t} + \sum_{\beta=7}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \hspace{2cm} (6)$$

If GRI adoption has an effect on disclosure quality that is incremental to that of the presence of

an ESG committee and assurance, then the coefficient on GRI adoption should be positive and

significant. I also include the interaction terms in order to determine whether there is an

interactive effect between GRI adoption and the presence of an ESG committee, as well as

between GRI adoption and assurance. If the effect of GRI adoption on disclosure quality is

enhanced by the presence of an ESG committee or assurance, then the coefficient on the

interaction terms should be significantly positive. Alternatively, if GRI adoption and the

presence of an ESG committee and assurance are independent mechanisms that indicate ESG

disclosure quality, then the coefficient on the interaction term should be insignificant. All

variables are defined above and remain unchanged.

Table 12 presents results for Eq. (6) based on 2SLS regression, with standard errors of

the coefficients clustered at the firm level and with year-fixed effects. The results indicate that

GRI adoption, the presence of an ESG committee, and assurance are all positively and

significantly associated with disclosure quality. The coefficient on GRI adoption is 16.28, with a

t-statistic of 3.12; the coefficient on the presence of an ESG committee is 3.606 with a *t*-statistic

of 4.12; and the coefficient on assurance is 9.615 with a *t*-statistic of 6.37. This result indicates

that GRI adoption, the presence of an ESG committee, and assurance are direct, incremental

indicators of disclosure quality. Moreover, the coefficients on the two interaction variables are

not significant, indicating that GRI adoption, the presence of an ESG committee, and assurance are distinct, independent indicators of disclosure quality. The incremental effect of GRI adoption on disclosure quality provides the necessary evidence to reject the null hypothesis H3 that GRI adoption is not a direct indicator of disclosure quality. Overall, these findings provide further evidence that, consistent with signaling theory, GRI adoption is a direct indicator (and a costly signal) of disclosure quality.

<center><Insert Table 12 about here></center>

Chapter 5: Extending analysis to other frameworks

This section provides preliminary evidence on whether the findings regarding GRI adoption can be generalized to other nonfinancial disclosure frameworks. The findings on GRI adoption indicate that firms comply with the requirements of the GRI framework by providing more transparent disclosures; moreover, through its effect on disclosure quality, GRI adoption is associated with stronger ESG performance. While GRI is the most prevalent framework, several other initiatives have been growing in popularity. Among these are Integrated Reporting by the International Integrated Reporting Council, U.N. Global Compact (UNGC), and U.N. Sustainable Development Goals (SDGs).

I obtain data regarding claimed adoption of these frameworks from the Corporate Register and the GRI's Sustainability Disclosure Database (see footnote 22). According to Table 2, only a handful of firms in the sample claim adoption of UNGC, Integrated Reporting, or U.N. SDGs (n = 84, 9, and 52, respectively). To examine whether claimed adoption of these frameworks is associated with ESG disclosure quality and performance, I use the following system of equations:

$$DQUAL_{i,t} = \beta_0 + \beta_1 PERF + \beta_2 GRI_{i,t} + \beta_3 UNGC_{i,t} + \beta_4 INTEGRATED_{i,t} + \beta_5 SDG_{i,t} +$$

$$\sum_{\beta=6}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \qquad (7a)$$

$$PERF_{i,t} = \beta_0 + \beta_1 DQUAL + \beta_2 GRI_{i,t} + \beta_3 UNGC_{i,t} + \beta_4 INTEGRATED_{i,t} + \beta_5 SDG_{i,t} +$$

$$\sum_{\beta=6}^{n} Control\ variables_{i,t} + \varepsilon_{i,t} \qquad (7b)$$

For firm i in year t, *UNGC* is a dummy variable that equals 1 if an observation indicates UNGC

adoption, and 0 otherwise; *INTEGRATED* is a dummy variable that equals 1 if an observation

indicates Integrated Reporting adoption, and 0 otherwise; *SDG* is a dummy variable that equals 1

if an observation indicates U.N. SDGs adoption, and 0 otherwise. All other variables are defined

above and remain unchanged.

If any of these frameworks have a positive impact on ESG disclosure quality or

performance (after controlling for the effects of other frameworks as well as the effects of

performance and disclosure quality) then their respective coefficients should be positive and

significant. Table 13 presents results for Eqs. (7a) and (7b) based on 2SLS regression, with

standard errors of the coefficients clustered at the firm level and with year-fixed effects. Results

indicate that the effects of UNGC adoption mirror those of GRI adoption: UNGC adoption is

positively and significantly associated with ESG disclosure quality (after controlling for

performance) and negatively and significantly associated with ESG performance (after

controlling for disclosure quality). In column [1], disclosure quality is the dependent variable and

the coefficient on UNGC adoption is 7.061, with a *t*-statistic of 3.25; in column [2], performance

is the dependent variable and the coefficient on UNGC adoption is -8.324, with a *t*-statistic of -

2.45. Thus, consistent with signaling theory, both GRI and UNGC adoption signal ESG

disclosure quality incrementally to performance. Yet, both of these frameworks are negatively

associated with performance when controlling for disclosure quality, raising questions about the drivers and outcomes of these frameworks beyond disclosure.

<Insert Table 13 about here>

The coefficients on other frameworks are not significant. The lack of an association between Integrated Reporting adoption and disclosure quality and performance is not surprising given the small number of observations. The coefficients on U.N. SDGs adoption are also not significant, raising questions about result generalizability, and suggesting that voluntary ESG frameworks cannot be assumed to be effective indicators of disclosure quality or performance. Perhaps voluntary frameworks are not unlike their mandatory counterparts: just as the effectiveness of a mandatory standard is largely determined by its implementation (e.g., Leuz & Wysocki, 2016), that is likely the case for a voluntary standard as well.

