

Effects of social, environmental, and institutional factors on sustainability report assurance: evidence from European countries

Sustainability
report
assurance

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Lorenzo Simoni

Department of Economics, University of Genoa, Genoa, Italy, and

Laura Bini and Marco Bellucci

Department of Economics and Management, University of Florence, Florence, Italy

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Abstract

Purpose – The purpose of this study is to extend existing knowledge on the determinants of sustainability report (SR) assurance practices. Four different theories – stakeholder theory, institutional theory, signaling theory and legitimacy theory – are used to formulate several hypotheses regarding the main factors that can influence a company's decision to assure its SRs.

Design/methodology/approach – Using a sample of 417 listed organizations based in different European countries over five years, the effects of stakeholder commitment, country orientation toward sustainability, firm environmental performance and business ethics controversies on the decision to assure SRs are assessed.

Findings – The results show that a company's decision to assure its SRs is motivated by the need to maintain good relations with its stakeholders (which is in line with stakeholder theory and legitimacy theory), as well as by the willingness to signal their sustainability performance (which is in line with signaling theory) and to gain legitimacy. On the contrary, business ethics controversies do not seem to be relevant to a company's assurance practices.

Originality/value – This paper provides new insights into the influence that social, environmental and institutional factors have on assurance strategies. New factors that previous research does not investigate – environmental performance, business ethics controversies and corporate governance – are tested. Factors that are already investigated in the literature are considered from an original perspective of introducing alternative measures (e.g. for the scope of national sustainability policies).

Keywords Sustainability reporting, Assurance, CSR, Determinants

Paper type Research paper

1. Introduction

In the past two decades, companies have been paying growing attention to environmental and social issues, and there has been substantial growth in research devoted to social and environmental accounting topics (Deegan *et al.*, 2002; Kolk, 2008; Laine, 2010; McElroy and Baue, 2013; Siew, 2015; Domingues *et al.*, 2017). The disclosure of non-financial information is part of



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the dialogue between a company and its stakeholders, often providing evidence that can influence the perceptions of the latter (Adams and McNicholas, 2007; Michelon and Parbonetti, 2012). Previous research shows the value of sustainability disclosure (De Klerk and De Villiers, 2012; Cahan *et al.*, 2016; Fornaciari and Pesci, 2018). Sustainability reporting, in particular, enables organizations to evaluate how they contribute or expect to contribute, to the improvement or deterioration of economic, environmental and social conditions at the local, regional and global levels (GRI, 2013b, 2013c, 2016). A sustainability report (SR) should represent a complete and transparent statement about the extent to which the organization contributes to the sustainability of the planet (Gray, 2010). In other words, an SR requires a detailed and complex analysis of the interactions of organizations with ecological systems, resources, habitats and societies (Gray and Milne, 2002).

The most prevalent sustainability reporting framework is provided by the global reporting initiative (GRI) (Cohen and Simnett, 2014). The GRI's guidelines are the most trusted standards for sustainability reporting, as more than 12,000 organizations from more than 70 countries use or have used the GRI guidelines to produce their SRs (GRI, 2013b). These guidelines have continued to be refined and the most recent iteration was released in 2016.

While the mission statement of the GRI does not specifically address a mandatory need for independent assurance of SRs, it does encourage the development and adoption of principles for verification, as this can enhance underlying management systems and processes as well as the quality, usefulness and credibility of the information included in the report itself (Zorio *et al.*, 2013; Cohen and Simnett, 2014; Braam *et al.*, 2016). The popularity of sustainability reporting and the increased production of SRs have been accompanied by mounting interest in the accuracy of these reports (O'Dwyer *et al.*, 2005; Kolk and Perego, 2010; Brown-Liburd and Zamora, 2014; Briem and Wald, 2018). Stakeholders are demanding more transparency and companies are under increasing competitive and regulatory pressure to demonstrate a commitment to corporate social responsibility (Corporate Register, 2008).

The benefits associated to the assurance of SRs has been emphasized by both academics and practitioners (O'Dwyer and Owen, 2005; KPMG, 2013, 2015, 2017; PwC, 2018). The main benefits of assurance for SR include, but are not limited to, increased recognition, trust and credibility; reduced risk and increased value; improved management engagement; strengthened internal reporting and management systems; and improved stakeholder communication (AccountAbility, 2008; Corporate Register, 2008; Simnett *et al.*, 2009; Kolk and Perego, 2010; Cohen and Simnett, 2014; GRI, 2013b; Bellucci and Manetti, 2018). Kolk and Perego (2010) identify both internal and external benefits of assurance, both of which are often aimed at building trust and confidence in the areas of governance, management and stakeholder relations.

External assurance can increase the confidence of both the managers and the people who read these reports in terms of the quality of sustainability performance data, making it more likely that the data will be used for decision-making (Marx and Van Dyk, 2011; GRI, 2013a; Reimsbach *et al.*, 2016). KPMG (2017) emphasizes that: "assurance gives stakeholders, including investors, a greater sense of scrutiny that statements and claims made are clear, accurate and transparent." Indeed, assurance is recognized to reduce data quality risk associated with sustainability disclosure, increasing the value of reporting (GRI, 2013a). Seeking independent assurance also signals a commitment to corporate responsibility because the process exposes the company to greater scrutiny of its management systems (KPMG, 2017). It also provides a mechanism to drive improvements in these systems, thereby increasing their performance (Corporate Register, 2008; Brown-Liburd and Zamora, 2014).

In response to investors and other stakeholders, who tend to question the credibility of the information disclosed in SRs, companies are increasingly having their SRs assured by an

independent third party (Brown-Liburd and Zamora, 2014; Braam and Peeters, 2018; Briem and Wald, 2018). Various entities are currently involved in providing third-party assurance, including consultants, accounting firms and non-governmental organizations (De Beelde and Tuybens, 2015; Gürtürk and Hahn, 2016; Fuhrmann *et al.*, 2017; Hummel *et al.*, 2019). Sustainability assurance is a rapidly expanding industry (Garci'a-Benau *et al.*, 2013). However, in the absence of regulation, a manager can decide voluntarily whether to use a third party to perform assurance testing on a company's SRs (Braam and Peeters, 2018). Thus, the characteristics of the organization can influence the decision to seek SR assurance.

This study contributes to the ongoing research related to both social and environmental accounting and the various factors shaping the assurance industry (Kolk and Perego, 2010; Perego and Kolk, 2012; Fernandez-Feijoo, *et al.*, 2015, 2018a; Maroun, 2019). In particular, the study builds on the prior literature (Simnett *et al.*, 2009; Cho *et al.*, 2014; Michelon *et al.*, 2018) to expand the knowledge of the factors that influence SR assurance practices. We test new variables related to legitimacy issues (ethics controversies) and governance (overall quality of corporate governance). We also include factors that are already considered in the literature but adopt the original perspective of introducing alternative measures (e.g. the scope of national sustainability policies) or extending the prior research to different contexts (e.g. evidence of the influence of industry environmental sensitivity on assurance for EU-based organizations).

Another element of originality is that we manage to bring together elements from prior studies into a single, organic analysis. More specifically, our study aims to assess the relationship between managerial decisions and organizational characteristics, including the level of stakeholder engagement, the environmental performance, the national origins of the company, the corporate governance quality and the number of active controversies faced by the company. Testing the significance of these elements allows us to draw some conclusions in terms of the determining factors that might encourage the voluntary assurance of SRs. Thus, our research question (RQ) is as follows:

RQ. What are the most significant social, environmental and institutional determinants of SR assurance?

We answer this question by examining all the European listed companies that have issued at least one SR in the period between 2012 and 2016. An indicator variable is used to discriminate between companies that assure their SR and companies that do not make use of external assurance. We use a panel logit model to assess the influence of different social, environmental and institutional factors on the probability of having an SR assured.

