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(Citation)
Journal of Cleaner Production,322:129027

(Issue Date)
2021-11-01

(Resource Type)
journal article

(Version)
Version of Record

Journal of Cleaner Production 322 (2021) 129027

Contents lists available at ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

# Motivations for voluntary corporate adoption of integrated reporting: A novel context for comparing voluntary disclosure and legitimacy theory

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ARTICLE INFO

Handling Editor: Dr. Govindan Kannan

*Keywords:*
Integrated reporting
Sustainability reporting
Voluntary reporting motivations
Voluntary disclosure theory
Legitimacy theory

ABSTRACT

The swift development of integrated reporting as a genre within corporate reporting and the rapid spread of organizations adopting the International Integrated Reporting Council's (IIRC) vision for such shows that corporate voluntary reporting is now moving to a new stage. This provides an opportunity for companies to refine or reveal their hitherto hidden voluntary reporting philosophy by adapting their reporting practices. The motivations for adopting integrated reporting could differ from the legitimation motivations the literature has previously considered to underlie broader social and environmental sustainability reporting. For this reason, this study explores the motivations for companies to shift to integrated reporting or to continue with social and environmental sustainability reporting in terms of voluntary disclosure and legitimacy theory. The analysis employs survival analysis conducted using data from companies listed on the Tokyo and London stock exchanges to explore the relationships between social and environmental performance and the timing and duration of a shift to integrated reporting. The results reveal different motivations underlying voluntary reporting practices between the two countries and across industry sectors. Overall, the findings suggest that the financial transparency and accountability role of integrated reporting proposed by the IIRC has gained traction among Tokyo but not London listed companies. However, there is a trend towards accountability in the shift to integrated reporting consistent with voluntary disclosure theory even for London listed companies at the industry sector level. This supports the view that companies have an incentive to differentiate their voluntary reporting philosophy through different forms of reporting and that legitimacy theory and voluntary disclosure theory are compatible in this regard.

## 1. Introduction

A rich academic literature examining the motivations for voluntary corporate reporting has developed in recent decades (Bebbington et al., 2014; Deegan and Unerman, 2011), mostly concerned with evolving social and environmental sustainability reporting practices and legitimacy theory (Alrazi et al., 2015; Lindblom, 1993; Suchman, 1995). The background to this literature is that industrialization has negatively impacted society and the natural environment. This results in the increasing demand for sustainability (Awan et al., 2018), defined as "[meeting] the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, para 27), with an emerging consensus that sustainability incorporates three dimensions, namely, the social, the environmental, and the economic (Haugh and Talwar, 2010). Because companies have a corporate social responsibility (CSR) combined with specific skills and resources for innovation in society and the environment, the expectation is that they will play a primary role in achieving sustainability (Cheng et al., 2021; Scheyvens et al., 2016). In response, many companies link sustainability to their business.[1] Within such an explanatory framework, the motivation for voluntary social and environmental sustainability disclosures (e.g., CSR reporting) represent a managerial desire to build, support, or repair the legitimacy with which an array of politically and economically powerful stakeholders regard a reporting organization (Deegan, 2002, 2014).

Long dismissed by these studies is the alternative of voluntary

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[1] For example, a varied degree of competencies in the product life cycle is required to ensure and improve environmental performance (Awan et al., 2020).

https://doi.org/10.1016/j.jclepro.2021.129027
Received 28 March 2021; Received in revised form 23 August 2021; Accepted 13 September 2021
Available online 20 September 2021

disclosures motivated by a managerial desire to be more fully financially accountable to investors, namely, shareholders and long-term creditors, although no social, environmental, or economic sustainability, even at the company level, can be intrinsically sacrificed to achieve full sustainability (Awan et al., 2019; Elkington, 2004). Thus, the role of corporate voluntary reporting is if anything to secure legitimacy, and so the practices and motivations to discharge financial accountability to investors differ from the social, environmental, and economic accountability to a broader range of stakeholders (Adams, 2004; Arunachalam and McLachlan, 2015).

Over the past decade, following an expansion in environmental, social, and governance investment and the foundation in 2010 of the International Integrated Reporting Committee, later renamed the International Integrated Reporting Council (IIRC), a new voluntary reporting initiative for integrated reporting has rapidly gained traction (de Villiers et al., 2014). The IIRC's vision of integrated reporting seeks to incorporate the reporting of the social, environmental, and economic sustainability factors that are of most relevance to an organization's long-term financial performance, primarily to help inform the investment decisions made by long-term investors (Humphrey et al., 2017).

Thus, integrated reporting can improve the quality of information in terms of covering all three dimensions of sustainability at the company level. However, while integrated reporting overlaps with important broader aspects of social and environmental sustainability reporting, there is a key difference in that there is a more explicit and narrow focus on long-term financial stakeholders (investors), not on merely securing legitimacy from other stakeholders. In doing so, integrated reporting supplies information about social and environmental impacts likely to be material to an organization's longer-term financial results, rather than the broader range of impacts addressed in social and environmental sustainability reporting.

The rapid development of integrated reporting as a new genre within corporate reporting, and the rapid spread of organizations adopting the IIRC's vision of integrated reporting suggests that corporate voluntary reporting is now moving to a new stage (Correa-Garcia et al., 2020; Perego et al., 2016). This may provide an opportunity for companies, especially those with differing motivations for voluntary reporting, to refine or reveal their hitherto (hidden) voluntary reporting philosophy by adapting their reporting practices. The coexistence of the IIRC's framework for integrated reporting and Global Reporting Initiative (GRI) standards for social and environmental sustainability reporting supports such a refinement in the demand for both integrated reporting and social and environmental sustainability reporting.

Because companies with motivations to discharge financial accountability to investors could not previously reveal their reporting philosophy through social and environmental sustainability reporting, the potential motivations (other than rhetorical legitimation) underlying voluntary reporting may now become clear. Indeed, data collected as part of this study suggest that many companies replace social and environmental sustainability reporting with integrated reporting, rather than adopting integrated reporting in addition to social and environmental sustainability reporting. This may be a sign of the differentiation of reporting philosophy. If not, there is a potential distortion of the primary purpose of integrated reporting by its users, suggesting that the IIRC's vision for integrated reporting is as yet unresolved.

Unfortunately, there is currently little evidence addressing this, with existing studies analysing social and environmental sustainability reporting from a legitimacy perspective and only clarifying part of the role of voluntary corporate reporting. Because these account for most studies analysing voluntary corporate reporting in accounting research and given the equal lack of attention to the financial accountability role, they may have misinterpreted the role of voluntary corporate reporting. Indeed, the legitimating role clarified by earlier studies cannot address the reality that environmental, social, and governance information has recently become as important as financial information for investment decisions, especially in the era of the United Nations' Sustainable Development Goals (Nishitani et al., 2020). This implies an underestimation of the required role of company voluntary reporting by the literature, in the sense that the financial accountability and legitimating roles should not intrinsically conflict.

To address this gap in the research, this study examines voluntary reporting philosophy and practices in a unique environment, and in doing so supplies novel insights about the hidden motivations underlying voluntary reporting. In developing these insights, the goal is to learn the apparent primary motivation for companies to shift to integrated reporting or to continue with social and environmental sustainability reporting. This enables us to expose the hidden voluntary reporting philosophy of companies, which they reveal by adapting their reporting practices. This serves as the primary novelty of this study.

In our analysis, we consider that a company's voluntary reporting philosophy is expressed in a combination of: (i) a managerial desire to be financially accountable to the primary target audience of integrated reports, namely, investors, and (ii) managerial concerns over ensuring legitimacy with a broader range of politically and economically powerful stakeholders. To help learn the motivations derived for companies to shift to integrated reporting or continue with social and environmental sustainability reporting, we assess the consistency of these hypotheses with both voluntary disclosure theory and legitimacy theory following existing studies in the area. For example, de Villiers and van Staden (2011) found that companies used different reporting media (i.e., annual reports or websites) depending on their environmental performance.

The hypothesis relating to voluntary disclosure theory could reveal financial accountability to investors as the motivation for engaging in voluntary reporting (e.g., Al-Tuwaijri et al., 2004; Bewley and Li, 2000; Clarkson et al., 2008; Cormier and Magnan, 1999; Dye, 1985; Lang and Lundholm, 1993; Magness, 2006; Verrecchia, 1983). In contrast, the hypothesis consistent with legitimacy theory could suggest that rhetorical legitimation to a broader range of politically and economically powerful stakeholders is the primary motivation for voluntary reporting (e.g., Cho and Patten, 2007; Cho et al., 2012; Clarkson et al., 2011; Deegan, 2002; Gray et al., 1995; Guidry and Patten, 2012; O'Donovan, 2002; Patten, 2002; Wilmshurst and Frost, 2000).

In turn, where companies have proactively incorporated social and environmental factors into their strategy for improving long-term financial performance and understand and manage the interrelating risks and opportunities, the motivation to shift to integrated reporting would be consistent with voluntary disclosure theory (Stacchezzini et al., 2016). At the same time, where companies continue with existing social and environmental sustainability reporting, the motivation for voluntary reporting would be consistent with legitimacy theory (as supported by the extant literature). Otherwise, integrated reporting could be just a developed form of existing social and environmental sustainability reporting (and thereby deviating from its primary purpose). From a legitimacy perspective, "[integrated reporting] is a [discretionary] disclosure choice and, as such, it may represent a reporting [initiative] to manage corporate legitimacy" (Lai et al., 2016, p.165).

According to the literature, voluntary disclosure theory predicts a positive relationship between social and environmental performance and its reporting, while legitimacy theory envisages a negative relationship. This suggests that social and environmental performance is an important determinant of corporate voluntary reporting in both theories. Thus, using both theories to analyse the relationships between social and environmental performance and integrated or social and environmental sustainability reporting can help clarify the roots of the movement in corporate voluntary reporting in a novel context.

Although earlier empirical studies suggest that legitimacy theory is a more reasonable explanation of the role of existing social and environmental sustainability reporting practices, companies can refine or uncover their (hidden) voluntary reporting philosophy between financial accountability and rhetorical legitimation by adapting their reporting

practices. Indeed, voluntary disclosure theory would be a more reasonable explanation of the role of integrated reporting where the motivation of a company for financial accountability to its investors is a commitment to the principles underlying the IIRC's integrated reporting framework. As such, the focus of this study is more on the reporting philosophy than on the mere adoption of integrated or social and environmental sustainability reporting. Fig. 1 portrays the conceptual framework applied in the analysis.

To assess the motivations underlying any shift to integrated reporting compared with a continuation of social and environmental sustainability reporting, we conduct a *survival analysis* of the relationship between social and environmental performance and the hazard rate. The hazard rate here is the probability of the timing and duration of a company shifting to integrated reporting where social and environmental sustainability reporting was the company's usual reporting practice. Thus, the survival analysis is not just about whether but when a company adopts integrated reporting. As companies decide when to adopt integrated reporting, they have an incentive to continue with it, regardless of whether they replace or compensate sustainability reporting with integrated reporting. This is consistent with the argument that it is unrealistic for companies to frequently change their voluntary reporting philosophy. The intrinsic determinant is the timing of first adoption (Nishitani, 2009) not adoption per se, and therefore the limited dependent variable models (probit and logit) common in the literature are not suitable.