The different results for GRI and UNGC adoption compared to U.N. SDGs adoption also hint at differences between "principles-based" and "rules-based" standards (e.g., Jamal & Tan, 2010). Of the tested frameworks, GRI and UNGC are more specific in their requirements. As discussed above, for each material topic, the GRI requires firms to report on specific metrics. UNGC, while less granular than the GRI, is based on ten principles related to human rights and labour, environment, and corruption; each principle, in turn, outlines tangible company initiatives that would put the company in line with that principle. In contrast, guidance from the U.N. SDGs framework is more general, principles-based. It is possible that adoption of voluntary rules-based standards leads firms to comply with specific reporting requirements and provide more transparent disclosures. In contrast, adoption of voluntary principles-based standards could be more amendable to symbolic action, resulting in a pooling equilibrium.

Chapter 6: Conclusion

In this study, I examine the effectiveness of voluntary disclosure standards within the context of corporate nonfinancial (specifically, ESG) disclosures. Although ESG disclosures are becoming increasingly important (e.g., Eccles et al., 2011), this corporate practice remains largely unregulated (e.g., Huang & Watson, 2015). In the absence of mandatory reporting requirements, a number of voluntary standards have emerged to help guide companies through the process of preparing their ESG disclosures. Among these, the GRI has become the most prevalent (e.g., KPMG, 2017). Yet, notably, corporate claims of GRI adoption are not subject to any mandatory enforcement or verification, providing a valuable setting for the study of voluntary standard efficacy.

As a voluntary disclosure standard, the GRI should be considered effective primarily if it is associated with higher ESG disclosure quality. The GRI provides firms with a detailed framework for reporting on their ESG performance, and compliance with the GRI should result in more transparent (i.e., higher quality) disclosures. A secondary approach to evaluating whether a voluntary disclosure standard is effective, is if it indicates stronger ESG performance. The doctrine of transparency (or the governance role of disclosure) suggests that disclosure may incentivize desirable behaviours in the preparers and, thus, improve performance (e.g., Fung et al., 2007). This positive association between GRI adoption and disclosure quality and performance would be consistent with signaling theory, indicating that high-type firms are using GRI adoption as a costly signal of their superior disclosure quality and performance (Connelly et al., 2011; Spence, 1973). As an alternative hypothesis, a negative association between GRI adoption and disclosure quality and performance would be consistent with legitimacy theory, indicating that low-type firms are adopting GRI symbolically to improve their public image

(Clarkson et al., 2008; Mahoney et al., 2013; Michelon et al., 2015; Patten, 1991). This outcome is possible because claims of GRI adoption are not subject to any mandatory enforcement mechanisms and, thus, can be made regardless of the firm's actual disclosure and operating practices.

The findings on the GRI–disclosure quality link are strong and consistent with signaling theory. The results indicate that adoption of the GRI voluntary standard—the use of GRI label on ESG disclosures—signals ESG disclosure quality (even after controlling for ESG performance). Moreover, firms that adopt the GRI appear to comply with framework requirements, even in the absence of mandatory verification, because more stringent GRI application levels are associated with more transparent ESG disclosures. Lastly, the results indicate that two governance mechanisms (the presence of an ESG committee and ESG assurance) are positively associated with GRI adoption, yet all three mechanisms (GRI adoption, the presence of an ESG committee, and ESG assurance) are incremental and independent indicators of disclosure quality. Thus, users can rely on the GRI label as a direct indicator of more transparent disclosures.

However, the findings on the GRI–performance link are less clear. Because most firms that adopt the GRI demonstrate both high disclosure quality and strong performance, it is difficult to untangle the relationship between GRI and performance. There is a strong association between GRI adoption and ESG performance when not controlling for disclosure quality. Yet, this relationship appears to be driven by the highest GRI application level adopters; and the relationship is also indirect, driven by the GRI–disclosure quality link. Moreover, when controlling for disclosure quality, GRI adoption is negatively associated with performance. While this result is inconsistent with signaling theory, it also seems inconsistent with legitimacy theory because, according to the data, GRI adoption is predominantly claimed by firms with

above-average disclosure and performance scores. Thus, the relationship between GRI adoption and performance is one area for future research.

Another area for future research is examining whether the findings generalize to other voluntary ESG disclosure frameworks. In additional analysis, I provide preliminary evidence that these findings do not hold for the U.N. Sustainable Development Goals framework. However, the pattern of results observed with GRI adoption does hold for U.N. Global Compact (UNGC) adoption. Notably, consistent with signaling theory, UNGC adoption is positively associated with disclosure quality, even after controlling for performance.

Overall then, the findings of this study suggest that, as a voluntary disclosure standard, GRI is effective: firms that claim GRI adoption produce more transparent ESG disclosures as intended by the standard. Thus, in a competitive standard-setting environment which can be observed in the realm of nonfinancial disclosure, the most widely adopted voluntary standard is a credible signal of higher disclosure quality. Moreover, given that GRI adoption is not subject to any mandatory enforcement, the findings suggest that social norms and informal sanctions can help drive corporate disclosure (e.g., Sunder, 2010).

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Appendix A

Variable	Measure	Source
Panel A: ESG variables		
DQUAL	ESG disclosure quality is ESG Disclosure Score.	Bloomberg
PERF	ESG performance is Thomson Reuters ESG Score.	ASSET4
GRI	Indicator of GRI adoption.	GRI Database, CorporateRegister.com
GOVNCESCORE	Corporate Governance score.	ASSET4
CONTROVSCORE	ESG Controversies Scores as a measure of media sentiment.	ASSET4
COMM	ESG committee indicates whether there is a committee for which at least one of the committee's responsibilities explicitly includes oversights of CSR/sustainability activities.	ASSET4, Bloomberg
RESPONSIBILITY	ESG responsibility indicates whether there is a director on the board with responsibility for CSR/sustainability.	Bloomberg
COMP	ESG compensation indicates whether board or executive compensation is linked to ESG goals.	ASSET4, Bloomberg
ASSUR	ESG disclosure assurance of any type.	CorporateRegister.com ASSET4
UNGC	Indicator of U.N. Global Compact adoption.	GRI Database, CorporateRegister.com
INTEGRATED	Indicator of Integrated Framework adoption.	GRI Database, CorporateRegister.com
SDG	Indicator of U.N. Sustainable Development Goals adoption.	GRI Database, CorporateRegister.com
Panel B: Financial variables		
ROA	Income before extraordinary items divided by total assets measured at the beginning of fiscal year.	Compustat
LEV	Leverage is sum of long-term debt and debt in current liabilities divided by total assets measured at the end of fiscal year.	Compustat
MTB	Market-to-book is sum of market value of equity, long-term debt, debt in current liabilities, liquidation value of preferred stock, deferred taxes and investment credit divided by total assets measured at the end of fiscal year.	Compustat