As sustainability is a complex and multivariate concept we use two separate variables to assess a company's sustainability performance. We find that both social performances (measured in terms of stakeholder engagement) and environmental performances are positively associated with SR assurance. These results support the idea that the positive and the socio-political theoretical frameworks are both effective in explaining companies' decisions to assess their SRs (Simnett *et al.*, 2009; Braam and Peeters, 2018).

We confirm previous evidence showing that companies' decision to assure their SR is affected by a country's legal origin, but we also show that a country's level of engagement to sustainability policies is irrelevant. These results call for further research shedding light on the institutional variables influencing SR assurance.

Finally, our analysis enriches previous mixed results concerning the relationship between corporate governance and SR assurance. We show that an overall measure of corporate governance quality, which is a proxy for managers' attitude to act in the best interest of long term shareholders, is positively associated with SR assurance.

Section 2 of this article provides a theoretical framework for the development of our specific hypotheses concerning the determining factors for the voluntary assurance of SRs. Section 3 illustrates our quantitative research method, and Section 4 presents the main results of our analyzes. Section 5 illustrates the sensitivity analyzes performed. Section 6 discusses our findings in light of our theoretical framework while also presenting our conclusions, the practical implications of our work and opportunities for further research.

2. Theoretical framework and hypothesis development

Several theories can explain the decision to engage in sustainability reporting and voluntary assurance. This includes deciding whether to report voluntarily on sustainability issues, the format and content of the report, whether to have the report independently assured (Casey and Grenier, 2015) and determining the assurance provider and the scope and level of assurance (Braam and Peeters, 2018). This section will discuss how the interconnections between stakeholder theory, institutional theory, signaling theory and legitimacy theory informed the development of our hypotheses.

Assurance is deemed to advance internal reporting and improve communication with external stakeholders (Corporate Register, 2008; O'Dwyer and Owen, 2005). Stakeholder theory was originally formulated by practitioners in the field of management studies to benefit corporations and firms (Freeman, 1984). This theory stipulates that organizations must not only be accountable to investors and funders but also balance a multiplicity of stakeholder expectations and interests that can affect or can be affected by the actions of the organization (Freeman, 1984). Indeed, even corporate managers encounter demands from multiple stakeholder groups to devote resources to social and environmental issues (Matten *et al.*, 2003). Voluntary sustainability reporting and assurance are, thus, part of the dialogue between an organization and its stakeholders (Gray *et al.*, 1996; Adams, 2002). According to the scholarly literature, stakeholders who are given stronger strategic roles within the corporation are more likely to be satisfied with the company's activities and influence its disclosure policies and practices (Gray *et al.*, 1996). Furthermore, there is some evidence that financial stakeholders and regulators are the most effective in demanding voluntary disclosure (Neu *et al.*, 2001). From a practical standpoint, the need to define thresholds for non-financial information is often ignored because assurance providers tend to focus on stakeholder involvement and the materiality determination process (Mio, 2013). Recent scholarly literature stresses the need to increase stakeholders' commitment to and participation in sustainability reporting and assurance processes (Bini and Bellucci, 2020). Indeed, some studies note that the quality of SR is closely tied to stakeholder involvement (Thomson and Bebbington, 2005). Bellucci and Manetti (2018) similarly confirm that greater stakeholder commitment to sustainability reporting and assurance processes is beneficial because it enhances the credibility of reporting and leads to greater interaction with both the outside environment and the internal organization structure during decision-making processes (Gray *et al.*, 1996; Gray, 2000; Owen *et al.*, 2000). The greater the pressure deriving from stakeholders, the greater the need among organizations to provide trustful and material information in their SRs. Consequently, it is necessary to assess the degree to which a higher level of stakeholder commitment can persuade a company to have its SR assured by a third party.

However, this influence could also depend on factors that lie beyond the direct stakeholders of a company. Institutional theory considers the effects of pressure from supra-level structures such as countries or industries, on organizational practices (Delmas and Toffel, 2004; Fernandez-Feijoo, *et al.*, 2015, 2018b). Thus, according to institutional theory, a firm's decisions concerning the characteristics of its SR and its assurance are influenced by

political, social and economic systems (Chen and Bouvain, 2009; Cho *et al.*, 2014). Recent scholarship tends to use institutional theory to understand how the social context can influence the decision to implement sustainability reporting and assurance (Larrinaga-González, 2007; Welbeck, 2017; Fernandez-Feijoo *et al.*, 2018b). According to institutional theory, the decision to initiate the sustainability reporting process depends on several organizational dynamics and regulative, normative and cognitive drivers that are connected to the local context in which the organization is rooted (Bellucci and Manetti, 2018). However, companies may selectively disclose information that will portray them in a favorable light within their specific institutional ecosystem (Ball *et al.*, 2000; Gray, 2000; O'Dwyer and Owen, 2005). Against this background, further research is useful to address the question of whether organizational forces such as national policies on topics that are directly concerned with sustainability issues, affect the willingness of companies to resort to the voluntary assurance of SRs.

To understand the factors that push firms toward SR assurance, it is also necessary to consider the evolving preferences of customers and investors, who are increasingly attracted by responsible environmental and social company behaviors. Signaling theory claims that organizations voluntarily publish SRs as a means of pointing out how their values, goals and outcomes address diverse social, environmental and ethical issues (Clarkson *et al.*, 2011). Following this logic, organizations with good financial, social and environmental outcomes are motivated to disclose their performance to avoid problems of adverse selection (Clarkson *et al.*, 2011). Borghei *et al.* (2016) find that companies with superior environmental performance disclose more information about greenhouse gas emissions than other companies. According to signaling theory, corporations with better sustainability performance indicators should communicate their outcomes and impacts – and be interested in seeking third-party assurance – more often than those with lower performance levels. The latter group has the tendency to disclose partially, skip or even misrepresent their results (Thorne *et al.*, 2014). Thus, good sustainability performance should be positively associated with an organization's predisposition to disclose both social and environmental impacts and assure them (Clarkson *et al.*, 2011). The assurance of sustainability information generally enhances the credibility and improves the perceived reliability of SRs (Ackers, 2009; Edgley *et al.*, 2010; Perego and Kolk, 2012; Cohen and Simnett, 2014). Signaling theory also suggests that companies with superior corporate social performance voluntarily hire assurance specialists to signal their superior sustainability performance and that this is because the expected marginal benefits outweigh the costs of assurance (Braam and Peeters, 2018). In other words, companies with higher levels of social or environmental performance appear to be more interested in having their SR assured.

This interest is not related to the disclosure of outcomes and impacts only but it is also potentially connected to the disclosure of management practices and corporate governance mechanisms. Companies with high-quality corporate governance systems have an incentive to communicate to consumers and other stakeholders their superior accountability potential. In the literature, best management practices and elements of good corporate governance – e. g. presence of an audit committee, presence of an environmental committee, gender diversity, board independence, etc. – are often positively associated with non-financial disclosure extent and quality (Ho and Wong, 2001; Baalouch *et al.*, 2019; Nicolò *et al.*, 2019). Wang *et al.* (2019) examine the significance of different corporate governance mechanisms in explaining variations in the quality of integrated reports. It follows that companies with better corporate governance systems could be more likely to be interested in using external assurance for SR, to send a more trustworthy signal to their stakeholder about corporate values, corporate governance and management practices. In this perspective, SR assurance appears as a

mechanism to reduce agency problems and to improve management accountability toward shareholders and other stakeholders. Against this background, companies with high-quality corporate governance systems should have an incentive to adopt external assurance for SR.