For our analysis, we collect data from the 100-largest companies listed on each of the Tokyo and London stock exchanges from 2012 to 2017 and correct for any latent selection bias associated with sampling only the largest companies in each market using the inverse Mills ratio as the correction term. The motivation for the sample selection of Tokyo and London listed companies is the longstanding tradition of corporate social and environmental sustainability reporting (and the underlying engagement with CSR) in both countries. As we expect integrated reporting to reflect, at least in part, the consequences of a company's economic performance on its social and environmental impact, its early development and adoption in Japan and the UK could draw upon an existing sustainability reporting skills base that have made it quick and easy to implement.

In contrast, in, say, the US where there is a much less developed tradition of social and environmental sustainability reporting (Dilling and Harris, 2018), we expect integrated reporting to require much greater advances in the underlying reporting skills, and thus a potentially longer gestation period. Further, while there are major corporate cultural differences between the two countries, such as those in corporate governance systems, we consider that a comparison between Japanese and UK integrated reporting practices is proper given the similarities in context as developed market-based economies (Hofstede, 2001, but also Frias-Aceituno et al., 2013; McSweeney, 2002a, 2002b; Yonekura et al., 2012). Lastly, Japanese reporting practices have the unique feature that social and environmental sustainability reporting in annual reports has never been common, and this serves as a suitable contrast with experience in the UK.

The findings show that there are different motivations underlying voluntary reporting practices both between the two countries and across industry sectors. Overall, it would appear that the primary sustainability-related financial transparency and accountability role of integrated reporting proposed by the IIRC has gained traction among Tokyo but not London listed companies. However, we also reveal a trend toward an accountability motivation in the shift to integrated reporting consistent with voluntary disclosure theory, even for London listed companies at the industry sector level. These findings support the view that companies have an incentive to differentiate their voluntary reporting philosophy by different forms of reporting, and that legitimacy theory and voluntary disclosure theory are compatible in this regard.

The remainder of the paper is organized as follows. Section 2 provides an overview of integrated reporting. Section 3 presents the theoretical framework, reviews the literature, and develops the hypotheses. Section 4 explains the research design and Section 5 details the empirical results. Section 6 presents the conclusion, discusses some limitations of the study, and suggests some directions for future research.

## 2. Development of integrated reporting

Since the beginning of the 21st century, *sustainability reporting* has become a term widely used to describe the self-reporting of a company's social and environmental policies, practices, and performance, including any associated risks and opportunities. Although we can trace elements of social and environmental reporting back as far as the 19th century (Guthrie and Parker, 1989), social and environmental reporting became much more common towards the end of the 20th century. Developments in social and environmental reporting in the 1990s saw an increasing number of companies devoting part of their annual financial report to the disclosure of information on social and environmental matters affecting the company. As social and environmental reporting became more sophisticated, and companies addressed a wider range of issues within their reporting, the space devoted to social and environmental information within the annual financial report expanded.

Increasingly, companies began to publish social and environmental information in separate reports, with these reports now commonly known as sustainability reports (de Villiers et al., 2014). This enabled the annual financial report to focus primarily on financial performance and risk information aimed at investors, with minimal social and environmental sustainability information. In contrast, the sustainability report became longer and more detailed, and tended to aim at addressing the information needs of a broad range of politically and economically powerful stakeholders (Jensen and Berg, 2012). While sustainability reports have now become a common medium for sustainability reporting, some companies have continued to use annual reports to reveal their social and environmental impact information (Michelon et al., 2015).

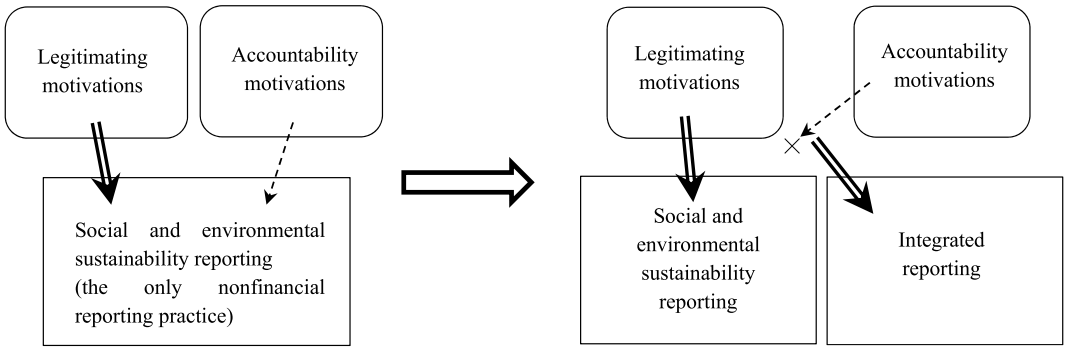


**Fig. 1.** Motivations for the shift to integrated reporting.

Over the past few years, advocates of integrated reporting have argued that the decisions of investors would be improved by the provision within a single primary corporate report of concise information integrating a company's social, environmental, and financial performance and their impact (Eccles and Krzus, 2010). A key purpose of the development of integrated reporting has been to provide this concise integrated picture (International Integrated Reporting Council IIRC, 2013).

In practice there are three main foundations of integrated reporting. At the organizational level, the Danish pharmaceutical company Novo Nordisk pioneered an integrated approach with its own reporting in the early years of the 21st century (de Villiers et al., 2014). At the country level, South Africa pioneered and championed integrated reporting, requiring all companies with shares listed on the Johannesburg Stock Exchange to either publish an integrated report or explain why they had not (Cheng et al., 2014). South African regulations for integrated reporting initially saw it aimed at meeting the information needs of an extremely broad range of stakeholders, not just investors or the most important stakeholders. At the international level, since 2010 the IIRC has championed the development and fostered the rapid and geographically widespread adoption of an integrated reporting framework aimed at meeting the information needs of investors (de Villiers et al., 2014; International Integrated Reporting Committee IIRC, 2011; 2013; Rinaldi et al., 2018). Although only published in 2013, the IIRC first introduced the basic elements of its integrated reporting framework in a 2011 discussion paper (International Integrated Reporting Committee IIRC, 2011; 2013).

Through the IIRC's initiatives, integrated reporting has now become prominent as a new form of (mainly) voluntary corporate reporting for the disclosure of financial and nonfinancial information to investors, including the social and environmental sustainability information likely to affect longer-term financial performance (International Integrated Reporting Council IIRC, 2016). As the IIRC has dominated these developments globally, and given that the experience of Novo Nordisk and South Africa were later and differ from the IIRC's approach to integrated reporting, we consider the IIRC's integrated reporting framework to be most relevant to the aims of this study.

According to the IIRC, the widespread adoption of its vision for integrated reporting is expected to:

> [1] improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital; [2] promote a more cohesive and efficient approach to corporate reporting that draws on different reporting strands and communicates the full range of factors that materially affect the ability of an organization to create value over time; [3] enhance accountability and stewardship for the broad base of capitals (financial, manufactured, intellectual, human, social and relationship, and natural) and promote understanding of their interdependencies; [4] support integrated thinking, decision-making and actions that focus on the creation of value over the short, medium and long term (International Integrated Reporting Council IIRC, 2013, p.2).

In this manner, integrated reporting serves as a new form of reporting to address the suggested weakness of narrower financial reporting, such as a lack of responsiveness to new value drivers and a changing business context (Adams and Simnett, 2011; Stubbs and Higgins, 2014). Thus, the IIRC expects integrated reporting to contribute to improving the longer-term economic/financial decision-making of investors.

## 3. Theoretical and empirical literature and hypothesis development

This section first explains our theoretical framework using voluntary disclosure theory and legitimacy theory. It then reviews studies that have analysed the related fields of social and environmental sustainability reporting using these theories. Lastly, it draws on insights from theory and practice in developing hypotheses about the motivations for companies shifting to integrated reporting where social and environmental sustainability reporting had been their usual practice.

### 3.1. Theoretical framework

Voluntary disclosure theory and legitimacy theory are among the most widespread theories used in empirical studies of corporate voluntary reporting (Hahn and Kühnen, 2013). In what follows, we explain the key aspects of voluntary disclosure theory and legitimacy theory. Voluntary disclosure theory as it applies in the social and environmental sustainability reporting literature is rooted in the financial disclosure literature, with Verrecchia (1983) and Dye (1985) arguing about the role of proprietary costs and uncertainty, respectively.

Voluntary disclosure theory was originally a special case of game theory (Dye, 2001) and follows the premise that companies will provide favourable information (i.e., good news) and withhold unfavourable information (i.e., bad news) (Dye, 2001; Verrecchia, 1983). To effectively interpret the motivation of a company making or withholding disclosures, investors should then expect the company has incentives to behave in this manner (Dye, 2001). If investors interpret withholding (or nondisclosure) as a sign of the existence of unfavourable information, the company's share price will fall, so companies with favourable information have an incentive to disclose this information to increase market value (Depoers, 2000; Kent and Ung, 2003).

However, because a proprietary cost associated with disclosing information (i.e., a reduction in future cash flows attributable to the disclosure) can occur where competitors gain benefit from information in the disclosure, investors may be uncertain about whether information is withheld to avoid reporting bad news or to avoid incurring proprietary costs despite the information withheld containing good news (Cheng, 2017; Depoers, 2000; Dye, 1985, 2001, 2001; Skinner, 1994; Verrecchia, 1983).[2] Thus, a proprietary cost increases the range of interpretations for nondisclosure in conditions of investor uncertainty about what has occurred within a company, and there is no longer an unambiguous implication that the withheld information is unfavourable (Craswell and Taylor, 1992).

The nature of these proprietary costs decides the threshold level of disclosure where a company only discloses information above the threshold and otherwise withholds it (Lang and Lundholm, 1993; Verrecchia, 1990). This characterizes a partial disclosure equilibrium in which a company follows a strategy of disclosing only successes. Therefore, a higher (lower) proprietary cost is associated with a lower (higher) level of voluntary disclosure in conditions of investor uncertainty about what has occurred within a company, because the disclosure may increase the risk of being vulnerable to competitors (Rezaee and Tuo, 2017).

Voluntary disclosure theory within the financial reporting literature focuses on the provision of financial rather than social and environmental information, so it has had to be adapted for use in analysing social and environmental sustainability reporting where: (i) there is information asymmetry between companies and investors, and (ii) there are potential proprietary costs associated with the disclosure of social and/or environmental information (Guidry and Patten, 2012). Within the social and environmental sustainability reporting literature (e.g., Al-Tuwaijri et al., 2004; Clarkson et al., 2008) we modify the notions within voluntary disclosure theory to enable empirical statistical analysis in the social and environmental sustainability context, which theorizes that better (worse) environmental performance incurs lower

[2] Proprietary costs are a plausible reason for why not all companies disclose information.

(higher) proprietary cost under conditions of uncertainty.

Voluntary disclosure theory as applied to social and environmental sustainability contexts suggests that the motivation for companies to use social and environmental sustainability reporting is to aid improved decision-making by their investors. Voluntary disclosure theory assumes companies that have achieved better financially impactful social and environmental performance have an incentive to disclose this information to differentiate themselves from those that have not had to reduce the asymmetric information between the company and its investors (Clarkson et al., 2008; Li et al., 1997).