SIZE	Natural logarithm of total assets, measured at the end of fiscal year.	Compustat
FIN	Financing for the fiscal year is the sale of common stock and preferred shares minus the purchase of common stock and preferred shares, plus long-term debt issuance minus the long-term debt reduction. The amount is scaled by the size of total assets at the beginning of the fiscal year.	Compustat
CASH	Cash scaled by total assets measured at the end of fiscal year.	Compustat
CFO	Cash flow from operations divided by total assets measured at the end of fiscal year.	Compustat
VOLAT	Volatility is a standard deviation of market adjusted monthly stock return during the fiscal year. Market adjusted monthly stock return for Canadian firms not available through CRSP is calculated by subtracting the CFMRC Value Weighted Index from monthly return.	CRSP, Canadian Financial Markets Research Centre (CFMRC)
ADVERTISING	Advertising expense scaled by net sales for the fiscal year.	Compustat
R&D	Research and development expense scaled by net sales for the fiscal year.	Compustat
LITIGATION	Litigation expense scaled by net sales for the fiscal year.	ASSET4
ASSETNEW	Asset newness is a ratio of net properties, plant and equipment divided by the gross properties, plant and equipment at the end of fiscal year.	Compustat
CAPINTENSITY	Capital intensity is a ratio of capital spending divided by total sales revenues at the end of fiscal year.	Compustat

Bloomberg ESG Disclosure Score

For 2018, the score for Abraxas Petroleum was 17.4, compared to Hess Corporation's score of 69.7. These differences in scores indicate that Bloomberg was able to obtain data on a greater number of metrics for Hess compared to Abraxas. Indeed, a quick search through Abraxas' website and 2018 annual report shows paucity of ESG information. Examples of metrics considered material for an oil and gas firm in each of the categories, as per the screenshot below, include:

- Environmental: GHG/revenue, GHG/MBOE, carbon reserves;
- Social: women employees in management ratio, proportion of women employees, employee turnover;
- Governance: proportion of independent directors, average director age, and proportion of director meeting attendance.

Abraxas and Hess receive an equal number of points for each of the metric *disclosed*. As the metrics are industry weighted, firms receive a larger number of points for each material metric compared to nonmaterial one. The points are added up to result in a final ESG disclosure score. Thus, Hess's higher score implies that it disclosed data on a greater number of industry-material metrics compared to Abraxas.

Source: https://www.bloomberg.com/impact/products/esg-data/
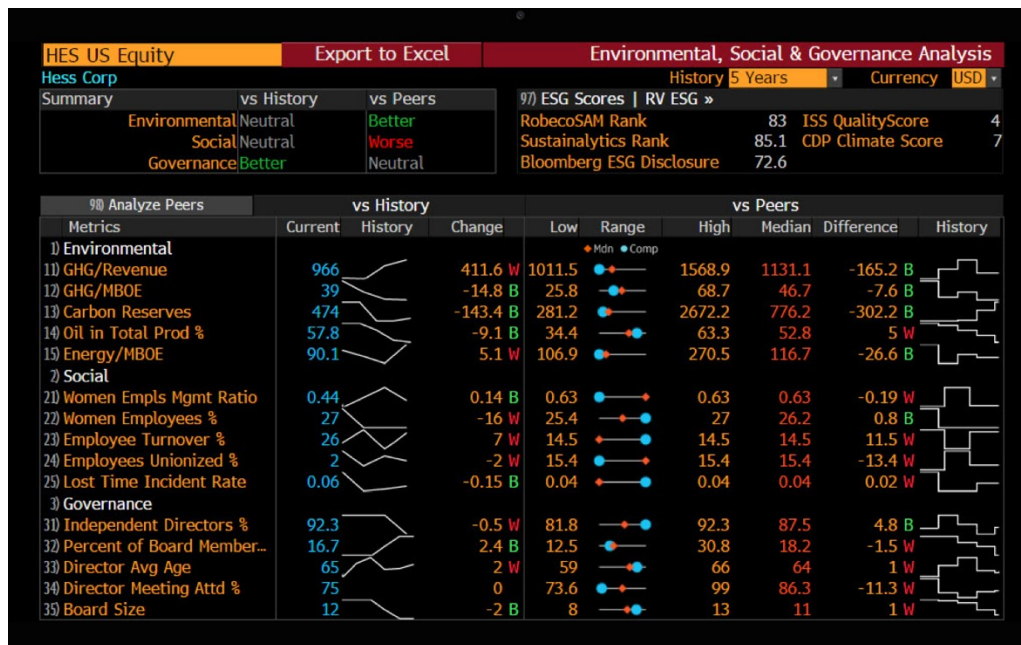
Thomson Reuters (ASSET4) ESG Scores

For 2018, the score for Abraxas Petroleum was 39.29, compared to Hess Corporation's score of 73.8. These differences in scores indicate that Abraxas' ESG performance measures are generally ranked below its peers, while Hess' ESG performance measures are generally ranked above its peers.

For each industry-relevant measure, Abraxas and Hess are assigned a percentile ranking relative to their peers. Measures for which there is no company data are excluded from the calculation, with an exception of corporate emissions which are estimated by Thomson Reuters. These measures are averaged across each category and then assigned a percentile ranking for the category. The final ESG score is a weighted-average of percentile rankings in each of the ten categories, as follows:

Category	Weights	Pillar
Resource use	11%	Environmental
Emissions	12%	
Innovation	11%	
Workforce	16%	Social
Human rights	4.5%	
Community	8%	
Product responsibility	7%	
Management	19%	Governance
Shareholders	7%	
CSR Strategy	4.5%	
Total	100%	ESG score

Figure 1: GRI adoption as a direct versus indirect indicator

This figure presents a schematic representation of two possible relationships between GRI and disclosure quality. Panel A depicts a direct relationship where GRI adoption is a direct indicator of disclosure quality. Panel B depicts an indirect relationship where GRI adoption is an indicator of governance mechanisms which, in turn, indicate disclosure quality. Thus, in Panel B, GRI adoption is an indirect indicator of disclosure quality.