This interest of companies in communicating their sustainability performance to consumers and other stakeholders also has implications in terms of legitimacy seeking. This means that organizations often use SRs to influence the ways in which stakeholders perceive the company's image, performance and impacts (Deegan *et al.*, 2002). Legitimacy theory is based on the idea that organizations issue SRs to reduce their external costs or diminish pressures that are being imposed by internal and external stakeholders or regulators (Adams, 2002; Tate *et al.*, 2010). As a result, voluntary disclosure and assurance of sustainability issues are often carried out for strategic reasons and to pursue a better adaptation to the institutional context. Independent assurance of SRs may increase the confidence of stakeholders in the integrity of companies, thus enhancing their corporate reputation (Simnett *et al.*, 2009; Casey and Grenier, 2015). Legitimacy theory predicts that companies that are subject to internal and external pressure due to poor sustainability performance may also use third parties to provide assurance (Braam and Peeters, 2018). In other words, they may use third-party assurance as a risk management tool that can actively manage the perceptions of investors and other stakeholders, as well as the credibility of the corporate social performances disclosed in SRs. Although Gray *et al.* (1996) confirm that companies that issue reports for strategic reasons are more inclined to improve their disclosures, even if their performance is negatively associated with their sustainability impacts, independent third-party assurance could help to deflect attention away from negative sustainability performance, reduce legitimacy risks, enhance the confidence of stakeholders and prevent interventions (Unerman, 2008; O'Dwyer *et al.*, 2011; Perego and Kolk, 2012). This could suggest that firms that are involved in ethical, social or environmental controversies could try to rely on assurance to restore the trust of stakeholders, communities and public institutions.

Against this theoretical framework and the interconnections between the different theories and contributions highlighted above, we set forth the following five hypotheses:

- H1.* Companies with higher levels of stakeholder commitment are more likely to have their SRs assured by a third-party.
- H2.* Companies that are based in countries with strong sustainability policies are more likely to have their SRs assured by a third-party.
- H3.* Companies with higher levels of environmental performance are more likely to have their SRs assured by a third-party.
- H4.* Companies that are often embroiled in controversies pertaining to ethical business practices are more likely to have their SRs assured by a third-party.
- H5.* Companies with high-quality corporate governance systems are more likely to have their SRs assured by a third-party.

3. Methodology

3.1 Model

To test our hypotheses, we conducted a panel regression analysis. As our dependent variable is a dummy, a logit model was used. A probit analysis was also performed as a robustness check. Logit and probit models are appropriate when the dependent variable

involves only two values and are widely used in managerial disciplines (Shook *et al.*, 2003; Hoetker, 2007). We opt for a random-effect model. This choice was driven by two considerations. Firstly, the paper aims to examine the effects of time-invariant characteristics, like country sustainability policies and industry, on SR assurance. A fixed-effect model does not allow researchers to understand how these factors affect the dependent variable. Secondly, some companies in our sample showed recurrent behavior. In fact, many of them decided to obtain external assurance on all the SRs that they issued, while others had no reports assured, leading to low intra-unit variability. This, in the case of an indicator variable as the dependent variable, hampers the predictive ability of a fixed-effect model.

Differently from previous studies, which consider both environmental and social performance in their measures, we consider these factors separately because they often produce different sustainability strategies. While environmental factors could be used by managers to rethink the company's business model, for example, by adopting innovative technologies, social factors are less directly related to the company's competitive advantage, even though they undoubtedly affect the bottom line. For this reason, we believe that a "signaling effect" should focus solely on environmental performance.

The data were winsorized at the first and ninety-ninth percentiles (Casey and Grenier, 2015). We used cluster-robust standard errors at the firm level (Petersen, 2009; Casey and Grenier, 2015). The model is expressed as follows:

$$\begin{aligned} SRA_{it} = & \alpha + \beta_1 SocScore_{it} + \beta_2 NationalCulture_{it} + \beta_3 FirmEnv_{it} + \beta_4 BusEthScore_{it} \\ & + \beta_5 CGScore_{it} + \beta_6 IndEnv_{it} + \beta_7 GRI_{it} + \beta_8 Size_{it} + \beta_9 Leverage_{it} \\ & + \beta_{10} Profitability_{it} + \text{Year controls} + \varepsilon \end{aligned} \quad (1)$$

where:

- SRA_{it} = a dummy variable that takes a value equal to one when a company decides to have the SR assured by a third party and zero otherwise;
- $SocScore_{it}$ = Thomson Reuters Social Score for company i at time t ;
- $NationalCulture_{it}$ = a dummy variable that takes a value equal to one for companies that are based in countries with strong sustainability policies and zero otherwise;
- $FirmEnv_{it}$ = Thomson Reuters Environmental Score for company i at time t ;
- $BusEthScore_{it}$ = Thomson Reuters Business Ethics Score for company i at time t ;
- $CGScore_{it}$ = Thomson Reuters Corporate Governance Score for company i at time t ;
- $IndEnv_{it}$ = a dummy variable that takes a value equal to one for companies that operate in environmentally sensitive industries and zero otherwise;
- GRI_{it} = a dummy variable that takes a value equal to one when a company issues the SR in accordance with GRI standards and zero otherwise;
- $Size_{it}$ = the natural logarithm of the total assets for company i at time t ;
- $Leverage_{it}$ = the debt to total assets ratio for company i at time t ; and
- $Profitability_{it}$ = the return on investment (ROI) for company i at time t .

3.2 Variables

Following previous studies on SR assurance (Kolk and Perego, 2010; Braam and Peeters, 2018), a dummy variable that takes a value of one when the SR is assured by an independent auditor (and zero when it is not) was used as a dependent variable in our model (SRA). To

test our hypotheses, we included independent variables that measure the stakeholder commitment, national sustainability policies, industry-level environmental impact, GRI adoption, environmental performance of individual firms and business ethics controversies. We also used control variables.

3.2.1 Independent variables. To test *H1*, which predicts a relationship between stakeholder commitment and SR assurance, we focused on the Thomson Reuters DataStream ASSET4 database (Ioannou and Serafeim, 2012; Cheng *et al.*, 2014), using the variable *SOCSCORE* in particular. This variable is built on publicly available information and primary sources. It is a measure – ranging from 0 to 100 – that assesses:

[...] a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It reflects the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.

It is widely used in the literature to assess stakeholder commitment (Wimmer, 2013; Hsu *et al.*, 2018; La Rosa *et al.*, 2018). For instance, La Rosa (2018) and his colleagues use this variable to assess whether higher stakeholder commitment reduces the cost of debt and affects a firm's capacity to access funding. Their findings show that companies with a higher social score have a lower cost of debt and can raise new debt more easily.

H2 states that companies based in countries with strong sustainability policies are more likely to use third-party SR assurance. Unlike previous studies on SR assurance, our research does not assess the legal aspects of a country's sustainability policies (Simnett *et al.*, 2009; Braam and Peeters, 2018) [1]. We feel that national classifications should adopt a perspective that extends beyond mere stakeholder orientation (La Porta *et al.*, 2000; Braam and Peeters, 2018) and confidence in the legal system (Simnett *et al.*, 2009). Thus, to assess the relationship between country origin and assurance, we used a variable that assesses how sustainability policies are embedded in a country's wider culture. To account for social and environmental factors in a broad and inclusive manner, our assessment of a country's sustainability levels is based on a classification scheme that has been developed by RobecoSAM, an investment specialist focused exclusively on sustainability investing [2]. In recent years, RobecoSAM has developed a classification system that considers factors such as aging, competitiveness, environmental risks, the legal system and corruption [3]. On the basis of RobecoSAM's country ranking, we created a dummy variable (national culture), namely, countries in the first quartile of the ranking were assigned a value of one, while the others were assigned a value of zero. Following this criterion, the countries in our sample were assessed as follows: the value one was given to Austria, Finland, Germany, Ireland, Luxembourg, The Netherlands, Sweden, Switzerland and the UK, while Belgium, France, Greece, Italy, Portugal, Slovenia and Spain were classified as zero.