This aligns with Lang and Lundholm's (1993, p.247) suggestion that companies have motivations for corporate reporting, such as "… overcoming adverse selection [and] reducing transaction costs in the market". Such behaviour is reasonable where investors evaluate corporate social and environmental performance, not directly, but indirectly through disclosed information, and where the achievement of better social and environmental performance potentially provides economic/financial benefits for the reporting organization. These potentially include an increase in customer demand by showing consideration for society and/or the environment, an improvement in production efficiency via improving management control, and/or a reduction of the environmental risks to which companies may expose themselves in the future (Nishitani, 2011).

Voluntary disclosure theory as applied to social and environmental sustainability disclosures therefore proposes that a company's primary focus for corporate sustainability reporting is on the possible or probable financial performance benefits from its improved social and environmental performance, rather than on broader aspects of social and environmental sustainability (Adams, 2004). That is, financial accountability and transparency through corporate reporting are critical elements required for capital markets to function efficiently (Healy and Palepu, 2001). In practice, providers of financial capital can infer the longer-term financial impacts, risks, and opportunities arising from social and environmental performance, such as lower latent environmental liabilities, by evaluating the information disclosed (Bewley and Li, 2000; Clarkson et al., 2008).

Thus, from the perspective of voluntary disclosure theory, companies that have achieved better financially impactful social and environmental performance can potentially increase their market valuation by disclosing social and environmental information, especially objective types of information that are difficult to mimic by companies that have not achieved such good levels of performance (Al-Tuwaijri et al., 2004; Bewley and Li, 2000; Clarkson et al., 2008). Conversely, financial markets may potentially judge companies that have not disclosed financially beneficial social and environmental sustainability information as ''average-type'' companies that have not gained financial advantages associated with social and environmental performance (Clarkson et al., 2008).

Given the above arguments, voluntary disclosure theory predicts a positive relationship between social and environmental performance and its reporting (Clarkson et al., 2008, 2011). Where there is such a positive relationship, voluntary disclosure theory suggests that managers disclose social and environmental sustainability information given a desire to provide financial transparency (and accountability) to their investors for enhancing their financially impactful social and environmental performance.

In contrast, legitimacy theory assumes that a company has no inherent right to exist, but this right is conferred upon it by society through a social contract where a company performs various socially desired actions in return for approval of its objectives, other rewards, and its ultimate survival (Deegan, 2002; Guthrie and Parker, 1989; Magness, 2006, 2008):

[A]ny social institution [including a company] operates in society via a social contract, expressed or implied, whereby its survival and growth are based on: (1) the delivery of some socially desirable ends to society in general, and (2) the distribution of economic, social, or political benefits to groups from which it derives its power (Shocker and Sethi, 1973, p.97).

In short, legitimacy theory stresses how a company will react to society's expectations (Wilmshurst and Frost, 2000). Where a company is successful in meeting, or perceived as meeting, its social contract, it leads to a congruence between the company and society (Cormier and Gordon, 2001). Thus, legitimacy theory is reactive (Guthrie and Parker, 1989).

Central to the concept of legitimacy are the perceptions held by relevant parts of the public and by society at large (Aerts and Cormier, 2009). Deephouse and Carter (2005, p.331) explain that a fundamental element of legitimacy is "… meeting and adhering to the expectations of a social system's norms, values, rules, and meanings". Legitimacy theory argues that companies use social and environmental disclosure as a (social) legitimating tool to create an impression (that may or may not reflect underlying performance) that the company operates in a manner that meets the social and environmental expectations (delivering the social contractual rights) of stakeholders who have political and economic power over the company (Lindblom, 1993). Legitimacy theory therefore focuses upon a company's exposure to its social and political environment, rather than its stock market context (Cho et al., 2012; Patten, 1991, 2000). In short, legitimacy theory focuses on how corporate management will react to societal perceptions (Wilmshurst and Frost, 2000).

Because legitimacy theory is based on the notion of a social contract, if politically and economically powerful members of society perceive that a company has breached the implicit terms of its social contract, it may threaten its survival (Cho et al., 2012; Deegan, 2002; Deegan et al., 2002). Indeed, Deegan (2002, p.293) suggests that "… where society is not satisfied that [a company] is operating in an acceptable, or legitimate, manner, then society will effectively revoke [the company's] 'contract' to continue its operations". This could be through consumers reducing their demand for the company's products or services, and/or by nongovernment organizations lobbying for legislation that would impact upon the cash flow of the company (Magness, 2006). Therefore, social and environmental disclosure may be used "… to reinforce the [society's] perception of management's responsiveness to specific [social and] environmental issues, or alternatively to divert attention from adverse [social and] environmental situations" (Wilmshurst and Frost, 2000, p.11).

According to Lindblom (1993), from the perspective of environmental legitimacy, companies may use environmental reporting as a legitimizing device to: (i) educate and inform relevant publics about (actual) changes in their environmental impacts that have been made to conform with changed social expectations, (ii) change perceptions about their environmental initiatives without changing operations, (iii) deflect attention from the issue of concern by highlighting other positive accomplishments, or (iv) seek to change public expectations about reasonable levels of environmental impacts and risk. Thus, if companies suspect a threat to their social and/or political legitimacy, they have an incentive to actively disclose social and environmental information to offset negative impacts that may be detrimental to their reputation and ongoing survival (Clarkson et al., 2008; Deegan, 2002; Patten, 2000, 2002). In the final three of Lindblom's (1993) legitimation strategies, the rhetoric of the social and environmental disclosures may then be different from any underlying reality.

In statistical studies, because legitimacy is not directly observable, it is common for researchers to infer legitimation processes and effects by analysing relationships between observable corporate performance variables, including social and environmental performance and social and environmental reporting (Aerts and Cormier, 2009). For most legitimation strategies, legitimacy theory (at least in the field of sustainability reporting) predicts a negative relationship between social and environmental performance and its reporting (Cho et al., 2012; Clarkson et al., 2011).

The argument for this is that as the expectations evolve of politically

and economically powerful stakeholders regarding corporate social and environmental performance, companies that do not meet these expectations face threats to their legitimacy (Clarkson et al., 2011). That is, companies performing poorly on social and environmental factors face more social and political (or regulatory) pressures and threatened legitimacy (and thus a greater likelihood of costly regulatory actions against them) (Cho et al., 2012). Accordingly, social and environmentally poorly performing companies are more likely to attempt to increase discretionary social and environmental disclosures to change politically and economically powerful stakeholders' perceptions about their actual performance in order to reduce exposures to these social and political pressures (Cho and Patten, 2007).

### 3.2. Empirical literature and hypothesis development

Several studies in social and environmental reporting research in the field of sustainability accounting have empirically analysed the role of sustainability reporting from the viewpoint of voluntary disclosure and legitimacy theory. Those that found a positive relationship between sustainability performance and reporting include Al-Tuwaijri et al. (2004),[3] Clarkson et al. (2008), and Silva–Gao (2012), whereas those that found a negative relationship include Bewley and Li (2000), Cho et al. (2012), Clarkson et al. (2011), Guidry and Patten (2012), Hughes et al. (2001), and Patten (2002).[4]

Bewley and Li (2000) found results inconsistent with voluntary disclosure theory, although they nevertheless appealed to this theory, while Hughes et al. (2001) concluded that environmental information differed between good, mixed, and poor environmentally performing companies, and that poor environmentally performing companies made the most disclosures, a finding consistent with legitimacy theory. Patten (2002) also provided results consistent with legitimacy theory, especially for companies in non-environmentally sensitive industries. Clarkson et al. (2008) analysed US companies and found results consistent with voluntary disclosure theory, while Clarkson et al. (2011) in an examination of Australian companies found results consistent with socio-political theories, with both studies employing the same proxy for environmental disclosure. This implies that the application of theories to explain the role of sustainability reporting may differ between countries.

Elsewhere, Guidry and Patten (2012) re-estimated the data used by Cho and Patten (2007) by considering that the control variables such as profitability and leverage used in previous studies had focused on voluntary disclosure theory. However, even after including control variables for voluntary disclosure theory, there was still support for legitimacy theory. Silva–Gao (2012) concluded a positive relationship for US companies between lower greenhouse gas (GHG) emissions and the amount of environmental capital expenditure information. This at least supports the role of voluntary disclosure theory in the relationship between specific environmental performance and reporting.

Studies that have empirically analysed the role of sustainability reporting practices from the perspective of voluntary disclosure theory and legitimacy theory have provided mixed results. Many obtained findings consistent with legitimacy theory rather than voluntary disclosure theory. However, the number of studies whose findings are consistent with voluntary disclosure theory has recently been increasing. Having said that, most have observed the (limited) relationship between specific environmental performance and reporting, which is consistent with the findings in Silva–Gao (2012).

For example, Giannarakis et al. (2016, 2017a, 2017b) revealed various environmental performance indicators such as GHG emissions, climate change policy, and emission reduction initiatives were positively associated with environmental disclosures. Kang and Gray (2019) found that British multinational companies were less likely to disclose their segment and risk information on a country-by-country basis if they conducted operations in countries with higher levels of country-specific risks. Abubakar Siddique et al. (2021) concluded that companies with better carbon performance were more likely to make more carbon disclosures.

Other than these studies, Acar and Temiz (2020) obtained results consistent with voluntary disclosure theory in an emerging market context and Uyar et al. (2020) found that companies with better CSR performance were more likely to publish one or more CSR reports. Similarly, Lu and Wang (2021) found that companies with better environmental performance disclosed more CSR information. In contrast, Yook et al. (2017) revealed a negative relationship between the disclosed levels of environmental control costs and eco-efficiency performance measures and Luo (2019) found a negative relationship between carbon emission performance and voluntary carbon disclosure. Cong et al. (2020) concluded a positive relationship existed between GHG emissions and the extensiveness of climate change disclosure, thereby supporting legitimacy theory. As a unique study, Li et al. (2017) found that the relationship between environmental performance and environmental disclosures exhibited a U-shaped nonlinear relationship, thereby eliminating the discrepancy between legitimacy and voluntary disclosure theory.

In addition, some studies distinguished between types of disclosure when empirically analysing the role of sustainability reporting. Clarkson et al. (2008) split environmental disclosures into hard disclosures (i.e., governance structure and environmental management systems, environmental performance indicators, and environmental spending) and soft disclosures (i.e., vision and strategy claims, environmental profile, and environmental initiatives) and concluded environmental performance was significantly positive for both hard and soft disclosures. Regardless of the type of disclosures, the findings supported voluntary disclosure theory. In contrast, Hummel and Schlick (2016) classified sustainability disclosures into high quality (in terms of verifiability, reliability, comparability, and consistency) and low quality, and found that companies with better sustainability performance disclosed more high-quality sustainability information whereas those with worse sustainability performance disclosed more low-quality sustainability information. Their findings indicated that voluntary disclosure theory and legitimacy theory simultaneously explained the disclosure quality of information within social and environmental sustainability reporting.

According to those studies with mixed results, companies might potentially have both a legitimation and financial accountability motivation for voluntary corporate reporting, and their reporting philosophy (or motivation) might then depend upon distinct types of reporting practices as Clarkson et al. (2008), Hummel and Schlick (2016), and de Villiers and van Staden (2011) proposed. In other words, they might use different reporting practices to differentiate their reporting philosophy. This is obvious from the findings (in assorted studies) that differing aspects of voluntary reporting support different motivations, such as the volume of content and type of information. However, we cannot clarify the multidimensionality of motivations underlying voluntary corporate reporting if an analysis focuses only on the volume of a report's contents. For that reason, where integrated reporting has appeared as a new form of voluntary corporate reporting for the disclosure of financial and nonfinancial information to investors, companies can refine their reporting philosophy more clearly than before by using integrated reporting and/or social and environmental sustainability reporting (depending on their reporting philosophy).