Panel A: Direct relationship
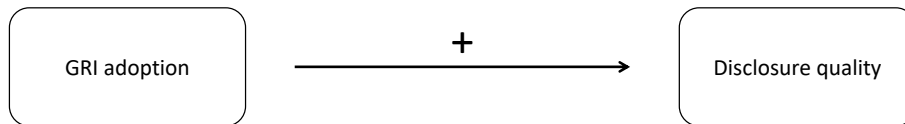
Panel B: Indirect relationship
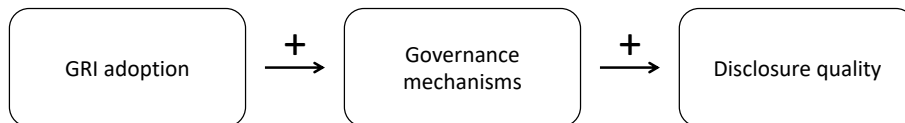
Figure 2: Average ESG disclosure quality and performance scores

This figure presents average ESG disclosure quality and performance scores over the sample period. All variables are defined in Appendix A. The performance scores remain flat because Thomson Reuters uses a percentile rank scoring methodology which evaluates a firm's performance in relation to its peers. Thus, by definition, the average performance of the extractive industry is set at roughly 50%. However, Bloomberg disclosure score averages have increased steadily over time. This trend is consistent with evidence of the growing supply of ESG disclosures (e.g., KPMG, 2017).
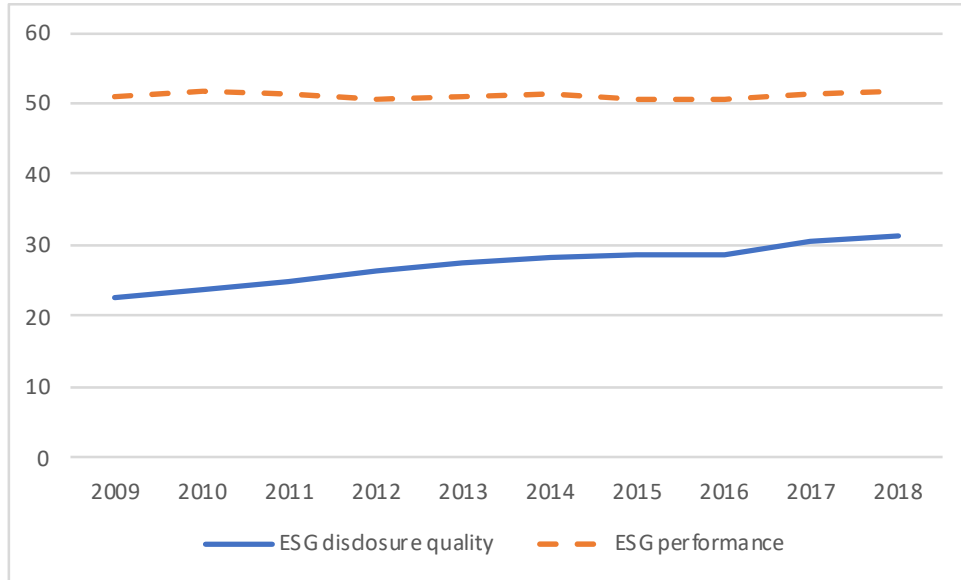
Figure 3: ESG disclosure quality and GRI adoption

This figure presents average low and high disclosure scores (i.e., those below and above the median) for GRI adopters and nonadopters. All variables are defined in Appendix A. The results indicate that high disclosure quality is significantly higher than low disclosure quality, and, more importantly, that average high disclosure quality is higher for adopters compared to nonadopters.
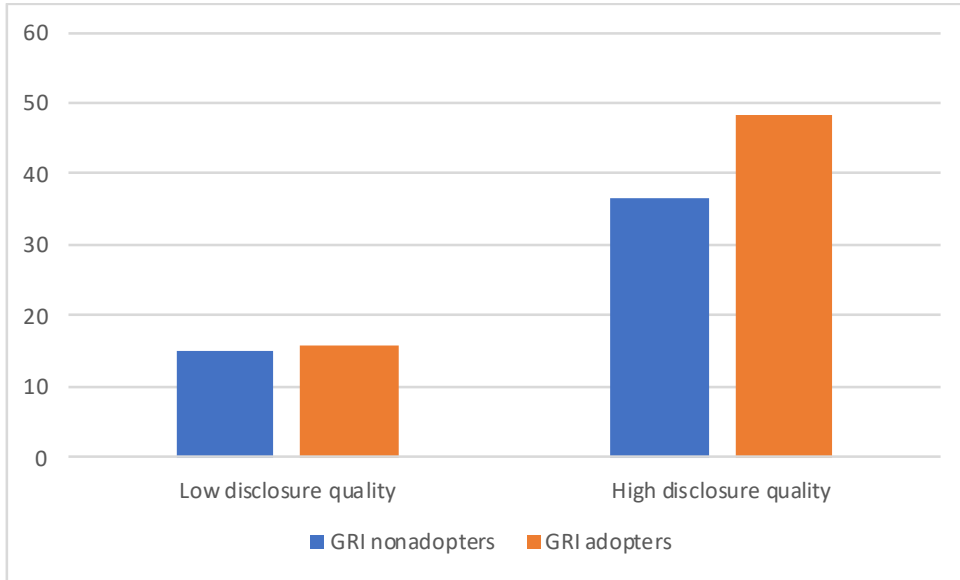
Table 1: Sample composition

This table presents the composition of the sample, broken down by the number of observations per year and the percentage of observations indicating GRI adoption. All variables are defined in Appendix A. Over the sample period, the percentage of observations indicating GRI adoption has decreased while the number of observations has increased. This may be a result of smaller firms being added to the sample, as the GRI tends to be adopted by larger firms (e.g., KPMG, 2017). The data for 2018 is likely incomplete.