H3 states that companies with higher environmental performance levels will be more likely to engage in SR assurance. To measure firm environmental performance, we used the Thomson Reuters DataStream *ENVSCORE* indicator. Among all the environmental indexes, *ENVSCORE* is considered as one of the best measures to assess how a company has used its resources and capabilities to perform its activities and how those activities actually affect the environment. In fact, this score is based on a company's impact on both living and non-living natural systems, including air, land, water and complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities to generate long-term shareholder value. Because of these characteristics, the *ENVSCORE* index is widely used in the literature. For instance, Dell'Atti *et al.* (2017) adopt this indicator to investigate the relationship between environmental

performance and reputation in the banking industry; [Jitmaneeroj \(2018\)](#) focuses on the association between environmental performance and firm value; and [Dal Maso et al. \(2018\)](#) investigate the association between environmental performance and financial performance.

To test *H4*, which proposes a link between controversies related to business ethics and a company's likelihood of engaging in SR assurance, the "business ethics score" variable from Thomson Reuters DataStream ASSET4 was used. This score is based on real or estimated penalties, fines from lost court cases, settlements or cases that have not been yet settled regarding controversies linked to business ethics in general, political contributions or bribery/corruption, price fixing or anti-competitive behavior, tax fraud and parallel imports or money laundering. This variable, which, to the knowledge of the authors, is not used in the previous corporate sustainability literature, is considered to be a suitable measure to assess how companies are involved in controversies related to sustainability issues.

Finally, *H5* predicts a positive relationship between governance and SR. We used the CGScore provided by Thomson Reuters Datastream ASSET4. This measure assumes values between 0 and 100 and is calculated on the basis of a company's systems and process, which ensure that its board members act in the best interest of long term shareholders. It reflects the capacity to direct and control its rights and responsibilities through best management practices and has been used in the literature to measure overall governance performance ([Qiu et al., 2016](#); [Li et al., 2018](#)).

3.2.2 Control variables. Control variables were included in the model to account for other factors that can affect the decision to have a CSR report assured by a third-party. To control for the relationship between an industry's environmental impact and the SR assurance, we adopted an industry classification scheme that assesses an industry's impact on the environment. We used the SIC code, which identifies the activities performed by certain industries, to determine whether an industry is either environmentally sensitive or non-environmentally sensitive. Following the classification proposed by [Patten \(1991, 2002\)](#), we considered companies that are operating in industries with an SIC code of 10xx (mining), 13xx (oil exploration), 26xx (paper), 28xx (chemical and allied products), 29xx (petroleum refining), 33xx (metals) and 49xx (utilities) as being environmentally sensitive. [Patten \(1991, 2002\)](#) uses this classification to verify the impact of industry classification on social and environmental disclosure. Similarly, [Cho and Patten \(2007\)](#) use this classification to assess whether companies in environmentally sensitive industries disclose more non-monetary information than companies in non-environmentally sensitive industries. We used Patten's classification to build a dummy variable (IndEnv) that applies a value of one to companies operating in environmentally sensitive industries and a value of zero to those operating in non-environmentally sensitive industries. The industry data were collected from Thomson Reuters DataStream.

Among other exogenous factors, [Peters and Romi \(2015\)](#) show that, in the US context, SR assurance is positively related to a company's adoption of the GRI standards. To extend this evidence to the European context, we included a control variable related to a company's GRI standard implementation variable. In line with [Peters and Romi \(2015\)](#), we created a dummy variable that applies a value of one to SRs that have been prepared in accordance with the GRI principles and zero to the remainder (the variable named *GRI*). We obtained data about reports' adherence to the GRI standards from the GRI database.

Finally, following previous research, we included control variables for firm size, leverage and profitability ([Simnett et al., 2009](#); [Casey and Grenier, 2015](#); [Braam and Peeters, 2018](#)). We measured size as the natural logarithm of total assets ([Sierra et al., 2013](#); [Braam and Peeters, 2018](#)). Leverage was measured by establishing a ratio between debt and total assets ([Simnett et al., 2009](#); [Braam and Peeters, 2018](#)). Profitability was measured via the return on

investment (Prencipe, 2004). All the financial data were retrieved from Thomson Reuters DataStream. The relationship between each hypothesis formulated and the variables used is synthetized in Appendix 1.

3.3 Data set

Our analysis focuses on listed companies that are based in Europe and published at least one SR between 2012 and 2016. We used the GRI database to identify organizations that meet these criteria, as it contains a list of all the companies that have published an SR in recent years. We also obtained data about SR assurance from the GRI database.

We found that 630 European companies published an SR report in the period under investigation. We excluded 213 companies because of missing data, leaving us with a final sample of 417 European companies (Table 1) and 1,596 firm-year observations. Like many previous studies on SR assurance (Simnett *et al.*, 2009; Martínez-Ferrero and García-Sánchez, 2016), our data set is an unbalanced panel because some companies did not produce an SR in each year under investigation.

4. Results

The descriptive statistics show that fewer than half of the SRs are assured (45%) and 50% of them are prepared in accordance with the GRI principles (Table 2). Looking at the statistics on a per year basis, we can see a slight decrease from 2012 to subsequent years in both assurance of SRs and GRI adoption.

The variable *SocScore*, *FirmEnv* and *BusEthScore* range from 0 to 100, where 0 is the minimum and 100 is the maximum score. The descriptive statistics indicate that the companies have high average levels of stakeholder commitment (*SocScore* mean value of 80.8) and environmental performance (*FirmEnv* mean value of 79.7). These values are stable over time, with mean values for *SocScore* and *FirmEnv* reaching their peaks in 2016, which could indicate greater attention to social and environmental performance in the most recent year.

Table 1.
Companies
breakdown by
country

Country	No. of companies
Austria	10
Belgium	15
Finland	24
France	69
Germany	52
Greece	8
Ireland	5
Italy	25
Luxemburg	5
The Netherlands	17
Portugal	4
Spain	26
Sweden	1
Switzerland	1
UK	155
Total	417

Table 2.
Descriptive statistics

Variable	2012			2013			2014			2015			2016			2012–2016		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
<i>SRA</i>	0.5	0	0.5	0.46	0	0.49	0.46	0	0.49	0.46	0	0.5	0.43	0	0.5	0.45	0	0.5
<i>SocScore</i>	80.8	88.4	18.9	78.7	86.5	19.9	79.1	87.2	20	81.7	90	20.1	84.4	90.4	16.4	80.8	88.7	19.3
<i>FirmEnv</i>	79.7	87.9	19.1	78	87.5	20.5	77.2	86.9	20.7	80.4	89.6	20.4	83.3	91.5	17.8	79.7	88.7	19.9
<i>CGScore</i>	68.3	73.8	21.8	65.1	72.5	23.8	66	72.3	23.4	65.9	72.3	24.7	68.4	75	23.7	66.6	73.2	23.5
<i>BusEthScore</i>	50.1	50.8	4.6	51	52.2	6.1	50.9	52.9	7.9	50.5	52.7	8.4	50.1	52.5	8.7	50.5	52.5	7.3
<i>GRI</i>	0.6	1	0.5	0.5	1	0.5	0.5	0	0.5	0.5	0	0.5	0.5	0	0.5	0.5	1	0.5
<i>Size</i>	15.8	15.6	2.1	15.6	15.4	2	15.6	15.3	2.1	15.6	15.4	2.1	15.7	15.5	2.1	15.6	15.4	2.1
<i>Leverage</i>	42.3	41.6	25.1	42.3	40.4	26.2	42.2	41	25.7	42	40.4	26.7	41.6	40.7	26	42.1	40.6	26
<i>Profitability</i>	7.7	6.8	9.1	7.0	6.6	9.9	7.5	6.6	10.4	7.2	6.2	10.9	6.6	6.6	10.8	7.2	6.6	10.3

Table 3 exhibits that most of the companies show recurrent behaviors concerning the decision to assure their SR: many companies (49% of the total sample) never assure the SR in the period under investigation, while little less than one-third (32%) assure the SR in all the years a report is issued. Hence, companies tend to be consistent in their decision to use third-party assurance, with low intra-unit variability.