As suggested, many companies that have adopted integrated reporting have replaced their former publication of a social and environmental sustainability report with an integrated report. However, this does not mean that all companies have switched from social and environmental sustainability reporting to integrated reporting. Even where

[3] Although Al-Tuwaijri et al. (2004) do not explicitly refer to voluntary disclosure theory, their argument follows the theory.

[4] We omit studies analysing the influence of other factors on sustainability reporting from this review. Zhang and Liu (2020) and da Rocha Garcia et al. (2021) provide useful reviews.

some companies used both types of reporting practices at the same time, the possibility that these companies also had an incentive to refine their voluntary reporting philosophy through different reporting practices did not change. Companies may in fact have multiple motivations. Accordingly, we expect companies with financial accountability motivations to have an incentive to switch from existing social and environmental sustainability reporting to integrated reporting or, for some companies, an incentive to additionally adopt integrated reporting.

However, when analysing the motivations for voluntary corporate reporting in an unfamiliar environment, it is necessary to reflect on the applicability of prior data collection and analysis protocols rather than directly adopting the same methods, as these may not be suited to the different context (such as focusing on the volume of contents in a report). In the context of this study, this is because while voluntary integrated reporting shares certain characteristics with longer-standing social and environmental sustainability reporting, they each have a distinct focus as suggested. Furthermore, the following argument should be also considered.

First, the primary interest in many social and environmental sustainability reporting studies has been the extent (and type and quality) of relevant disclosures in any corporate report. This is because, when engaging in social and environmental sustainability reporting where such reporting has already become usual practice (e.g., Clarkson et al., 2008; Hummel and Schlick, 2016), companies can choose to include greater or lesser amounts of high- or low-quality social and environmental disclosures. In contrast, in the early development stages of integrated reporting (containing concise information), it was a reporting approach (or philosophy) that companies could either adopt or not (Lai et al., 2016). This finds support in the analysis by Eccles et al. (2019) of the sizes of some 50 selected integrated reports in 10 countries (i.e., Brazil, France, Germany, Italy, Japan, Netherlands, South Africa, South Korea, UK, and USA), where they found that the size of integrated reports in South Africa, where integrated reporting is mandatory, was much higher than average in the 10 countries, suggesting that *voluntary* integrated reporting practices were still developing.

In other work, Pistoni et al. (2018) investigated 116 integrated reports from the IIRC's website and found that integrated reporting quality was low, concluding that there was more attention given to the form of integrated reporting than its content. While some studies have analysed the volume of integrated reporting (e.g., Green and Cheng, 2019; Melloni et al., 2017), there may be sample selection bias in the results because only the practices of proactive companies with already published integrated reports were analysed, in a situation where integrated reporting had not yet become a reporting norm. Studies concerning South Africa, where integrated reporting is mandatory, are exceptional (e.g., Barth et al., 2017).

Second, because the IIRC's integrated reporting framework establishes general principles rather than specific guidelines, there is always flexibility for each company to define the content of their own report, which necessarily reduces the comparability of the disclosed information (Gianfelici et al., 2018). In addition, high-quality integrated reports should be concise and focused and therefore not exceedingly long (Hooks and van Sanden, 2011; International Integrated Reporting Council IIRC, 2013; Melloni et al., 2017), such that integrated reporting only provides "… an entry point to more detailed information outside the designated communication, to which it may be linked" (International Integrated Reporting Council IIRC, 2013).

Therefore, unlike social and environmental sustainability reporting, the volume of disclosures may not capture the essence of integrated reporting.[5] In other words, it is not always the case that the greater the extent of reporting, the higher the quality of reporting. This is reasonable from the background of the development of integrated reporting; while a company's sustainability report can contain considerable information about the company's social and environmental policies, practices, and performance, these reports have become very complex and long in order to meet the information needs of a wide range of stakeholders (Berthelot et al., 2003; Cho et al., 2010; Cormier et al., 2004; de Villiers et al., 2014). They also do not usually present an integrated picture of the interrelationships between financial, social, and environmental performance and risk—when in practice these factors are often highly interrelated (Jensen and Berg, 2012; Maas et al., 2016). Thus, providers of financial capital seeking to incorporate social and environmental factors into their investment decision-making needed to draw upon a range of sources of company-produced information (Epstein and Freedman, 1994; Harte et al., 1991; Rockness and Williams, 1988).

At first impression, examining integrated reporting practices using the extent or volume of disclosed information following the social and environmental and sustainability reporting literature might seem to be more appropriate. However, following such a conventional approach at this early stage of development of integrated reporting risks producing misleading results. Although we respect the methods used in previous social and environmental sustainability reporting studies, a unique way to avoid misleading results is necessary. Therefore, rather than comparing the detailed contents of each company's integrated and sustainability reports, our interest lies in the philosophy of corporate voluntary reporting, which depends on whether and when a company has shifted to the IIRC's integrated reporting or continues with its existing social and environmental sustainability reporting.[6] However, this does not mean our interest contradicts previous studies because some studies such as those of Clarkson et al. (2008) and Hummel and Schlick (2016) are also based on the difference in corporate reporting philosophy, although the focus of reporting practice differs.

From this perspective, and drawing on voluntary disclosure theory, if companies incorporate social and environmental impacts into their strategy and financial decision-making, and the associated financial and nonfinancial impacts are strategically beneficial for investors (Grassmann, 2021), companies with better social and environmental performance will have an incentive to shift to integrated reporting practices as soon as possible. It is important to consider the point of time of the shift in reporting because the sooner companies with a financial accountability motivation inform their investors through integrated reporting, the greater the financial advantage they can expect to obtain from a higher investor valuation.

At the same time, if voluntary reporting is a rhetorical legitimating tool for communicating with a broader range of politically and economically powerful stakeholders, a company with poorer social and environmental performance would have an incentive to continue with social and environmental sustainability reporting practices if possible. In contrast, if integrated reporting is just a developed form of existing self-legitimating sustainability reporting, and the company does not have an incentive to refine its voluntary reporting philosophy through its reporting, a company with poorer social and environmental performance will have an incentive to shift to integrated reporting practices as soon as possible.

The IIRC (2013, p.4) asserts that integrated reporting "… promotes a more cohesive and efficient approach to corporate reporting and aims to improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital".

[5] However, some integrated reports can be quite long.

[6] The volume of sustainability report contents often used in social and environmental sustainability reporting research has also been just one proxy to represent actual voluntary reporting practices, and the proxy Y does not always exactly match with actual voluntary reporting practices Y*. For example, we can only describe the relationship between the (visualized) proxy and actual practice as $Y = 1$ if $Y^* > 0$ and $Y = 0$ if $Y^* \leq 0$, other than $Y = Y^*$. Therefore, the selection of a proxy variable is context specific, and includes consideration of reporting quality and philosophy.

For companies agreeing with this suggestion—rather than considering integrated reporting to be just a developed form of existing (legitimizing) sustainability reporting—voluntary disclosure theory rather than legitimacy theory should be applicable to integrated reporting. Conversely, "… fundamental to [integrated reporting may be] that it seeks legitimacy in situations where neither the practice nor the (institutional) environment is fixed" (van Bommel, 2014, p.1159). Therefore, we propose the following hypotheses for testing[7]:

**H1a**. Companies with better social and environmental performance are more likely to shift to integrated reporting practices sooner.

H1a also suggests that companies with worse social and environmental performance are more likely to continue with social and environmental sustainability reporting practices longer.

**H1b**. Companies with worse social and environmental performance are more likely to shift to integrated reporting practices sooner.

## 4. Research design

### 4.1. Regression model

We employ *survival analysis* to assess these hypotheses because when companies adopt integrated reporting, they subsequently continue with the practice. Survival analysis focuses on the hazard rate, which is the probability of timing and duration for a company to shift to integrated reporting where social and environmental sustainability reporting has been its previous practice. This enables us to include time dimensions regarding the shift to (or initial adoption of) integrated reporting practices. In other words, because survival analysis analyses the time to event (the length of time before each company in the sample initially publishes an integrated report), we can clarify which companies are *early* adopters of integrated reporting. This contrasts with the ordinary least squares (OLS) and probit models often used in accounting research which focus on the continuation of reporting practices within annual and sustainability reports.

Suppose the random variable $T$ represents the duration interval *until* a company initiates integrated reporting, which has a continuous probability distribution $f(t)$, where $t$ is a realization of $T$. Then, the cumulative distribution function of the initiation of integrated reporting is as follows:

$$F(t) = Pr(T \leq t) = \int_0^t f(u)du$$

The survival function $S(t)$ is the probability that the duration interval (until a company initiates integrated reporting) is at least of length $t$.

$$S(t) = Pr(T > t) = 1 - F(t)$$

where $0 \leq S(t) \leq 1$, $S(0) = 1$, $lim_{t\to\infty} S(t) = S(\infty) = 0$, and the hazard function $h(t)$ is the ratio of the continuous probability distribution $f(t)$ and the survival function $S(t)$. This measures the probability of timing and duration for companies that have not yet adopted integrated reporting practices but that will initially adopt them in the following period $\left( = \lim_{\Delta t \to 0} \frac{Pr(t \leq T < t+\Delta t | t \leq T)}{\Delta t} \right)$.

$$h(t) = \frac{f(t)}{S(t)}$$

Within survival analysis, the proportional hazards model estimating the parameter(s) without requiring estimation of the baseline hazard is a popular regression method for analysing the effect of explanatory variables on the hazard rate (Cox, 1972; Greene, 2003).

$$h_{it} = h_0(t) exp(\beta_1 SEP_{it} + \beta_2 CONT_{it})$$

where $h$ is the hazard rate, $h_0(t)$ is the baseline hazard, *SEP* is a variable that captures social and environmental performance, *CONT* is a control variable, and $\beta$ are the estimated coefficients.

### 4.2. Sample selection

The data used for the regression analyses are pooled data for the 100-largest companies listed on each of the Tokyo Stock Exchange and London Stock Exchange (FTSE 100 and their equivalent Tokyo Stock Exchange companies) from 2012 (just after the IIRC introduced its basic principles for the integrated reporting framework) until 2017. The FTSE 100 companies is a common sample for London Stock Exchange listed companies, as is the analysis of the 100-largest companies on the Tokyo Stock Exchange. However, because the sampling is not random, there can be bias in regression estimations, a situation known as sample selection bias (Heckman, 1979). Because our sample consists only of the very largest companies, we cannot deny the potential for sample selection bias in our data and the possibility that our findings will not then be generalizable. To correct for the latent sample selection bias, we employ the Heckman inverse Mills ratio method as detailed later.

We exclude financial sector companies from the sample because they differ from other companies in other sectors in the form and content of their financial reporting. The total number of company-year observations across the six years 2012–2017 in our unbalanced panel of data is 426 for 82 Tokyo listed nonfinancial companies and 320 observations for 71 London listed nonfinancial companies.

### 4.3. Variable measurement

The dependent variable is the *hazard rate* for the period in years from 2012 until the date a company first publishes an integrated report that claims that it follows the IIRC's definition of integrated reporting. The independent variable used to capture a company's social and environmental performance is the social and environmental score. We alternatively specify the emission reduction score as a robustness check.