Year	Number of observations	Percentage of observations with GRI adoption
2009	133	20%
2010	146	18%
2011	147	20%
2012	153	14%
2013	157	17%
2014	164	14%
2015	184	13%
2016	202	15%
2017	208	17%
2018	171	9%
Total	1665	

Table 2: Descriptive statistics

This table presents descriptive statistics of the variables used in regression analyses. Panel A (B) presents firm-level ESG (financial) variables. All variables are defined in Appendix A. ESG disclosure scores range from 5 to 78, and ESG performance scores range from 17 to 93. GRI adoption is indicated in 15.5% of observations. On average, these firms have a slightly positive return on assets and leverage of 24%. The financing variable is positive, indicating that firms tended to raise new financing rather than decrease debt or repurchase shares. The average size value of 8.41 is a natural log of total assets, implying asset values of over $4.4bn.

	(1) N	(2) Mean	(3) Sd	(4) Min	(5) Max
Panel A: ESG variables					
DQUAL	1,665	27.52	15.29	5.394	78.01
PERF	1,665	51.08	17.02	17.19	93.34
GRI	1,665	0.155	0.362	0	1
GOVNCESCORE	1,665	56.50	22.36	6.260	98.77
CONTROVSCORE	1,665	48.99	21.06	0.230	70.73
COMM	1,665	0.694	0.461	0	1
RESPONSIBILITY	1,665	0.0108	0.103	0	1
COMP	1,665	0.717	0.451	0	1
ASSUR	1,665	0.133	0.339	0	1
UNGC	1,665	0.0505	0.219	0	1
Integrated	1,665	0.00541	0.0733	0	1
SDGs	1,665	0.0318	0.176	0	1
Panel B: Financial variables					
ROA	1,665	0.00532	0.108	-0.414	0.287
LEV	1,665	0.249	0.177	0	0.925
MTB	1,665	1.232	0.668	0.342	4.123
SIZE	1,665	8.408	1.489	5.332	12.36
FIN	1,665	0.0593	0.138	-0.155	0.756
CASH	1,665	0.0741	0.0865	0	0.412
CFO	1,665	0.0999	0.0661	-0.0671	0.295
VOLAT	1,665	0.115	0.0624	0.0305	0.372
ADVERTISING	1,665	1.75e-05	0.000123	0	0.000992
R&D	1,665	0.000391	0.00152	0	0.00940
LITIGATION	1,665	311.3	2,024	0	17,304
ASSETNEW	1,665	0.641	0.190	0.130	0.972
CAPINTENSITY	1,665	0.555	0.674	0.0113	4.206

Table 3: Pearson correlation matrix

This table presents the Pearson correlation matrix. All variables are defined in Appendix A. ***, **, and * indicate p<0.01, p<0.05, p<0.1, respectively. The correlation between ESG performance and ESG disclosure quality is high at 0.77, and correlations between GRI adoption, and ESG performance and ESG disclosure quality are 0.40 and 0.55, respectively. ESG performance is highly correlated with firm size and governance score (at 0.59 and 0.77, respectively); and ESG disclosure quality is also correlated with firm size, governance score, and assurance (at 0.55, 0.51, and 0.59, respectively).

	PERF	DQUAL	GRI	ROA	LEV	MTB	SIZE	CASH	CFO	FIN	VOLAT	R&D	ADVERTISING	LITIGATION	ASSETNEW	CAPINTENSITY	GOVNCESCORE	CONTROVSCORE	COMM	RESPONSIBILITY	COMP
PERF	1.00																				
DQUAL	0.77***	1.00																			
GRI	0.40***	0.55***	1.00																		
ROA	0.07**	0.06**	0.03	1.00																	
LEV	-0.06**	-0.07**	-0.12***	-0.26***	1.00																
MTB	-0.15***	-0.15***	-0.03	0.22***	0.00	1.00															
SIZE	0.59***	0.55***	0.15***	0.15***	0.18***	-0.15***	1.00														
CASH	-0.02	-0.04	0.10***	0.08**	-0.25***	0.19***	-0.30***	1.00													
CFO	-0.05	0.03	-0.01	0.36***	-0.07**	0.33***	-0.01	0.03	1.00												
FIN	-0.23***	-0.22***	-0.09***	-0.02	0.11***	0.21***	-0.13***	0.09***	-0.12***	1.00											
VOLAT	-0.15***	-0.15***	0.03	-0.34***	0.13***	-0.14***	-0.40***	0.20***	-0.16***	0.02	1.00										
R&D	0.09***	0.07**	-0.04	0.02	-0.07**	-0.07**	0.08***	-0.00	-0.13***	-0.05*	-0.07**	1.00									

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
ADVERTISING	0.02	-0.02	-0.05*	0.02	-0.00	-0.05	0.00	-0.01	-0.01	-0.07**	-0.04	0.16***	1.00									
LITIGATION	-0.01	-0.03	-0.02	-0.05*	0.06*	0.01	0.03	-0.05	-0.01	0.01	0.02	-0.04	-0.00	1.00								
ASSETNEW	-0.14***	-0.16***	-0.01	0.21***	-0.19***	0.08**	0.01	-0.02	-0.21***	0.24***	-0.10***	-0.07**	-0.07**	-0.01	1.00							
CAPINTENSITY	-0.31***	-0.22***	-0.12***	-0.16***	0.09***	0.13***	-0.12***	-0.08**	-0.09***	0.46***	0.05*	-0.14***	-0.08***	-0.00	0.20***	1.00						
GOVNCESCORE	0.77***	0.51***	0.25***	0.02	-0.02	-0.12***	0.38***	-0.04	-0.05	-0.16***	-0.09***	-0.01	-0.00	-0.04	-0.10***	-0.19***	1.00					
CONTROVSCORE	-0.35***	-0.31***	-0.12***	-0.04	-0.04	0.08**	-0.44***	0.03	0.07**	0.12***	0.12***	-0.07**	-0.06**	-0.09***	0.06*	0.13***	-0.15***	1.00				
COMM	0.47***	0.42***	0.27***	-0.02	-0.17***	-0.18***	0.23***	0.08***	-0.15***	-0.13***	-0.00	-0.07**	-0.09***	-0.00	0.04	-0.21***	0.38***	-0.20***	1.00			
RESPONSIBILITY	0.02	-0.02	0.07**	0.06*	-0.07**	0.02	-0.02	0.08**	0.02	0.01	0.01	0.01	-0.01	0.03	0.06*	-0.02	0.02	-0.03	0.07**	1.00		
COMP	0.44***	0.38***	0.17***	0.01	-0.05*	-0.18***	0.28***	0.04	-0.02	-0.15***	-0.04	0.03	0.01	-0.01	-0.08**	-0.19***	0.37***	-0.16***	0.26***	0.01	1.00	
ASSUR	0.49***	0.59***	0.43***	0.09***	-0.10***	-0.08**	0.34***	0.01	0.04	-0.12***	-0.10***	0.10***	0.02	-0.02	-0.09***	-0.15***	0.27***	-0.21***	0.23***	0.01	0.21***	