The correlation matrix does not show collinearity problems (Table 4). The only coefficients that might pose a problem are stakeholder commitment (*SocScore*) and environmental performance (*FirmEnv*). To determine whether there are collinearity problems, we calculated the variance inflation factor (VIF) after the regression model. As the VIF indicates “how much of the estimated variance of the *i*th regression coefficient is increased above what it would be if R_i^2 equaled zero” (O’Brien, 2007, p. 674), it is considered to be an intuitive measure of multi-collinearity. A generally accepted rule of thumb is that a VIF higher than 10 indicates a multi-collinearity problem. The VIFs for the two variables under investigation are 2.31 for *SocScore* and 2.22 for *FirmEnv*, so we can safely conclude that there are no collinearity problems.

As expected, variables related to stakeholder commitment (*SocScore*), governance score (*CGScore*), industry environmental sensitivity (*IndEnv*), GRI standard adoption (*GRI*), company size (*Size*) and company leverage (*Leverage*) are positively correlated with SRA. The negative correlation between the variables *national culture* and SRA seems to indicate that companies operating in countries that have weak sustainability policies are more likely to have their reports assured.

Table 5 shows that a company’s stakeholder commitment (*SocScore*) is positively and significantly associated with SRA, thereby supporting *H1*. As companies with a higher level of stakeholder commitment need to pay more attention to sustainability issues, they are more likely to assure their reports to enhance the credibility of their sustainability communication. This result is in line with prior studies that find a positive relationship between a greater need to enhance credibility in response to stakeholder pressures and the decision to assure the SR (Simnett *et al.*, 2009; Hummel and Schlick, 2016).

The variable that addresses national sustainability policies (*national culture*) is significantly associated with SR assurance. However, our *H2* is not confirmed because the variable shows a negative coefficient, contrary to our expectation. One possible explanation could be that companies operating in countries with weak environmental policies need to gain more legitimacy in the eyes of their stakeholders; thus, they tend to use SR assurance as a legitimacy tool.

The relationship between environmental performance (*FirmEnv*) and SR assurance is significant, thereby supporting *H3*. This suggests that companies use SR assurance as a mechanism to tout strong performances, in line with signaling theory.

Our *H4* is supported, as the business ethics score has a negative and moderately significant relationship with SR assurance. Indeed, companies with a low score – meaning more controversies involving business ethics – are more likely to have their SRs assured.

Table 3.

Companies that show
recurrent behaviors

	No.	(%) on total
Number of companies in the sample	417	100
Consistent	337	81
Always assure the SR	133	32
Never assure the SR	204	49

	SR4	SocScore	National culture	FirmEnv	BusEthScore	CGScore	IndEnv	GRI	Size	Leverage
<i>SocScore</i>	0.413*** (0.000)	–0.232*** (0.000)								
<i>National culture</i>	–0.199*** (0.000)	0.730*** (0.000)	–0.212*** (0.000)							
<i>FirmEnv</i>	0.363*** (0.000)	–0.110*** (0.000)	–0.045* (0.055)	–0.1124*** (0.000)						
<i>BusEthScore</i>	–0.142*** (0.000)	0.220*** (0.000)	0.134*** (0.000)	–0.204*** (0.000)	–0.123*** (0.000)					
<i>CGScore</i>	0.096*** (0.000)	0.170*** (0.000)	–0.016 (0.461)	0.097*** (0.000)	–0.094*** (0.000)	0.001 (0.972)				
<i>IndEnv</i>	0.141*** (0.000)	0.324*** (0.000)	–0.083*** (0.000)	0.309*** (0.000)	–0.052*** (0.031)	–0.090*** (0.000)	0.126*** (0.000)			
<i>GRI</i>	0.559*** (0.000)	0.400*** (0.000)	–0.167*** (0.000)	0.430*** (0.000)	–0.304*** (0.000)	0.075*** (0.002)	0.064*** (0.003)	0.225*** (0.000)		
<i>Size</i>	0.389*** (0.000)	0.177*** (0.000)	–0.207*** (0.000)	0.199*** (0.000)	–0.088*** (0.000)	–0.021 (0.395)	–0.027* (0.204)	0.158*** (0.000)	0.376*** (0.000)	
<i>Leverage</i>	0.151*** (0.000)	–0.130*** (0.000)	0.169*** (0.000)	–0.176*** (0.000)	0.028 (0.283)	–0.081*** (0.000)	–0.1103*** (0.000)	–0.132*** (0.000)	–0.1103*** (0.000)	–0.354*** (0.000)
<i>Profitability</i>	–0.083*** (0.000)									

Notes: ***Denotes significance at the 0.01 level, **denotes significance at the 0.05 level, *denotes significance at the 0.1 level

Table 4.
Correlation matrix

Table 5.
Logit regression
results

Dependent variable: <i>SRA</i>	Predicted sign	Unbalanced panel
<i>Const</i>		−18.691*** (3.550)
<i>SocScore</i>	+	0.053*** (0.016)
<i>National culture</i>	+	−1.601*** (0.497)
<i>FirmEnv</i>	+	0.031* (0.017)
<i>BusEthScore</i>	−	−0.057** (0.030)
<i>CGScore</i>	+	0.026*** (0.009)
<i>IndEnv</i>		0.366 (0.490)
<i>GRI</i>		5.276*** (0.648)
<i>Size</i>		0.696*** (0.172)
<i>Leverage</i>		−0.012 (0.009)
<i>Profitability</i>		0.006 (0.018)
<i>Year controls</i>		Yes
<i>Wald χ^2</i>		104.59***
<i>Observations</i>		1596
<i>Correct predictions</i>		81.39%

Notes: ***Denotes significance at the 0.01 level; **denotes significance at the 0.05 level; *denotes significance at the 0.1 level

This may indicate that companies that have lost legitimacy due to ethical controversies tend to use third-party assurance as a tool to regain stakeholder trust.

Finally, the positive and significant relationship between *CGScore* and *SR* assurance supports *H5*. Hence, companies with better corporate governance systems are more likely to use external assurance for *SR*. This seems to suggest that companies with higher corporate governance quality value *SR* assurance as a mechanism to reduce agency problems and improves management accountability toward shareholders.

Among the control variables, *GRI* adoption (*GRI*) and companies' size (*Size*) are significantly associated with *SRA*. The *GRI* standards recommend that companies have an independent actor assure their *SR*. As there are significant differences in *SR* assurance practices between *GRI* adopters and other companies, it is safe to say that adherence to *GRI* standards is not just a formality for many organizations but rather has a sizable impact on sustainability reporting. The positive relationship between company size and *SRA* indicates that large companies that face greater pressure and deal with a wider array of stakeholders are more likely to assure their *SR*. This is in line with previous findings on *SR* assurance practices (Simnett *et al.*, 2009; Braam and Peeters, 2018). Surprisingly, no significant relationship is found between an industry's environmental impact and the decision to assure *SR*. This may indicate that companies do not consider external assurance as a mechanism to reduce the perception of environmental risks. It also seems to indicate that there are no common industry practices that influence the decision to assure *SRs*.