The control variables are company size as measured by the logarithm of net sales (in pounds sterling) (e.g., Al-Tuwaijri et al., 2004; Bewley and Li, 2000; Cho and Patten, 2007; Cho et al., 2012; Clarkson et al., 2008, 2011; Nishitani et al., 2020; Patten, 2000, 2002), profitability as measured by the return on assets (ROA) (e.g., Al-Tuwaijri et al., 2004; Bewley and Li, 2000; Cho et al., 2012; Clarkson et al., 2008, 2011; Nishitani et al., 2020), financial leverage as measured by the debt ratio (e.g., Cho et al., 2012; Clarkson et al., 2008, 2011; Nishitani et al., 2020), and industry-specific characteristics as measured by industry sector dummies (e.g., Bewley and Li, 2000; Cho et al., 2012; Clarkson et al., 2008, 2011; Nishitani et al., 2020; Patten, 1991, 2002). While these controls either match or exceed the minimum required control variables commonly employed in previous studies in the area, Guidry and Patten (2012) noted that including many control variables unnecessarily would not significantly change the results.

Table 1 lists the definitions of these dependent and independent variables, Table 2 provides their descriptive statistics, and Table 3 presents the correlation matrix for the variables. To assess the potential for harmful multicollinearity, we use the pairwise correlation coefficients between the independent variables, revealing the highest correlations to be 0.538 for the Tokyo listed companies and 0.542 for the London listed companies, both between the social and environmental score and company size. While the correlations between the social and environmental score and the emission reduction score are higher, 0.898 for the

[7] Given that we empirically evaluate these hypotheses using data for the largest companies listed on each of the Tokyo and London stock exchanges, we correct for the latent sample selection bias associated with sampling only the largest companies. Were this not the case, the hypotheses should commence with "Large companies with …" rather than "Companies with …".

**Table 1**
Variable definitions and sources.

| Definition | Database |
|---|---|
| **Hazard rate**: the hazard rate is the period in years from 2012 until the date a company first publishes an integrated report claiming to follow the IIRC's definitions of integrated reporting. Calculated using data on whether and when a company adopts integrated reporting (IR dummy), omitting companies that have initiated integrated reporting by the previous year from the sample in this and any subsequent year. | Hand-collected from the IIRC's website and each company's webpage |
| **Social and environmental score**: the average of the environmental and social scores in the ASSET4 database provided by Thomson Reuters. Social and environmental sustainability information in an integrated report and the sustainability report covers not only environmental but also social aspects. Thus, social and environmental performance should be simultaneously considered for the analyses. However, if included in the same regression (as proxies for social and environmental performance, respectively), they will cause a multicollinearity problem because they tend to be highly correlated. To avoid this problem, we employ the average of the social and environmental scores as a single variable. According to ASSET4's definitions, the environmental score measures a company's impact on living and non-living natural systems, including air, land, and water, as well as complete ecosystems. It thus reflects how well a company uses best management practices to reduce environmental risks and capitalize on environmental opportunities. In contrast, ASSET4's social score measures a company's capacity to generate trust and loyalty with its workforce, customers, and society, through its use of best management practices. According to ASSET4's definitions, this reflects the company's reputation and the health of its social licence to operate. Note that the estimation results do not change majorly even if we employ both the social and environmental scores.<br>**Emission reduction score:** the emission reduction score measures a company's management commitment and effectiveness towards reducing environmental emissions in its production and operational processes. It reflects a company's capacity to reduce air emissions (greenhouse gases, F-gases, ozone-depleting substances, NOx, and SOx, etc.), waste, hazardous waste, water discharges, spills or its impacts on biodiversity, and to form partnerships with environmental organizations to reduce the environmental impact of the company in the local or broader community. | Datastream database |
| **Company size**: the logarithm of net sales (in pounds sterling).<br>**Return on assets (ROA)**: net income divided by total assets.<br>**Debt ratio**: debt divided by equity.<br>**Industry sector dummies**: dummy variables that take a value of one if a company belongs to the mining, construction & real estate, manufacturing with larger environmental impacts, manufacturing with smaller environmental impacts, utility (electric power & gas), transportation, information & communication, or sales & service (wholesale, retail trades & service) sectors, respectively. Because industry-specific influences go beyond industry-specific social and environmental impacts, this series of industry sector dummies is preferable to dummy variables simply classified as environmentally sensitive or socially exposed industries. However, (at least) whether social and environmental impacts of companies in the manufacturing industry are larger or smaller depends on their sub-classification within this industry sector. For example, Patten (1991, 2002) categorizes chemical, metals, paper, and petroleum industries as industries with larger environmental impacts. Accordingly, we divide companies in the manufacturing sector in our sample into those in manufacturing with larger environmental impacts and those in manufacturing with smaller environmental impacts based on this categorization. | Bloomberg database |

Tokyo listed companies and 0.768 for the London listed companies, we do not include both variables in the same regression. We also calculate the variance inflation factors (VIFs) for both sets of companies (results not shown), with the highest VIFs being 2.03 and 2.11 for the Tokyo and London listed companies, respectively. Both the correlation analysis and the VIFs suggest we need not be too concerned about the potential for harmful multicollinearity.

## 5. Estimation results

Tables 4 and 5 provide the estimation results concerning the influence of social and environmental performance on the probability of timing and duration of a shift to integrated reporting practices (or hazard rate) for our sample of Tokyo and London listed companies. The regressions in Table 4 assume all companies are homogeneous, while Table 5 assumes that they are heterogeneous in terms of industry sector when capturing the influence of social and environmental performance.

Each table details the results for Models (1T), (2T), (1L), and (2L) and for Panels A and B. Models (1T) and (2T) and Models (1L) and (2L) provide the estimation results for Tokyo (T) and London (L) listed companies for the periods 2012–2014 and 2012–2017, respectively. We use these different periods to identify the dynamics of the motivations for companies shifting to integrated reporting or continuing with social and environmental sustainability reporting. Panels A and B provide estimation results with/without taking the latent sample selection bias into consideration, because our sampling is not random (i.e., the largest-100 companies). For this purpose, all models in Panel B additionally include the inverse Mills ratio as a correction term following Miller et al. (2008).

The inverse Mills ratio is from a probit regression estimating the likelihood on becoming a largest-100 company using all companies listed on the Tokyo and London stock exchanges without missing values over the 6 years of our sample period (2012–2017) (17,698 observations for 3210 Tokyo listed companies and 16,826 observations for 3531 London listed companies). In the probit regression, we use the capital intensity ratio (i.e., the book value of tangible fixed assets divided by the number of employees) as a variable potentially influencing the likelihood of becoming a largest-100 company but not directly influencing the adoption of integrated reporting in addition to the control variables. This is reasonable as the managerial finance literature is undecided about whether capital intensity influences a company's firm value positively or negatively (e.g., Bourke et al., 2020; Lee and Xiao, 2011; Pattanayak, 2009). Indeed, we find capital intensity is a significantly positive influence on becoming one of the 100-largest Tokyo listed companies, but a significantly negative influence for London listed companies (results not shown). However, it is unlikely that capital intensity directly influences a company's voluntary reporting philosophy at present. The following subsections present the overall and industry sector-level estimation results and the discussion.

### 5.1. Overall estimation

We first examine the estimation results in Table 4. All models include seven industry sector dummies to control for industry-specific influences, although we do not display their coefficients (the same applies to Tables 5–7).

Models (1T) and (2T) in Panels A and B show that the social and environmental score is significantly positive. Although the results in

**Table 2**
Descriptive statistics.

| Tokyo listed companies | Obs. | Mean | SD | Min | Max | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| IR dummy | 426 | 0.056 | 0.231 | 0 | 1 | 3.848 | 15.810 |
| Social and environmental score | 426 | 73.587 | 24.363 | 7.935 | 95.725 | −1.433 | 3.753 |
| Emission reduction score | 424 | 78.157 | 24.751 | 9.120 | 96.300 | −1.676 | 4.596 |
| Company size | 426 | 23.079 | 1.084 | 20.577 | 25.864 | 0.054 | 2.566 |
| ROA | 426 | 5.003 | 4.250 | −12.572 | 31.985 | 1.067 | 7.988 |
| Debt ratio | 426 | 64.890 | 79.928 | 0 | 455.559 | 2.204 | 8.625 |
| Industry dummy | | | | | | | |
| Mining | 426 | 0.014 | 0.118 | 0 | 1 | 8.247 | 69.014 |
| Construction & real estate | 426 | 0.052 | 0.222 | 0 | 1 | 4.052 | 17.418 |
| Manufacturing with larger environmental impacts | 426 | 0.092 | 0.289 | 0 | 1 | 2.833 | 9.024 |
| Manufacturing with smaller environmental impacts | 426 | 0.521 | 0.500 | 0 | 1 | −0.085 | 1.007 |
| Utility | 426 | 0.028 | 0.166 | 0 | 1 | 5.703 | 33.529 |
| Transportation | 426 | 0.056 | 0.231 | 0 | 1 | 3.848 | 15.810 |
| Information & communication | 426 | 0.087 | 0.282 | 0 | 1 | 2.934 | 9.609 |
| Sales & service | 426 | 0.150 | 0.358 | 0 | 1 | 1.958 | 4.833 |
| **London listed companies** | **Obs.** | **Mean** | **SD** | **Min** | **Max** | **Skewness** | **Kurtosis** |
| IR dummy | 320 | 0.069 | 0.253 | 0 | 1 | 3.409 | 12.619 |
| Social and environmental score | 320 | 78.216 | 17.066 | 9.415 | 95.590 | −1.764 | 5.924 |
| Emission reduction score | 319 | 79.801 | 18.201 | 15.960 | 96.250 | −1.835 | 5.958 |
| Company size | 320 | 22.322 | 1.573 | 18.446 | 26.460 | 0.196 | 3.070 |
| ROA | 320 | 10.920 | 26.562 | −18.899 | 235.464 | 6.987 | 55.548 |
| Debt ratio | 320 | 82.498 | 85.841 | 0 | 495.231 | 2.226 | 8.891 |
| Industry dummy | | | | | | | |
| Mining | 320 | 0.028 | 0.166 | 0 | 1 | 5.708 | 33.584 |
| Construction & real estate | 320 | 0.109 | 0.313 | 0 | 1 | 2.503 | 7.266 |
| Manufacturing with larger environmental impacts | 320 | 0.147 | 0.355 | 0 | 1 | 1.995 | 4.981 |
| Manufacturing with smaller environmental impacts | 320 | 0.234 | 0.424 | 0 | 1 | 1.254 | 2.573 |
| Utility | 320 | 0.072 | 0.259 | 0 | 1 | 3.315 | 11.990 |
| Transportation | 320 | 0.019 | 0.136 | 0 | 1 | 7.096 | 51.352 |
| Information & communication | 320 | 0.122 | 0.328 | 0 | 1 | 2.312 | 6.344 |
| Sales & service | 320 | 0.269 | 0.444 | 0 | 1 | 1.043 | 2.088 |

Panel B show that the estimate for the inverse Mills ratio is significantly negative, the results in Panels A and B do not differ, meaning that sample selection bias is not a significant problem when we assume all Tokyo listed companies are homogeneous. These results suggest that Tokyo listed companies with better social and environmental performance are more likely to have shifted to integrated reporting practices early and by 2014 at the latest, which supports Hypothesis 1a for Tokyo listed companies.