n=1665

Table 4: GRI adoption, disclosure quality, and performance frequency

This table presents frequency distribution for low and high disclosure quality and performance scores (i.e., below and above the median) for GRI nonadopters and adopters. All variables are defined in Appendix A. The results indicate that 96% of GRI adopters have disclosure quality scores above the median, and of these observations, 92% also have above-median performance scores. In contrast, the proportion of above-median performance scores for nonadopters with high and low disclosure quality is 79% and 17%, respectively.

	GRI nonadopters	GRI adopters	Total
Low DQUAL	825	10	835
Low PERF	687	5	692
High PERF	138	5	143
High DQUAL	582	248	830
Low PERF	120	21	141
High PERF	462	227	689
Total	1407	258	1665

Table 5: The relationship between ESG disclosure quality and performance

This table presents results from a 2SLS estimation of the simultaneous equation system, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. Consistent with the notion that ESG disclosure and performance are jointly determined, the results indicate a statistically significant positive association between ESG performance and ESG disclosure quality, and vice versa. The dependent variables are ESG disclosure quality (Column 1) and ESG performance (Column 2). All variables are defined in Appendix A. Robust standard errors in parentheses. ***, **, and * indicate $p<0.01$, $p<0.05$, $p<0.1$, respectively, using two-tailed tests.

Dependent Variable:	[1] DQUAL	Dependent Variable:	[2] PERF
PERF	0.445***	DQUAL	1.196***
	(0.05)		(0.17)
ROA	9.948***	ROA	-0.438
	(2.99)		(4.09)
LEV	-6.316***	LEV	4.853*
	(2.10)		(2.49)
MTB	-0.219	MTB	0.020
	(0.66)		(0.88)
SIZE	3.087***	SIZE	-1.603
	(0.63)		(0.98)
FIN	-1.458	CASH	-0.100
	(2.00)		(5.35)
VOLAT	11.079	CFO	-19.098***
	(6.90)		(6.50)
ASSETNEW	-6.415**	R&D	330.195
	(2.60)		(265.16)
CAPINTENSITY	0.085	ADVERTISING	7,857.425*
	(0.56)		(4,098.51)
CONTROVSCORE	-0.022	LITIGATION	0.000
	(0.02)		(0.00)
		GOVNCESCORE	0.213***
			(0.04)
Observations	1,665	Observations	1,665
Year FE	Yes	Year FE	Yes

Table 6: The relationship between GRI adoption and ESG performance

This table presents results from a 2SLS estimation of the simultaneous equation system, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. The results indicate a statistically significant positive association between ESG performance and GRI adoption, and vice versa. The dependent variables are GRI adoption (Column 1) and ESG performance (Column 2). All variables are defined in Appendix A. Robust standard errors in parentheses. ***, **, and * indicate $p<0.01$, $p<0.05$, $p<0.1$, respectively, using two-tailed tests.

Dependent Variable:	[1] GRI	Dependent Variable:	[2] PERF
PERF	0.007***	GRI	58.800***
	(0.00)		(14.84)
ROA	0.014	ROA	6.844
	(0.10)		(5.66)
LEV	-0.200**	LEV	9.402*
	(0.08)		(4.81)
MTB	0.011	MTB	-1.112
	(0.02)		(1.07)
SIZE	-0.001	SIZE	2.760***
	(0.02)		(0.87)
FIN	-0.009	CASH	-9.243
	(0.07)		(10.70)
VOLAT	0.619***	CFO	1.479
	(0.24)		(9.07)
ASSETNEW	0.037	R&D	1,277.117**
	(0.07)		(571.49)
CAPINTENSITY	-0.010	ADVERTISING	9,138.287*
	(0.02)		(5,187.83)
CONTROVSCORE	-0.000	LITIGATION	0.000
	(0.00)		(0.00)
		GOVNCESCORE	0.276***
			(0.06)
Observations	1,665	Observations	1,665
Year FE	Yes	Year FE	Yes

Table 7: On the relationship between GRI adoption and disclosure quality

This table summarizes data on several factors which may affect the relationship between GRI adoption and disclosure quality broken down into: high disclosure quality GRI adopters ("high adopters"), high disclosure quality GRI nonadopters ("high nonadopters"), low disclosure quality GRI nonadopters ("low nonadopters"), and low disclosure quality GRI adopters ("low adopters"). All variables are defined in Appendix A. The results indicate that 1) high adopters have higher disclosure quality and performance scores than high nonadopters; 2) high adopters and nonadopters are much larger firms compared to low nonadopters; 3) high adopters have stronger internal mechanisms than firms in other groups; and, 4) high adopters and nonadopters have lower controversy scores.