5. Sensitivity analyses

We ran sensitivity analyses to address the potential concerns that affect our research design and to strengthen our results further. Detailed explanations of the analyzes that were conducted are provided in the following paragraphs.

5.1 Use of a balanced sample

Although unbalanced panel data sets are largely used in previous studies (Simnett *et al.*, 2009; Martínez-Ferrero and García-Sánchez, 2016), they may introduce estimation bias,

which affects the interpretation of the results. Thus, we reran the analysis on a balanced panel sample including continuous SR issuers in the period under examination only (Martínez-Ferrero *et al.*, 2018). The inclusion of continuous issuers only restricts the firm-year observations to 949. The results of the sensitivity analyzes conducted on continuous issuers (Table 6) show a difference from the main analysis concerning business ethics controversies (BusEthScore) (H4). According to these results, companies that publish an SR on a regular basis make their decision to assure the SR independently from their number of business ethics controversies.

When we restrict the sample to continuous issuers only, we observe that the percentage of companies that show recurrent behaviors is slightly lower (76.7% compared to 80.8% in the full sample), but the percentage of companies that always assure the SR increases from 31.9% to 47.7%. This finding indicates that companies that consistently issue a SR more likely obtain external assurance in all the periods. Hence, the difference in the significance of the number of business ethics controversies might be driven by the lower importance of SR assurance as a legitimizing mechanism for those companies that consistently issue (and more likely assure) the SR.

5.2 Potential endogeneity and reverse causality

The second issue is related to the potential endogeneity and reverse causality problems that may arise in the assessment of the relationship between the decision to have an SR assured and the environmental and social performance measures. In line with previous accounting research (Dhaliwal *et al.*, 2011; Zhou *et al.*, 2018), we re-estimated the model using lagged values for *SocScore*, *FirmEnv*, *BusEthScore* and *CGScore* to mitigate this effect. In other words, we estimated equation (1), replacing the values of *SocScore*, *EnvScore*, *BusEthScore* and *CGScore* for firm *i* at time *t* with the values that these variables assume for firm *i* at time *t*-1 (*SocScore_{it-1}*; *FirmEnv_{it-1}*; *BusEthScore_{it-1}*; *CGScore_{it-1}*). These results (Table 7) confirm that stakeholder commitment and corporate governance performance are positively and significantly associated with SR assurance both when using an unbalanced sample and when using a balanced sample. When lagged values are used, national sustainability policies are weakly significant in the case of unbalanced sample and not significant in the

Dependent variable: SRA	Hypothesis tested	Unbalanced panel	Balanced panel
<i>Const</i>			-23.188*** (5.407)
<i>SocScore</i>	H1	Positive and significant	0.062*** (0.021)
<i>National culture</i>	H2	Negative and significant	-1.410** (0.715)
<i>FirmEnv</i>	H3	Positive and significant	0.069*** (0.025)
<i>BusEthScore</i>	H4	Negative and significant	-0.059 (0.048)
<i>CGScore</i>	H5	Positive and significant	0.045*** (0.013)
<i>IndEnv</i>			0.383 (0.679)
<i>GRI</i>			4.270*** (0.702)
<i>Size</i>			0.772*** (0.255)
<i>Leverage</i>			-0.015 (0.013)
<i>Profitability</i>			-0.036 (0.025)
<i>Year controls</i>			Yes
<i>Wald χ^2</i>			70.90***
<i>Observations</i>			949
<i>Correct predictions</i>			83.35%

Notes: ***denotes significance at the 0.01 level; **denotes significance at the 0.05 level

Table 6.
Comparison between
unbalanced and
balanced samples

Table 7.
Logit model with
lagged variables

Dependent variable: SRA	Unbalanced panel	Balanced panel
<i>Const</i>	−20.873*** (4.249)	−25.113*** (5.846)
<i>SocScore</i>	0.060*** (0.019)	0.091*** (0.028)
<i>National culture</i>	−0.995* (0.551)	−0.941 (0.789)
<i>FirmEnv</i>	0.028 (0.018)	0.030* (0.024)
<i>BusEthScore</i>	−0.026 (0.033)	−0.038 (0.038)
<i>CGScore</i>	0.026*** (0.010)	0.043*** (0.013)
<i>IndEnv</i>	0.294 (0.524)	0.109 (0.701)
<i>GRI</i>	5.638*** (0.820)	4.597*** (0.820)
<i>Size</i>	0.711*** (0.201)	0.860*** (0.300)
<i>Leverage</i>	−0.009 (0.011)	−0.005 (0.015)
<i>Profitability</i>	−0.002 (0.020)	−0.027 (0.022)
<i>Year controls</i>	Yes	Yes
<i>Wald χ^2</i>	68.31***	51.93***
<i>Observations</i>	1,136	757
<i>Correct predictions</i>	68.17%	77.66%

Notes: ***Denotes significance at the 0.01 level *denotes significance at the 0.1 level

case of balanced sample. Firm environmental performance is significant only when a balanced sample is used. The business ethics score is not associated with the probability of having an SR assured both when an unbalanced and when a balanced sample are used. As in the first sensitivity analysis, these results confirm *H1* and *H5* and strengthen the findings of the main analysis. The results obtained for firm environmental performance (*H2*) and business ethics controversies (*H4*) contrast with the findings in the main analyzes.

5.3 Different model specifications

To enhance the robustness of our findings, we ran our data through a probit model, an alternative approach to data analysis that uses a binary dependent variable. We conducted probit analyzes on both the unbalanced and the balanced panel sample. The results confirm the findings of the logit models discussed earlier both for the unbalanced and for the balanced sample (Table 8). The probit models confirm the positive and significant impact of stakeholder commitment (*H1*), firm environmental performance (*H3*) and corporate governance (*H5*) on the likelihood of engaging in SR assurance. Moreover, the negative and significant impact of national culture on SR assurance (*H2*) is confirmed. Finally, probit analysis shows that the business ethics score (*BusEthScore*) (*H4*) is only weakly significantly associated with SR assurance when using the unbalanced sample and not significantly associated with SRA when the analysis is restricted to continuous SR issuers.

5.4 Isolation of United Kingdom companies

As UK companies have a notable weight in our sample, observations related to these companies may have influenced our results. To account for the strong presence of UK companies, we estimated the model again, isolating the UK companies from the others. The results show that stakeholder commitment (*SocScore*) is positively associated with SRA both when we consider UK companies only and when we consider companies from other countries (Table 9). The negative and significant relationship between national sustainability policies (national culture) and SRA and the positive and significant influence of firm environmental performance and corporate governance that were found in the main

Table 8.

Probit regression
results

Dependent variable: SRA	Unbalanced panel	Balanced panel
<i>Const</i>	−10.472*** (1.985)	−12.965*** (3.027)
<i>SocScore</i>	0.029*** (0.009)	0.035*** (0.012)
<i>National culture</i>	−0.892*** (0.293)	−0.781* (0.421)
<i>FirmEnv</i>	0.017* (0.010)	0.038*** (0.015)
<i>BusEthScore</i>	−0.030* (0.016)	−0.032 (0.026)
<i>CGScore</i>	0.014*** (0.005)	0.025*** (0.007)
<i>IndEnv</i>	0.222 (0.292)	0.228 (0.411)
<i>GRI</i>	2.799*** (0.332)	2.321*** (0.375)
<i>Size</i>	0.394*** (0.098)	0.434*** (0.146)
<i>Leverage</i>	−0.007 (0.005)	−0.008 (0.007)
<i>Profitability</i>	0.003 (0.010)	−0.020 (0.014)
<i>Year controls</i>	Yes	Yes
<i>Wald χ^2</i>	113.51***	72.85***
<i>Observations</i>	1,596	949
<i>Correct predictions</i>	80.51%	83.67%

Notes: ***Denotes significance at the 0.01 level; *denotes significance at the 0.1 level

Table 9.