In contrast, Models (1L) and (2L) in Panels A and B show that the social and environmental score does not have a statistically significant influence on the shift to integrated reporting for London listed companies. As with the estimates for the Tokyo listed companies, the estimation results in Panels A and B do not differ, meaning that sample selection bias is also not a significant problem for London listed companies. These results suggest that London listed companies with better or worse social and environmental performance are not more likely to have shifted to integrated reporting practices by 2017, which fails to support either Hypothesis 1a or Hypothesis 1b for London listed companies in either period.

### 5.2. Industry sector-level estimation

We next examine the estimation results in Table 5. To analyse the influence of social and environmental performance on the timing and duration of a shift to integrated reporting practices in different industry sectors, the models additionally include the interaction terms between the social and environmental score and the eight industry sector dummies.

Model (1T) in Panels A and B shows that the interaction terms between the social and environmental score and an industry sector dummy are significantly positive for manufacturing with larger environmental impacts, manufacturing with smaller environmental impacts, and the information & communication sectors, and significantly negative for the mining sector. Model (2T) in Panel A shows that the interaction terms for the social and environmental score and the industry sector dummies are only significantly positive for the manufacturing with smaller environmental impacts sector. However, Model (2T) in Panel B shows that the interaction terms for the social and environmental score and industry sector dummy are additionally significantly negative for the mining and utility sectors. Although the estimation results for Model (1T) in Panels A and B do not differ, those for Model (2T) in Panels A and B differ, suggesting the underestimation of the (negative) influence of the social and environmental score is because of sample selection bias for Model (2T) in Panel A.

These results suggest that Tokyo listed companies with better social and environmental performance in the manufacturing with smaller environmental impacts sector, and those with worse social and environmental performance in the mining sector are more likely to have shifted to integrated reporting practices by 2014 at the latest, whereas those with worse social and environmental performance in the utility sector are more likely to have shifted to integrated reporting practices by 2017 at the latest. This supports Hypothesis 1a for Tokyo listed companies in the manufacturing with smaller environmental impacts sector, and Hypothesis 1b for those in the mining and utility sectors. However, while Tokyo listed companies with better social and environmental performance in the manufacturing with larger environmental impacts and information & communication sectors are more likely to have shifted to integrated reporting practices by 2014 at the latest, these findings are not robust over the longer period (by 2017).

Model (1L) in Panel A shows that the interaction term between the social and environmental score and the industry sector dummy is significantly positive for the manufacturing with larger environmental impacts, manufacturing with smaller environmental impacts, and the sales & service sectors, and significantly negative for the transportation sector for London listed companies. However, Model (1L) in Panel B shows that the interaction term between the social and environmental score and the industry sector dummy is not significant for companies in the transportation sector, implying the overestimation of the (negative)

**Table 3**
Correlation matrix.

| Tokyo listed companies | | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] | [11] | [12] | [13] | [14] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [1] | IR dummy | 1.000 | | | | | | | | | | | | | |
| [2] | Social and environmental score | 0.109 | 1.000 | | | | | | | | | | | | |
| [3] | Emission reduction score | 0.125 | 0.898 | 1.000 | | | | | | | | | | | |
| [4] | Company size | 0.088 | 0.538 | 0.519 | 1.000 | | | | | | | | | | |
| [5] | ROA | −0.067 | −0.397 | −0.364 | −0.529 | 1.000 | | | | | | | | | |
| [6] | Debt ratio | −0.020 | −0.042 | −0.073 | 0.341 | −0.453 | 1.000 | | | | | | | | |
| [7] | Mining | −0.029 | 0.017 | 0.082 | −0.037 | −0.025 | −0.070 | 1.000 | | | | | | | |
| [8] | Construction & real estate | −0.011 | −0.123 | −0.141 | −0.047 | −0.171 | 0.361 | −0.028 | 1.000 | | | | | | |
| [9] | Manufacturing with larger environmental impacts | 0.028 | 0.135 | 0.101 | −0.079 | 0.057 | −0.162 | −0.038 | −0.074 | 1.000 | | | | | |
| [10] | Manufacturing with smaller environmental impacts | −0.031 | 0.144 | 0.167 | −0.033 | 0.068 | −0.315 | −0.125 | −0.243 | −0.331 | 1.000 | | | | |
| [11] | Utility | −0.042 | 0.026 | 0.008 | 0.066 | −0.129 | 0.268 | −0.020 | −0.040 | −0.054 | −0.178 | 1.000 | | | |
| [12] | Transportation | −0.060 | −0.092 | 0.023 | 0.019 | −0.139 | 0.247 | −0.029 | −0.057 | −0.078 | −0.255 | −0.042 | 1.000 | | |
| [13] | Information & communication | −0.003 | −0.117 | −0.190 | 0.035 | 0.146 | −0.004 | −0.037 | −0.072 | −0.098 | −0.322 | −0.053 | −0.075 | 1.000 | |
| [14] | Sales & service | 0.097 | −0.100 | −0.124 | 0.082 | 0.007 | 0.090 | −0.050 | −0.098 | −0.134 | −0.439 | −0.072 | −0.103 | −0.130 | 1.000 |
| London listed companies | | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] | [11] | [12] | [13] | [14] |
| [1] | IR dummy | 1.000 | | | | | | | | | | | | | |
| [2] | Social and environmental score | 0.072 | 1.000 | | | | | | | | | | | | |
| [3] | Emission reduction score | 0.065 | 0.768 | 1.000 | | | | | | | | | | | |
| [4] | Company size | 0.127 | 0.542 | 0.468 | 1.000 | | | | | | | | | | |
| [5] | ROA | −0.018 | −0.313 | −0.384 | −0.354 | 1.000 | | | | | | | | | |
| [6] | Debt ratio | −0.064 | 0.162 | 0.018 | 0.103 | −0.139 | 1.000 | | | | | | | | |
| [7] | Mining | 0.327 | 0.019 | 0.051 | 0.032 | 0.005 | −0.115 | 1.000 | | | | | | | |
| [8] | Construction & real estate | −0.056 | −0.003 | 0.060 | −0.308 | −0.040 | −0.249 | −0.060 | 1.000 | | | | | | |
| [9] | Manufacturing with larger environmental impacts | −0.043 | 0.203 | 0.196 | 0.320 | −0.086 | −0.069 | −0.071 | −0.145 | 1.000 | | | | | |
| [10] | Manufacturing with smaller environmental impacts | −0.005 | 0.047 | 0.010 | −0.049 | −0.034 | −0.043 | −0.094 | −0.194 | −0.230 | 1.000 | | | | |
| [11] | Utility | −0.028 | 0.075 | −0.029 | 0.125 | −0.051 | 0.310 | −0.047 | −0.098 | −0.116 | −0.154 | 1.000 | | | |
| [12] | Transportation | −0.038 | −0.147 | 0.063 | −0.013 | −0.013 | −0.069 | −0.024 | −0.048 | −0.057 | −0.077 | −0.039 | 1.000 | | |
| [13] | Information & communication | 0.050 | −0.134 | −0.187 | −0.187 | −0.041 | −0.030 | −0.063 | −0.131 | −0.155 | −0.206 | −0.104 | −0.052 | 1.000 | |
| [14] | Sales & service | −0.053 | −0.112 | −0.093 | 0.065 | 0.191 | 0.177 | −0.103 | −0.212 | −0.252 | −0.335 | −0.169 | −0.084 | −0.226 | 1.000 |

**Table 4**
Influence of social and environmental performance on hazard rate for integrated reporting.

| | (1T) | | (2T) | | (1L) | | (2L) | |
|---|---|---|---|---|---|---|---|---|
| | 2012–2014 | | 2012–2017 | | 2012–2014 | | 2012–2017 | |
| Panel A | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. |
| Social and environmental score | 0.070 | 0.022*** | 0.033 | 0.017* | 0.047 | 0.029 | 0.019 | 0.023 |
| Company size | −0.351 | 0.273 | 0.017 | 0.236 | 0.194 | 0.183 | 0.289 | 0.158* |
| ROA | −0.023 | 0.089 | −0.054 | 0.048 | 0.012 | 0.013 | 0.003 | 0.008 |
| Debt ratio | 0.0002 | 0.003 | −0.003 | 0.003 | −0.002 | 0.004 | −0.002 | 0.003 |
| Industry sector dummies | yes | | yes | | yes | | yes | |
| Wald test (p-value) | 0.000 | | 0.003 | | 0.000 | | 0.000 | |
| Log pseudolikelihood | −42.898 | | −94.323 | | −64.422 | | −81.030 | |
| Observations | 232 | | 426 | | 176 | | 320 | |
| | (1T) | | (2T) | | (1L) | | (2L) | |
| | 2012–2014 | | 2012–2017 | | 2012–2014 | | 2012–2017 | |
| Panel B | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. |
| Social and environmental score | 0.081 | 0.025*** | 0.033 | 0.019* | 0.040 | 0.027 | 0.026 | 0.023 |
| Company size | −2.173 | 0.867** | −0.873 | 0.553 | −0.048 | 0.419 | 0.528 | 0.441 |
| ROA | −0.088 | 0.102 | −0.086 | 0.052* | -0.0001 | 0.016 | 0.011 | 0.017 |
| Debt ratio | 0.005 | 0.004 | −0.002 | 0.004 | −0.002 | 0.005 | −0.002 | 0.003 |
| Inverse Mills ratio | −2.947 | 1.535* | −1.615 | 0.950* | −1.284 | 1.915 | 1.223 | 1.729 |
| Industry sector dummies | yes | | yes | | yes | | yes | |
| Wald test (p-value) | 0.000 | | 0.002 | | 0.000 | | 0.000 | |
| Log pseudolikelihood | −41.642 | | −92.669 | | −64.257 | | −74.952 | |
| Observations | 228 | | 417 | | 169 | | 304 | |

***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

influence of the social and environmental score due to sample selection bias for Model (1L) in Panel A. Conversely, Model (2L) in Panels A and B indicates that the interaction term between the social and environmental score and the industry sector dummy is significantly positive for the manufacturing with smaller environmental impacts sector.

These results suggest that London listed companies with better social and environmental performance in manufacturing with smaller environmental impacts are more likely to have shifted to integrated reporting practices by 2014 at the latest, which supports Hypothesis 1a for London listed companies in the manufacturing with smaller environmental impacts sector. Alternatively, while London listed companies with better social and environmental performance in manufacturing with larger environmental impacts and the sales & service sectors are more likely to have shifted to integrated reporting practices by 2014 at the latest, these findings are not robust over the longer period (by 2017).

### 5.3. Robustness check

In addition to the social and environmental score, we also specify ASSET4's emission reduction score as a proxy for each company's social and environmental performance for a robustness check. This proxy captures the characteristics of specific social and environmental performance. Tables 6 and 7 provide the estimation results for the overall and industry sector-level estimation, respectively (Panel B only).

As shown in Table 6, while Models (1T) and (2T) show that the emission reduction score is significantly positive, Models (1L) and (2L) do not. Thus, the estimation results for both the Tokyo and London listed companies are like those in Table 4, which robustly supports Hypothesis 1a for Tokyo listed companies.