	High adopters	High nonadopters	Low nonadopters	Low adopters
n	248	582	825	10
Average DQUAL	48.39	36.50	15.05	15.66
Average PERF	67.90	60.90	39.13	49.00
Average SIZE	9.01	9.17	7.71	6.86
Average CASH	0.09	0.06	0.07	0.14
Average GOVNCESCORE	70.39	65.10	46.35	49.54
Proportion with COMM	99%	82%	52%	90%
Proportion with COMP	91%	87%	55%	70%
Proportion with RESPONSIBILITY	2%	0%	1%	20%
Proportion with ASSUR	49%	16%	1%	0%
Average CONTROVSCORE	42.52	43.17	54.96	55.47

Table 8: The incremental effect of GRI adoption

This table presents results from a 2SLS estimation of the simultaneous equation system, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. The results indicate that GRI adoption is positively and significantly associated with disclosure quality after controlling for performance. However, it is negatively and significantly associated with performance after controlling for disclosure quality. The dependent variables are ESG disclosure quality (Column 1) and ESG performance (Column 2). All other variables are defined in Appendix A. Robust standard errors in parentheses. ***, **, and * indicate $p<0.01$, $p<0.05$, $p<0.1$, respectively, using two-tailed tests.

Dependent Variable:	[1] DQUAL	Dependent Variable:	[2] PERF
PERF	0.337***	DQUAL	1.312***
	(0.05)		(0.22)
GRI	14.817***	GRI	-14.518***
	(1.53)		(4.31)
ROA	9.753***	ROA	-0.967
	(2.37)		(4.01)
LEV	-3.355*	LEV	3.008
	(1.74)		(2.34)
MTB	-0.381	MTB	-0.167
	(0.52)		(0.88)
SIZE	3.104***	SIZE	-1.742
	(0.48)		(1.14)
FIN	-1.319	CASH	5.428
	(1.65)		(5.06)
VOLAT	1.951	CFO	-20.924***
	(5.24)		(6.86)
ASSETNEW	-6.975***	R&D	142.701
	(2.19)		(283.21)
CAPINTENSITY	0.228	ADVERTISING	6,686.824
	(0.45)		(4,100.42)
CONTROVSCORE	-0.018	LITIGATION	0.000
	(0.01)		(0.00)
		GOVNCESCORE	0.235***
			(0.04)
Observations	1,665	Observations	1,665
Year FE	Yes	Year FE	Yes

Table 9: The disclosure quality–performance relationship conditional on GRI adoption

This table presents results from a 2SLS estimation, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. The results indicate that, conditional on GRI adoption, disclosure quality is not associated with performance. However, disclosure quality is positively and significantly associated with performance conditional on non-adoption. The dependent variable is ESG performance with the sample restricted to GRI adopters (Column 1) and nonadopters (Column 2). All other variables are defined in Appendix A. Robust standard errors in parentheses. ***, **, and * indicate $p<0.01$, $p<0.05$, $p<0.1$, respectively, using two-tailed tests.

Dependent Variable:	[1] PERF	[2] PERF
DQUAL	0.220	1.253***
	(0.44)	(0.20)
ROA	9.643	-0.518
	(10.82)	(3.70)
LEV	-0.042	2.833
	(5.78)	(2.22)
MTB	-2.113**	-0.365
	(0.96)	(0.83)
SIZE	2.778	-1.187
	(2.74)	(1.00)
CASH	-0.341	6.375
	(5.25)	(5.30)
CFO	1.778	-21.808***
	(10.89)	(6.63)
R&D	904.116	154.825
	(599.64)	(269.87)
ADVERTISING	10,135.581***	6,305.403
	(2,288.63)	(3,947.81)
LITIGATION	0.000	0.000
	(0.00)	(0.00)
GOVNCESCORE	0.327***	0.245***
	(0.05)	(0.04)
Observations	258	1,407
Year FE	Yes	Yes

Table 10: The effect of GRI application levels

This table presents results from a 2SLS estimation of the simultaneous equation system, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. The results indicate a statistically significant positive association between GRI application levels and ESG disclosure quality (after controlling for performance), but not performance (after controlling for disclosure quality). The dependent variables are ESG disclosure quality (Columns 1a–3a) and ESG performance (Columns 1b–3b). *GRI_high_low* is equal to 1 if an observation indicates the highest level of GRI application, and 0 if an observation does not indicate GRI adoption (Columns 1a, 1b); *GRI_high_low* is equal to 1 if an observation indicates any but the highest level of GRI application, and 0 if an observation does not indicate GRI adoption (Columns 2a, 2b); *GRI_high_low* is equal to 1 if an observation has the highest level of GRI application, and 0 if an observation has any other level of GRI application (Columns 3a, 3b). All other variables are defined in Appendix A. Robust standard errors in parentheses. ***, **, and * indicate p<0.01, p<0.05, p<0.1, respectively, using two-tailed tests.

Dependent Variable:	[1a] DQUAL	[2a] DQUAL	[3a] DQUAL	Dependent Variable:	[1b] PERF	[2b] PERF	[3b] PERF
PERF	0.291***	0.363***	0.208	DQUAL	0.354	-0.036	0.139
	(0.09)	(0.07)	(0.22)		(0.30)	(0.34)	(0.39)
GRI_high_low	17.236***	9.205***	5.367**	GRI_high_low	0.065	3.265	2.842
	(2.67)	(1.33)	(2.39)		(5.60)	(3.72)	(2.87)
ROA	12.681**	12.204**	18.009**	ROA	12.333**	13.289**	10.721
	(6.06)	(5.17)	(7.17)		(5.35)	(5.70)	(10.00)
LEV	-10.239***	-8.679**	-9.367	LEV	6.128	0.882	-0.111
	(3.66)	(3.47)	(6.04)		(4.00)	(4.03)	(5.31)
MTB	-0.340	-0.201	-1.570	MTB	-2.475**	-2.953***	-2.344**
	(1.12)	(0.90)	(1.89)		(1.08)	(1.07)	(1.02)
SIZE	2.384***	2.547***	5.021***	SIZE	2.554**	3.645***	2.848
	(0.63)	(0.61)	(1.58)		(1.24)	(1.35)	(2.06)
FIN	-1.505	1.055	6.996	CASH	23.544***	19.961**	0.327
	(4.67)	(4.12)	(6.64)		(8.16)	(7.68)	(5.65)
VOLAT	-5.132	-1.355	-2.864	CFO	-22.349**	-6.971	0.305
	(8.66)	(8.17)	(13.75)		(8.80)	(8.63)	(10.41)
ASSETNEW	-9.294**	-7.092**	-8.304	R&D	1,186.213***	1,582.737***	1,126.695*
	(3.86)	(3.46)	(5.92)		(379.49)	(437.36)	(657.85)