Comparison between
the UK and other
countries

Dependent variable: SRA	UK	Others
<i>Const</i>	−22.353*** (5.772)	−19.198*** (4.783)
<i>SocScore</i>	0.075** (0.032)	0.043** (0.019)
<i>National culture</i>		−1.419** (0.609)
<i>FirmEnv</i>	−0.005 (0.029)	0.049*** (0.022)
<i>BusEthScore</i>	−0.073*** (0.034)	−0.042 (0.051)
<i>CGScore</i>	0.011 (0.310)	0.035*** (0.011)
<i>IndEnv</i>	1.151 (1.018)	−0.003 (0.592)
<i>GRI</i>	3.805*** (0.994)	5.808*** (0.868)
<i>Size</i>	1.016*** (0.332)	0.597*** (0.215)
<i>Leverage</i>	−0.015 (0.017)	−0.013 (0.012)
<i>Profitability</i>	0.012 (0.028)	0.003 (0.026)
<i>Year controls</i>	Yes	Yes
<i>Wald χ^2</i>	57.49***	63.72***
<i>Observations</i>	559	1,037
<i>Correct predictions</i>	80.50%	82.35%

Notes: ***Denotes significance at the 0.01 level; **denotes significance at the 0.05 level

analysis hold when UK companies are excluded. Thus, we can affirm that these effects are not driven by UK companies.

However, firm environmental performance quality is not significantly associated with SRA in UK companies. This result can be explained by the fact that the UK were the first country to regulate environmental disclosure. In this country, large companies have had to disclose non-financial information, as the enforcement of the new Companies Act in 2013. Baboukardos (2017) finds that the negative impact of GHG emission disclosures on market values has declined, as the enforcement of the Companies Act 2013 and attributes this result

to the effect of the regulation on investor perception of such information. This circumstance might lead stakeholders to perceive UK companies environmental more effective and reliable. In this context, SR assurance is not considered by manager as a mechanism that can be used to enhance sustainability more credible.

Interestingly, the coefficient related to the business ethics score (BusEthScore) is significant for the UK companies but not for the others. Hence, the results of the main model can be driven by UK companies with respect to the impact of business ethics controversies. Both when excluding the UK from the sample and when considering the UK in isolation, the positive and significant effects of GRI adoption and size are confirmed as well as the non-significance of industry effects.

5.5 Different measures for country classification

In the main analysis, we used a novel country classification based on sustainability policies. To shed more light on this issue, we resorted to a traditional and widely adopted country classification, which is based on legal aspects.

Following previous studies, we distinguished between stakeholder-oriented and shareholder-oriented countries regarding legal systems (Simmnett *et al.*, 2009; Braam and Peeters, 2018). In line with these pieces of research, common law countries are considered as being shareholder oriented, while code law countries are considered as being stakeholder oriented (La Porta *et al.*, 1997, 2000). Thus, the UK and Ireland are considered as shareholder-oriented countries, while the other European countries are considered as stakeholder-oriented countries. A dummy variable (*StakeholderOrientation*) that takes the value one for stakeholder-oriented countries and zero otherwise was introduced (Simmnett *et al.*, 2009; Braam and Peeters, 2018).

We estimated the same models and replaced the dummy variable based on country sustainability policies with the variable that considers legal systems. In line with prior studies that find a significant effect of the legal system on the assurance of SR (Kolk and Perego, 2010; Braam and Peeters, 2018), the findings (Table 10) show that the variable *StakeholderOrientation* is significantly associated with SRA.

Dependent variable: SRA	Unbalanced panel	Balanced panel
<i>Const</i>	−21.821*** (3.529)	−25.971*** (5.227)
<i>SocScore</i>	0.054*** (0.016)	0.065*** (0.021)
<i>StakeholderOrientation</i>	1.695*** (0.628)	0.641 (0.914)
<i>FirmEnv</i>	0.029 (0.018)	0.064** (0.026)
<i>BusEthScore</i>	−0.056* (0.031)	−0.053 (0.047)
<i>CGScore</i>	0.036*** (0.010)	0.046*** (0.014)
<i>IndEnv</i>	0.414 (0.492)	0.342 (0.683)
<i>GRI</i>	5.069*** (0.653)	4.224*** (0.747)
<i>Size</i>	0.717*** (0.174)	0.847*** (0.254)
<i>Leverage</i>	−0.010 (0.009)	−0.011 (0.012)
<i>Profitability</i>	0.005 (0.018)	−0.036 (0.025)
<i>Year controls</i>	Yes	Yes
<i>Wald χ^2</i>	105.20***	70.91***
<i>Observations</i>	1,596	949
<i>Correct predictions</i>	81.64%	82.61%

Table 10.
Logit model using
country classification
based on legal
systems

Notes: ***Denotes significance at the 0.01 level; **denotes significance at the 0.05 level; *denotes significance at the 0.1 level

5.6 Use of a combined environmental and social score

In the main study, we used separate measures for firms' social and environmental performance. This choice was motivated by the fact that we consider these two aspects as different dimensions related to a company's behavior. However, previous studies use a single score that results from the combination of social and environmental performance (Cheng *et al.*, 2014; Clarkson *et al.*, 2015; Braam and Peeters, 2018). In line with previous studies (Cheng *et al.*, 2014; Clarkson *et al.*, 2015), we built a combined score as the average of the social and environmental scores. Untabulated results confirm that a company's performance concerning sustainability issues is positively related to SR assurance [4], strengthening the results in the main analysis. The signs and significance levels of the coefficients related to national sustainability policies, business ethics controversies and GRI adoption remain the same as in the main analysis.

5.7 Discussion of the sensitivity analysis results

Ultimately, the sensitivity analyzes confirm that stakeholder commitment and corporate governance quality are positively and significantly associated with SR assurance. In light of this, *H1* and *H5* are fully supported. Regarding national culture (*H2*), most of the sensitivity tests conducted support the negative and significant relationship between country sustainability policies and SR assurance. Additionally, our sensitivity analysis show that our results are aligned with previous evidence showing that companies in stakeholder-oriented countries are more likely to assure their SRs. Overall, these findings show that different institutional variables – sustainability policies and legal system – have different impact on assurance.

Contrarily to the main analysis, business ethics controversies (*H4*) do not influence SR assurance when restricting the sample to continuous issuers. Hence, the significant coefficients found in the main analysis can be strongly determined by non-continuous issuers in the unbalanced panel sample.

Both business ethics score (*H4*) and firm environmental performance (*H3*) are no longer significant when lagged values are used. This result may indicate that these two variables suffer from endogeneity. This is related to the presence of potential unobserved factors that are correlated with both the score and the decision to have the SR assured.

Finally, the sample composition plays a role in SR assurance practices. The business ethics score is no longer significant when UK companies are excluded. Firm environmental performance and corporate governance quality are not associated with SR assurance when only companies based in the UK are considered. Thus, the influence that firm environmental performance, business ethics controversies and corporate governance have on SR assurance is influenced by the sample composition.