In Table 7, the estimates for Models (1T) and/or (2T) show that the interaction term between the emission reduction score and the industry sector dummy is significantly positive in the manufacturing with smaller environmental impacts, information & communication, and sales & service sectors, and significantly negative in the mining sector. In addition, Models (1L) and/or (2L) show that the interaction terms between the emission reduction score and the industry sector dummy are significantly positive in the mining, utility, and sales & service sectors, and significantly negative in the information & communication sector. However, this negative influence for the information & communication sector weakens over time (by 2017).

Thus, while there is some similarity between these results and those in Table 5, they differ in terms of demonstrating the positive influence of the emission reduction score over the social and environmental score in more industry sectors. Indeed, Models (1T) and (2T) support Hypothesis 1a for Tokyo listed companies in the construction & real estate, information & communication, and sales & service sectors as well as the manufacturing with smaller environmental impacts sector. Furthermore, Models (1L) and (2L) also support Hypothesis 1a for London listed companies in the mining, utility, and sales & service sectors, but not those in the manufacturing with smaller environmental impacts sector.

These results imply that Hypothesis 1a is sufficiently robust, and even stronger when social and environmental performance is proxied by more specific environmentally oriented variables. This is consistent with previous findings in the literature. However, Hypothesis 1b is not very robust because Model (2T) supports Hypothesis 1b only for Tokyo listed companies in the mining sector (before 2017).

## 6. Discussion

An increasing number of providers of financial capital are recognizing long-term financial risks and impacts arising from corporate social and environmental policies, practices, and outcomes. This has led to recognition of the need to integrate relevant social and environmental sustainability information with the financial reporting in corporate reports targeted at investors. Policymakers have responded to this need by developing integrated reporting, with the IIRC leading development of an integrated reporting framework. Motivations for managers to shift or additionally adopt this new form of voluntary corporate reporting, combining elements of existing forms of voluntary social and environmental sustainability reporting with a much narrower focus on reporting to investors, could vary from the legitimation motivations that the academic literature has found to underlie broader social and environmental sustainability reporting. In this context, the aim of this study was to ascertain the apparent primary motivation for corporations to shift to integrated reporting or to continue with social and environmental sustainability reporting. To address these aims, we hand collected data and

**Table 5**
Influence of social and environmental performance on hazard rate of integrated reporting at the industry sector level.

| | (1T) | | (2T) | | (1L) | | (2L) | |
|---|---|---|---|---|---|---|---|---|
| | 2012–2014 | | 2012–2017 | | 2012–2014 | | 2012–2017 | |
| Panel A | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. |
| Social and environmental score | | | | | | | | |
| ×Mining | −0.063 | 0.033* | −0.012 | 0.034 | −0.080 | 0.057 | −0.044 | 0.038 |
| ×Construction & real estate | 0.004 | 0.021 | 0.001 | 0.024 | −0.066 | 0.071 | −0.027 | 0.030 |
| ×Manufacturing with larger environmental impacts | 0.545 | 0.229** | 0.020 | 0.024 | 0.643 | 0.200*** | 0.238 | 0.172 |
| ×Manufacturing with smaller environmental impacts | 0.070 | 0.025*** | 0.065 | 0.026** | 0.145 | 0.054*** | 0.145 | 0.056*** |
| ×Utility | −0.007 | 0.102 | −0.033 | 0.096 | −0.047 | 0.048 | −0.043 | 0.044 |
| ×Transportation | 0.002 | 0.021 | −0.001 | 0.021 | −0.179 | 0.096* | −0.048 | 0.094 |
| ×Information & communication | 0.043 | 0.018** | 0.040 | 0.025 | −0.009 | 0.022 | −0.005 | 0.022 |
| ×Sales & service | 0.071 | 0.047 | 0.025 | 0.025 | 0.524 | 0.169*** | 0.011 | 0.039 |
| Company size | −0.284 | 0.254 | 0.019 | 0.231 | 0.452 | 0.207** | 0.382 | 0.131*** |
| ROA | −0.002 | 0.080 | −0.059 | 0.049 | 0.005 | 0.018 | 0.002 | 0.009 |
| Debt ratio | 0.0001 | 0.003 | −0.004 | 0.003 | −0.003 | 0.005 | −0.003 | 0.004 |
| Industry sector dummies | yes | | yes | | yes | | yes | |
| Wald test (p-value) | 0.000 | | 0.000 | | 0.000 | | 0.000 | |
| Log pseudolikelihood | −42.241 | | −93.742 | | −58.760 | | −78.449 | |
| Observations | 232 | | 426 | | 176 | | 320 | |

| | (1T) | | (2T) | | (1L) | | (2L) | |
|---|---|---|---|---|---|---|---|---|
| | 2012–2014 | | 2012–2017 | | 2012–2014 | | 2012–2017 | |
| Panel B | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. |
| Social and environmental score | | | | | | | | |
| ×Mining | −0.101 | 0.034*** | −0.081 | 0.031*** | −0.072 | 0.056 | −0.044 | 0.042 |
| ×Construction & real estate | 0.002 | 0.023 | −0.002 | 0.026 | 0.005 | 0.066 | 0.008 | 0.217 |
| ×Manufacturing with larger environmental impacts | 0.569 | 0.235** | 0.002 | 0.033 | 0.485 | 0.125*** | 0.265 | 0.192 |
| ×Manufacturing with smaller environmental impacts | 0.072 | 0.025*** | 0.062 | 0.024*** | 0.144 | 0.063** | 0.151 | 0.053*** |
| ×Utility | 0.025 | 0.032 | −0.096 | 0.033*** | −0.089 | 0.058 | −0.025 | 0.052 |
| ×Transportation | 0.003 | 0.021 | −0.031 | 0.039 | −0.002 | 0.151 | −0.028 | 0.328 |
| × Information & communication | 0.085 | 0.033*** | 0.073 | 0.047 | −0.024 | 0.023 | 0.001 | 0.022 |
| ×Sales & service | 0.077 | 0.057 | 0.019 | 0.027 | 0.531 | 0.176*** | 0.015 | 0.037 |
| Company size | −2.314 | 0.892*** | −0.963 | 0.536* | −0.029 | 0.408 | 0.568 | 0.387 |
| ROA | −0.071 | 0.097 | −0.088 | 0.052* | −0.019 | 0.024 | 0.009 | 0.020 |
| Debt ratio | 0.006 | 0.004 | −0.001 | 0.004 | −0.004 | 0.006 | −0.003 | 0.004 |
| Inverse Mills ratio | −3.336 | 1.577** | −1.793 | 0.991* | −2.561 | 2.020 | 0.986 | 1.785 |
| Industry sector dummies | yes | | yes | | yes | | yes | |
| Wald test (p-value) | 0.000 | | 0.000 | | 0.000 | | 0.000 | |
| Log pseudolikelihood | −40.877 | | −91.853 | | −58.328 | | −72.557 | |
| Observations | 228 | | 417 | | 169 | | 304 | |

***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

**Table 6**
Robustness check for the influence of social and environmental performance on the hazard rate for integrated reporting.

| | (1T) | | (2T) | | (1L) | | (2L) | |
|---|---|---|---|---|---|---|---|---|
| | 2012–2014 | | 2012–2017 | | 2012–2014 | | 2012–2017 | |
| Panel B | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. |
| Emission reduction score | 0.082 | 0.034** | 0.073 | 0.025*** | 0.009 | 0.022 | 0.020 | 0.024 |
| Company size | −1.471 | 0.820* | −0.775 | 0.549 | 0.002 | 0.396 | 0.585 | 0.424 |
| ROA | −0.089 | 0.095 | −0.070 | 0.057 | −0.008 | 0.019 | 0.013 | 0.020 |
| Debt ratio | 0.004 | 0.004 | 0.001 | 0.004 | −0.002 | 0.005 | −0.001 | 0.003 |
| Inverse Mills ratio | −1.694 | 1.524 | −1.177 | 1.039 | −1.819 | 1.899 | 1.152 | 1.846 |
| Industry sector dummies | yes | | yes | | yes | | yes | |
| Wald test (p-value) | 0.010 | | 0.000 | | 0.000 | | 0.000 | |
| Log pseudolikelihood | −41.924 | | −90.330 | | −64.990 | | −74.983 | |
| Observations | 232 | | 419 | | 170 | | 306 | |

***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

undertook a survival analysis of the probability of timing and the duration of a shift to integrated reporting by companies listed on the world's two largest stock exchanges outside the US, namely, Tokyo and London.

In the overall estimation, the data demonstrate a general trend towards accountability motivations consistent with voluntary disclosure theory for Tokyo listed companies, which supports Hypothesis 1a, but that there is no support for either Hypothesis 1a or Hypothesis 1b for London listed companies. The robustness check results also indicate the same trend. Therefore, Tokyo listed companies appear to regard integrated reporting as a tool for transparency and accountability to enhance shareholder value by providing information to aid improved decision-making by their investors, consistent with the IIRC's stated aims for integrated reporting. At the same time, they regard social and environmental sustainability reporting as a rhetorical legitimating tool for a broader range of politically and economically powerful

**Table 7**
Robustness check for the influence of social and environmental performance on the hazard rate for integrated reporting at the industry sector level.

| | (1T) | | (2T) | | (1L) | | (2L) | |
|---|---|---|---|---|---|---|---|---|
| | 2012–2014 | | 2012–2017 | | 2012–2014 | | 2012–2017 | |
| Panel B | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. | Coefficient | Robust S.E. |
| Emission reduction score | | | | | | | | |
| ×Mining | 0.020 | 0.154 | −0.139 | 0.034*** | 0.029 | 0.031 | 0.050 | 0.024** |
| ×Construction & real estate | 0.014 | 0.018 | 0.110 | 0.052** | 0.006 | 0.073 | −0.021 | 0.087 |
| ×Manufacturing with larger environmental impacts | −0.017 | 0.041 | −0.008 | 0.031 | −0.032 | 0.054 | 0.057 | 0.076 |
| ×Manufacturing with smaller environmental impacts | 0.352 | 0.208* | 0.121 | 0.057** | 0.017 | 0.042 | 0.019 | 0.047 |
| ×Utility | 0.067 | 0.085 | −0.039 | 0.040 | 5.016 | 4.656 | 0.543 | 0.252** |
| ×Transportation | −0.005 | 0.034 | −0.028 | 0.040 | 0.016 | 0.079 | 0.020 | 0.079 |
| ×Information & communication | 0.273 | 0.165* | 0.126 | 0.066* | −0.050 | 0.026* | −0.028 | 0.026 |
| ×Sales & service | 0.019 | 0.028 | 0.064 | 0.033* | 0.269 | 0.147* | 0.213 | 0.087** |
| Company size | −2.314 | 1.137** | −1.054 | 0.600* | −0.119 | 0.456 | 0.675 | 0.540 |
| ROA | −0.180 | 0.121 | −0.093 | 0.061 | 0.016 | 0.027 | 0.026 | 0.028 |
| Debt ratio | 0.006 | 0.005 | 0.001 | 0.004 | −0.001 | 0.005 | -0.0005 | 0.004 |
| Inverse Mills ratio | −2.959 | 2.007 | −1.664 | 1.162 | −3.143 | 2.127 | 1.038 | 2.305 |
| Industry sector dummies | yes | | yes | | yes | | yes | |
| Wald test (p-value) | 0.000 | | 0.000 | | 0.000 | | 0.000 | |
| Log pseudolikelihood | −40.198 | | −89.405 | | −60.852 | | −71.826 | |
| Observations | 232 | | 419 | | 170 | | 306 | |

***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

stakeholders. These findings suggest that Tokyo listed companies can refine their voluntary reporting philosophy using their reporting practices.