CAPINTENSITY	2.681*	2.861***	2.026	ADVERTISING	6,771.783	6,220.057**	9,019.667***
	(1.42)	(1.06)	(1.35)		(4,231.92)	(3,010.56)	(2,744.55)
CONTROVSCORE	-0.008	0.004	0.032	LITIGATION	0.000	-0.000	0.000
	(0.02)	(0.02)	(0.03)		(0.00)	(0.00)	(0.00)
				GOVNCESCORE	0.336***	0.389***	0.333***
					(0.04)	(0.05)	(0.04)
Observations	640	764	258	Observations	640	764	258
Year FE	Yes	Yes	Yes	Year FE	Yes	Yes	Yes

Table 11: The effect of governance mechanisms

This table presents results from a 2SLS estimation, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. The results indicate that the presence of an ESG committee as well as ESG disclosure assurance are positively and significantly associated with ESG disclosure quality and GRI adoption. The dependent variables are ESG disclosure quality (Column 1) and GRI adoption (Column 2). All variables are defined in Appendix A. Robust standard errors in parentheses. ***, **, and * indicate p<0.01, p<0.05, p<0.1, respectively, using two-tailed tests.

	[1]	[2]
Dependent Variable:	DQUAL	GRI
PERF	0.309***	0.004**
	(0.06)	(0.00)
COMM	4.576***	0.082***
	(0.92)	(0.02)
RESPONSIBILITY	-2.436	0.144
	(2.02)	(0.10)
COMP	1.021	0.022
	(0.84)	(0.02)
ASSUR	13.498***	0.361***
	(2.00)	(0.07)
ROA	7.549***	-0.066
	(2.79)	(0.09)
LEV	-2.381	-0.106
	(2.02)	(0.08)
MTB	0.414	0.025
	(0.51)	(0.02)
SIZE	2.430***	-0.017
	(0.46)	(0.02)
FIN	-2.279	-0.029
	(1.91)	(0.07)
VOLAT	3.829	0.439**
	(5.61)	(0.20)
ASSETNEW	-5.422**	0.071
	(2.55)	(0.07)
CAPINTENSITY	0.514	-0.001
	(0.53)	(0.01)
CONTROVSCORE	-0.011	-0.000
	(0.02)	(0.00)
Observations	1,665	1,665
Year FE	Yes	Yes

Table 12: The effect of GRI adoption and the presence of an ESG committee

This table presents results from a 2SLS estimation, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. The results indicate that GRI adoption, the presence of an ESG committee, and ESG assurance are associated with disclosure quality incrementally and independently (i.e., there is no interaction among these variables). The dependent variable is ESG disclosure quality. All variables are defined in Appendix A. Robust standard errors in parentheses. ***, **, and * indicate p<0.01, p<0.05, p<0.1, respectively, using two-tailed tests.

	[1]
Dependent Variable:	DQUAL
PERF	0.269***
	(0.05)
GRI	16.284***
	(5.22)
COMM	3.606***
	(0.87)
ASSUR	9.615***
	(1.51)
GRI*COMM	-4.415
	(5.27)
GRI*ASSUR	-0.787
	(2.24)
ROA	8.397***
	(2.32)
LEV	-1.133
	(1.77)
MTB	0.087
	(0.46)
SIZE	2.668***
	(0.41)
FIN	-1.899
	(1.67)
VOLAT	-1.051
	(4.82)
ASSETNEW	-6.222***
	(2.18)
CAPINTENSITY	0.511
	(0.47)
CONTROVSCORE	-0.010
	(0.01)
Observations	1,665
Year FE	Yes

Table 13: The incremental effect of non-GRI frameworks

This table presents results from a 2SLS estimation of the simultaneous equation system, with standard errors of the coefficients clustered at the firm level and with year-fixed effects. The results indicate that U.N. Global Compact adoption is positively and significantly associated with disclosure quality (after controlling for performance) and is negatively and significantly associated with performance (after controlling for disclosure quality). The dependent variables are ESG disclosure quality (Column 1) and ESG performance (Column 2). All other variables are defined in Appendix A. Robust standard errors in parentheses. ***, **, and * indicate $p<0.01$, $p<0.05$, $p<0.1$, respectively, using two-tailed tests.

Dependent Variable:	[1] DQUAL	Dependent Variable:	[2] PERF
PERF	0.340***	DQUAL	1.383***
	(0.05)		(0.26)
GRI	13.253***	GRI	-14.196***
	(1.18)		(4.37)
UNGC	7.061***	UNGC	-8.324**
	(2.17)		(3.39)
INTEGRATED	2.774	INTEGRATED	-3.449
	(4.33)		(5.69)
SDG	-1.394	SDG	3.340
	(1.54)		(2.08)
ROA	9.934***	ROA	-1.910
	(2.35)		(4.19)
LEV	-3.405*	LEV	3.471
	(1.75)		(2.45)
MTB	-0.306	MTB	-0.166
	(0.50)		(0.92)
SIZE	2.959***	SIZE	-1.900
	(0.44)		(1.25)
FIN	-1.299	CASH	5.323
	(1.63)		(5.37)
VOLAT	1.164	CFO	-21.933***
	(5.14)		(7.25)
ASSETNEW	-6.482***	R&D	119.400
	(2.17)		(297.94)
CAPINTENSITY	0.277	ADVERTISING	6,760.150
	(0.45)		(4,278.73)
CONTROVSCORE	-0.013	LITIGATION	0.000
	(0.01)		(0.00)
		GOVNCESCORE	0.223***
			(0.05)
Observations	1,665	Observations	1,665
Year FE	Yes	Year FE	Yes