6. Discussion and conclusions

As SR use has increased in recent years (KPMG, 2013), companies have started to use third-party assurance to enhance the credibility of their reports (O'Dwyer *et al.*, 2005; Simnett *et al.*, 2009). Generally, companies decide to assure their SRs on a voluntary basis. Assurance serves as a useful control mechanism to enhance the credibility of the disclosed information and facilitate greater user confidence (Blackwell *et al.*, 1998; Carey *et al.*, 2000). The reasons for companies' decision to use assurance services have not received much scholarly attention, a phenomenon that can be explained by the relatively recent emergence of social reporting (Braam and Peeters, 2018). This study refers to the interconnections of different theoretical frameworks – stakeholder theory, institutional theory, signaling theory and

legitimacy theory – to investigate sustainability reporting and explain the factors that influence a company's decision to assure its SR (Cohen and Simnett, 2014).

As highlighted by Hummel *et al.* (2019) research on sustainability assurance is still in its beginnings and more evidence is needed. Our findings enrich previous evidence about the determinants of SR assurance, corroborating some previous relationships and testing new variables not previously examined.

Earlier studies used economic theories such as agency theory and social-political theories (legitimacy and stakeholder theories), to investigate the relationship between corporate characteristics and the decision to assure a SR. Our results corroborate previous evidence showing that the two theoretical frameworks are both effective in explaining companies' decisions (Simnett *et al.*, 2009; Braam and Peeters, 2018). Differently from previous studies (Casey and Grenier, 2015; Braam and Peeters, 2018) we use two separate variables to assess a company's sustainability performance because environmental and social performance could be driven by different forces (Verbeeten *et al.*, 2016). Our evidence shows that both companies with higher social performance, measured in terms of stakeholder engagement and higher environmental performance are more likely to assure their SRs. Our sensitivity analyzes confirm these results.

In keeping with the hypothesis that companies with legitimacy issues use SR assurance to strengthen or restore their relationship with their stakeholders (O'Dwyer *et al.*, 2011; Perego and Kolk, 2012), our paper is the first to test whether companies with higher legitimacy issues, measured by the number of ethic controversies, are more likely to assess their SRs. Our findings do not fully support this view, as we found a significant relationship between business ethics controversies and SR assurance only in the main analysis and not in our sensitivity analyzes. These controversial results could be influenced by the difficulties in assessing the relevance of different controversies for each firm.

Previous studies document a positive relation between a company's country origins on its decision to assure its SR. More specifically, they show that companies in stakeholder-oriented countries are more likely to assure their SRs (Braam and Peeters, 2018; Simnett *et al.*, 2009). Our results confirm these results. We also try to enrich our knowledge about the influence of institutional factors on assurance decisions, by testing whether a country engagement toward environmental and social policies affects companies' behavior. Our main analysis shows that companies in non-environmentally sensitive countries tend to use SR assurance more consistently than companies in environmentally sensitive countries – a result that defied our earlier expectations. It seems that companies in non-environmentally sensitive jurisdictions need to assure their report to increase the credibility of their information. This result holds when restricting the sample to continuous issuers only.

We also show that companies with better governance systems more likely assure their SRs. Previous studies on this issue show mixed results. Some studies find that traditional corporate governance elements – such as the features of the board of directors or the presence of an audit committee – have little impact on non-financial reporting and assurance (Brammer and Pavelin, 2006; Liao, Lin and Zhang, 2018). Other studies focusing on sustainability-oriented governance mechanisms – such as the presence of an environmental committee and/or a Chief Sustainability Officer – identify a positive effect on non-financial disclosure and assurance practices (Wang *et al.*, 2019; Ntim, 2016; Peters and Romi, 2015; Flammer, Hong and Minor, 2019). We contributed to this strand of literature by using a composite index (CGScore), that is, widely used to assess corporate governance quality (Qiu *et al.*, 2016; Li *et al.*, 2018). Future research could selectively focus on single sub-categories of the CGScore to investigate the effect of specific aspects (composition of the boards,

compensations policy, integration with environmental performances, etc.) on assurance behavior.

Interestingly, our results show the absence of a relation between industries' environmental impact and the probability of engaging in SR assurance, extending the evidence provided Casey and Grenier's (2015) for the US context. This may be explained by noting that environmentally sensitive industries are subject to intense regulatory oversight that might act as an alternative form of SR assurance (Casey and Grenier, 2015). Our findings suggest also that companies that prepare SRs in accordance with the GRI principles are more likely to assure their reports. This corroborates previous studies showing that the adoption of GRI standards produces an isomorphic effect that often results in high-quality reporting practices (Cho *et al.*, 2014; Peters and Romi, 2015) and contribute to the literature by documenting the influence of GRI adherence on the demand for external assurance in the EU context.

Finally, our analysis show that companies issuing SRs on a regular basis are more likely to use external assurance. This finding might indicate the presence of "virtuous" companies, which are highly committed to sustainability disclosure and are consistent in the use of external assurance as well. Future research could focus on these companies to understand whether and how they differ from other companies.

In terms of the limitations of our research, it is worth pointing out that our database is composed of SRs that have been added to the GRI database on a voluntary basis. However, the number of assured companies in our sample is similar to the number of assured companies found in other studies (Braam and Peeters, 2018).

Notes

1. Simnett *et al.* (2009) rely on the "rule of law" developed by the World Bank, while Braam and Peeters (2018) distinguish between countries with common law and countries with codified laws.
2. RobecoSAM is a pioneer in the development, construction and application of indices specifically for use by the asset management industry and more broadly in driving the sustainability movement worldwide. Since 1999, it has been collaborating with S&P Dow Jones Indices in the development of the Dow Jones Sustainability Indices (<http://database.globalreporting.org/>).
3. The RobecoSAM rating is based on 17 indicators – environmental status, energy, environmental risk, social indicators, human development, social unrest, liberty and inequality, competitiveness, political risk, effectiveness, rule of law, accountability, corruption, stability, regulatory quality, aging and institutions – each of which is calculated on the basis of several sub-indicators and weighted. The ranking is used to determine the country's weights in the S&P ESG Sovereign Bond Index Family. More information is available at <https://www.robecosam.com/en/>
4. Untabulated results are available from the authors on request.

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Appendix

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Table A1.

Variables used for
hypothesis testing

Hypothesis	Measure	Variable name
Stakeholder commitment (<i>H1</i>)	SOCSSCORE (DataStream; Wimmer, 2013; Hsu <i>et al.</i> , 2018; La Rosa <i>et al.</i> , 2018)	<i>SocScore</i>
Country environmental culture (<i>H2</i>)	National classification based on RobecoSAM ranking	<i>National culture</i>
Firm environmental performance (<i>H3</i>)	SCORE (DataStream; Dell'Atti <i>et al.</i> , 2017; Jitmaneeroj, 2018)	<i>FirmEnv</i>
Business ethics controversies (<i>H4</i>)	Business ethics score (DataStream)	<i>BusEthScore</i>
Corporate governance (<i>H5</i>)	CGVSCORE (DataStream; Qiu <i>et al.</i> , 2016; Li <i>et al.</i> , 2018)	<i>CGScore</i>

About the authors

Lorenzo Simoni (PhD) is a Research Fellow in Accounting at the Department of Economics at the University of Genoa and Adjunct faculty member in Accounting at the Department of Economics and Management at the University of Florence. His main research interests are financial and extra-financial reporting, business model, sustainability reporting and performance measurement.

Laura Bini (PhD) is Assistant Professor in Accounting at the University of Florence, Department of Economics and Management. Her main research interests are in the area of non-financial disclosure to financial markets, including non-financial disclosure regulation, impression management, narrative disclosure quality and performance measurement. Laura Bini is the corresponding author and can be contacted at: lbini@unifi.it

Marco Bellucci (PhD) is an Assistant Professor in Accounting at the Department of Economics and Management of the University of Florence. His research interests include dialogic accounting, stakeholder engagement, sustainability reporting, corporate social responsibility, social enterprises, and third sector organizations.

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