Earlier sustainability reporting studies indicate that it is possible that Japanese companies may intrinsically have a predisposition toward transparency and accountability as anticipated by voluntary disclosure theory (e.g., Kokubu et al., 2012). Kokubu et al. (2012) analysed the factors underlying the diffusion of sustainability reporting from the perspective of stakeholder theory and revealed the influence of investors on sustainability reporting practices in Japanese companies.[8] By comparing their results with those of previous studies on Japanese companies, Kokubu et al. (2012) suggested the possibility that the influential stakeholders for sustainability reporting practices in Japanese companies had shifted from final consumers to investors. This implied that environmental information had become important in the same way as financial information for investment decisions.[9]

Because nearly all Japanese listed companies have implemented sustainability reporting practices using stand-alone sustainability reports (whose role is to meet the information needs of a wide range of stakeholders), sustainability reporting has a limitation in displaying a company's future actions and plans specifically for economic value creation to providers of financial capital. Therefore, it is possible that Japanese companies with financial accountability motivations consider that integrated reporting is more appropriate than social and environmental sustainability reporting for this purpose. Because social and environmental sustainability reporting in annual reports has never been common in Japanese companies, such a tendency may be particularly stronger.

In contrast, there is no consensus in the analysis of our sample of London listed companies concerning the accountability or legitimacy motivation and expected role for integrated reporting. However, the proportion of the largest London listed companies that have adopted integrated reporting practices during the period covered by this study is higher than the proportion of the Tokyo listed companies that did so. Although data for some of our sample of London listed companies are consistent with an accountability motivation to shift to integrated reporting, the statistical influence of these companies in our overall sample may then cancel out through the opposing influence. Accordingly, because the robustness check supports an accountability motivation in many but not all industries, it is possible that some London listed companies display an accountability motivation in their shift to integrated reporting.

In the industry sector-level estimation, the data demonstrate a trend towards accountability motivations consistent with voluntary disclosure theory for Tokyo and London listed companies in the manufacturing with smaller environmental impacts sector, and a trend towards legitimating motivations consistent with legitimacy theory for Tokyo listed companies in the mining and utility sectors. In addition, the data also demonstrate a trend towards accountability motivations for Tokyo and London listed companies in other sectors. However, because these trends for companies in other sectors weaken over time, their motivations are not robust over the long term (from 2012 to 2017). That is, as time passes, the motivations to shift to integrated reporting or to continue with social and environmental sustainability reporting based on the underlying corporate reporting philosophy of financial accountability and/or rhetorical legitimation will become fixed.

Because the manufacturing with smaller environmental impacts sector is, if anything, among the potentially less environmentally harmful industries, and the mining and utility sectors are generally regarded as potentially more environmentally harmful industries, these estimation results support Hypothesis 1a for Tokyo and London listed companies in potentially less environmentally harmful industries, and Hypothesis 1b for Tokyo listed companies in potentially more environmentally harmful industries. Thus, the influence of social and environmental performance on the probability of the timing and duration of a shift to integrated reporting practices appears to differ between industries among Tokyo and London listed companies.

On the one hand, Tokyo and London listed companies in potentially less environmentally harmful industries appear motivated to shift to integrated reporting as a transparency and accountability tool to enhance shareholder value by providing reliable information to aid improved decision-making by their investors. At the same time, they

[8] In contrast, Liesen et al. (2015) analysed the factors affecting the diffusion of GHG emission reporting in European companies from the perspective of stakeholder theory and found no evidence that investors influenced GHG emissions disclosure.

[9] Given this, assurance practices to enhance the credibility of social and environmental information is another topic to be clarified (e.g., Ackers and Eccles, 2015; Haider and Kokubu, 2015). However, because the (third-party) assurance of social and environmental reporting currently provides assurance of only *partially* reported data and claims, we cannot really say that the quality of the social and environmental reporting with assurance is higher. Indeed, Nishitani et al. (2020) found that the stock market did not always positively evaluate such assured reporting.

appear motivated to continue with social and environmental sustainability reporting as a rhetorical legitimating tool for a broader range of politically and economically powerful stakeholders. These companies may then find it less challenging to incorporate social and environmental factors into their strategies because they have a relatively long history of implementing comprehensive sustainability management (Nishitani, 2011). Therefore, it is possible that those in potentially less environmentally harmful industries have a strong propensity for the rapid convergence of new voluntary reporting practices encompassing elements of social and environmental sustainability reporting.

However, according to the robustness check, while the trend in the accountability motivations of companies in potentially less environmentally harmful industries strengthens for Tokyo listed companies (i.e., manufacturing with smaller environmental impacts, information & communication, and sales & service sectors), it seems likely that accountability motivations are not exclusively confined to companies in potentially less environmentally harmful industries in the case of London listed companies (i.e., the mining, utilities, and sales & service sectors). In any case, there is a trend towards an accountability motivation in the shift to integrated reporting consistent with voluntary disclosure theory, even for London listed companies at the industry sector level.

On the other hand, Tokyo listed companies in potentially more environmentally harmful industries appear motivated to adopt integrated reporting more as a legitimizing tool. Therefore, the IIRC's proposed role for integrated reporting to be an accountability tool has not penetrated far among these companies. In other words, these companies regard integrated reporting as merely a developed form of existing self-legitimating sustainability reporting, and therefore do not have a strong incentive to differentiate their voluntary reporting philosophy using different forms of reporting. However, because Tokyo listed companies overall appear to regard integrated reporting as a transparency and accountability tool, the trend in legitimizing motivation may be limited to only a few companies. The results of the robustness check showing that only Tokyo listed companies in the mining sector have these legitimacy motivations also supports this view.

Together, these findings indicate that there are different motivations underlying voluntary reporting practices both between the two countries and between industry sectors. Overall, the main sustainability-related financial transparency and accountability role of integrated reporting proposed by the IIRC has gained some traction among Tokyo listed companies but not among London listed companies. However, there is a pronounced trend towards accountability motivations in the shift to integrated reporting consistent with voluntary disclosure theory, even for London listed companies at the industry sector level.

We find we can reveal previously hidden accountability motivations by focusing on a company's voluntary reporting philosophy and practices. As a considerable amount of extant sustainability reporting research has found legitimating motivations (Cho et al., 2015), the trends demonstrated in this study appear to provide a clear distinction between the (main) role of integrated reporting (accountability) and that of sustainability reporting (legitimation), with only minor exceptions. Accordingly, voluntary disclosure theory and legitimacy theory explanations for the motivations governing corporate voluntary reporting do not conflict with each other, at least for Tokyo listed companies overall and Tokyo and London listed companies at the industry sector level, especially potentially less environmentally harmful industries. Lai et al. (2016) support this in likewise concluding that companies were not adopting integrated reporting as a legitimation strategy. This cautions against academic research regarding integrated reporting as just another form of sustainability reporting, reinforcing a point made by Humphrey et al. (2017).

## 7. Conclusion

Through the analysis of Japanese and UK integrated reporting and social and environmental sustainability reporting practices from the perspective of both voluntary disclosure and legitimacy theory, we provide novel empirical insights into factors motivating the shift to voluntary integrated reporting. That is, companies refine or uncover their hitherto (hidden) voluntary reporting philosophy by adapting their reporting practices, and there are trends towards accountability motivations in shifts to integrated reporting consistent with voluntary disclosure theory. Because the number of studies identifying accountability motivations, at least from the relationship between specific environmental performance and reporting, has recently been increasing, as shown in Section 3.2, our findings may be generalizable to other companies given the growth of integrated reporting.

Our findings have an important theoretical implication. The conflict between legitimacy theory and voluntary disclosure theory derives from a common belief that company stakeholder- and shareholder-oriented approaches lie in opposition. However, such conventional beliefs do not match with the current situation surrounding corporate voluntary reporting practices, thereby creating a knowledge or research gap. In this situation, as Clarkson et al. (2008) and Hummel and Schlick (2016) also suggested this possibility, our findings provide support that legitimacy theory and voluntary disclosure theory are compatible, which only becomes evident after focusing on a company's voluntary reporting philosophy and practices. Accordingly, we challenge commonly accepted beliefs and arguments in previous studies regarding the role of corporate voluntary reporting. In this sense, we provide new academic implications for future research. The point is that when analysing the role of corporate voluntary reporting, it is necessary to again appreciate that sustainability, even at the company level, consists of social, environmental, and economic sustainability.

Our findings also have a practical implication for management. The IIRC (for integrated reporting) already co-operates with other organizations that provide corporate reporting standards to ensure consistency among reporting frameworks and standards, including the GRI (for social and environmental sustainability reporting). However, despite this co-operation, a clear segregation of the roles of integrated reporting and social environmental sustainability reporting is necessary. This is because, according to our findings, companies currently actually value either the IIRC's vision for integrated reporting (especially the narrow focus on investors) or the GRI standards, depending on their reporting philosophy. In contrast, some researchers expect integrated reporting to be a future direction for sustainability reporting (Alawattage and Fernando, 2017). As previously suggested, there is a movement to replace sustainability reporting with integrated reporting. This suggests the possibility that integrated reporting could become the reporting norm over time as more companies adopt integrated reporting practices (Stubbs and Higgins, 2018). When integrated reporting becomes more ubiquitous, it may be subject to greater capture from companies seeking to use it as a new medium for legitimation. However, if the results in this study apply more broadly, then such developments in integrated reporting could challenge any legitimacy role for sustainability reporting because integrated reporting is based on the concept of "value for investors" (Flower, 2015).

In common with other quantitative studies, a limitation of this study is how well we have selected the variables as proxies for the underlying phenomena we evaluate. Although we are studying a new voluntary reporting practice, as we have used variables that are well-established proxies in studies of other areas of voluntary reporting, this is not a major limitation. However, a more in-depth study of the content and quality of integrated reports could add further insights into the motivations for individual companies initiating their integrated reporting practices.

Regrettably, it would not be possible to undertake such an analysis across the sheer number of companies covered here within the scope of a single paper. Therefore, we believe that despite these limitations, our methods are best suited to addressing this study's specific research questions. Future case study research through, for example, interviews

and ethnographies, could provide more in-depth evidence of the motivations for integrated reporting or a continuation of social and environmental sustainability reporting. In addition, our methods of analysis could also apply in future empirical studies to other countries where integrated reporting is also gaining traction.

## CRediT authorship contribution statement

**Kimitaka Nishitani:** Conceptualization, Formal analysis, Writing – original draft, Funding acquisition. **Jeffrey Unerman:** Writing – original draft. **Katsuhiko Kokubu:** Writing – review & editing, Funding acquisition.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgments

We would like to dedicate this paper to the memory of Professor Jeffrey Unerman, who passed away during the final stages of manuscript preparation. This paper forms part of the results of research supported by Grant-in-Aid for Scientific Research (B) 19H01549 from the Japan Society for the Promotion of Science, and the Environment Research and Technology Development Fund (JPMEERF16S11606) from the Environmental Restoration and Conservation Agency, Japan.

## Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jclepro.2021.129027.

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