



**Radboud
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**Corporate sustainability, corporate governance mechanisms
and the choice of firms to comply with sustainability
reporting guidelines**

Master Thesis

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Abstract

This study explores the pressures arising from corporate governance mechanisms and its effect on the compliance with sustainability reporting guidelines for 1056 firms for the time period 2013-2017. A distinction is made between direct effects and indirect effects through corporate sustainability performance. The results show that the sustainability committee and stakeholder engagement positively influence the compliance both directly and through CSP. The board of directors, as a major internal corporate governance mechanism, only positively influences compliance through CSP. The results failed to show that the board of directors influences the compliance. External assurance is positively related to compliance as well, however the results found no evidence supporting that high quality is important in further unraveling the relationship towards compliance. This study posits that in absence of a mandatory sustainability reporting regime, corporate governance mechanisms provide pressure on firms to be held accountable for their actions and decisions regarding sustainability reporting guidelines.

Keywords: Compliance with sustainability reporting guidelines, corporate sustainability performance, corporate governance mechanisms

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1. Introduction

Recent years has put much emphasis on corporate sustainability behavior in both theory and practice. Investors and other stakeholders are increasingly putting pressure on firms to take responsibility for the impacts of their decisions and actions on the environment and the society (Amran, Lee and Devi, 2014; Braam and Peters, 2018; Manning, Braam and Reimsbach, 2018). Due to the absence of regulation it is still voluntary whether firms comply with sustainability reporting guidelines and truthfully present their performance related to sustainability issues (Hahn and Kühnen, 2013; Ioannou and Serafeim, 2017). This implies that the situation arises that there is information asymmetry between managers and other stakeholders (Braam, de Weerd, Hauck and Huijbregts, 2016) and that managers have incentives to behave opportunistically (Brammer and Pavelin, 2006). To reduce the information asymmetry, firms choose to disclose sustainability performance and to comply with sustainability reporting guidelines (Bebbington, Unerman and O'Dwyer, 2014). Furthermore, increasing their CSP and complying to sustainability reporting guidelines, could be a way for firms to deal with the increased pressure on them from both the society and corporate governance mechanisms.

Corporate governance mechanisms, i.e. the board of directors and a sustainability committee, have the power to reduce the information asymmetry due to their capacity to effectively monitor management behavior (Jensen and Meckling, 1976; Jensen and Murphy, 1990). The reduction of the information asymmetry will make sure that the information is more faithfully presented in sustainability reports, leading to an increase in reliability (Brammer and Pavelin, 2006; Hahn and Kühnen). Another important characteristic of corporate governance mechanisms is that they have the power to strategically direct firms to favorable positions/directions (Shleifer and Vishny, 1997). Consequently, these corporate governance mechanisms have the power to make sure that firms take sustainability issues into account, if this is such a favorable direction. Due to the pressure arising from these corporate governance mechanisms and better monitoring of firms, corporate governance mechanisms will influence the corporate sustainability performance (CSP)¹ (Amran et al., 2014; Hussain, Rigoni and Orij, 2018). The CSP is the performance in the

¹ In the literature corporate social performance and corporate sustainability performance are used interchangeably. This paper will use the latter, following previous literature (Braam and Peeters, 2018; Hummel and Schlick, 2016; Hussain et al., 2018; Manning et al., 2018).

environmental, social and economic dimensions related to sustainability issues (Elkington, 1998). There is ambiguity about the term CSP and how it is defined in both the literature and in management (Wood, 1991). Clarkson (1995) argued that CSP is more effectively analyzed and evaluated by using a framework based on the relationship between management and stakeholders. Artiach, Lee, Nelson and Walker (2010) argued that CSP measures the extent to which the firm embraces economic, environmental, social and governance factors into operations and consequently the impact they exercise on the society and firms. However the literature is consistent in stating that CSP is firm specific and therefore it varies between different industries as well. Furthermore, the pressure from stakeholders differs and this leads to different dimensions for firms at which they are held accountable (Krajnc and Glavic, 2005).

Complying with sustainability reporting guidelines is another way for firms to deal with increasing pressures on them. These pressures can be exercised from the society (Hummel and Schlick, 2016), but from corporate governance mechanisms as well (Manning et al., 2018). There has been some research which provides insights into the relationship between corporate governance mechanisms and CSP (Bear, Rahman and Post, 2010; Hussain et al., 2018; Johnson and Greening, 1999; Konrad, Kramer and Erkut, 2008). However, there has not been a lot research towards the relationship between CSP, corporate governance mechanisms and compliance with sustainability reporting guidelines. Therefore, this study aims to gain insight between the direct effects of corporate governance mechanisms on compliance with sustainability reporting guidelines and on the indirect effects through CSP. To reach this aim, this study uses an international panel data set consisting of 1056 firms using 2013-2017 as a five year time-period.

This thesis contributes to the literature between corporate governance, corporate sustainability performance and compliance with sustainability reporting guidelines in several ways. First of all, previous studies focused on compliance with sustainability reporting guidelines as a proxy for a scorecard for the corporate sustainability reporting quality (Amran et al., 2014). Otherwise, compliance was measured as a composite scorecard from different standards (Manning et al., 2018). This paper however uses the specific level of compliance with the Global Reporting Initiative (GRI) guidelines to assess the differences between the level of compliance. Furthermore, there is a need for literature to critically examine the determinants of different

levels of compliance with sustainability reporting guidelines (Amran et al., 2014; Hahn and Kühnen, 2013; Manning et al., 2018). Furthermore, the corporate governance mechanism used in this study, the board of directors, sustainability committee, stakeholder engagement and external assurance have the potential to influence the compliance with sustainability reporting guidelines, however there is not been a lot research towards this possible relationship.

Thirdly, the relationship between the CSP and the compliance with sustainability reporting guidelines can be explained by two opposing theories, legitimacy and signaling theory. Legitimacy theory suggests that firms with inferior CSP will choose to disclose sustainability information to legitimize their firm (Patten, 1992), while signaling theory suggests that firms with superior CSP will disclose sustainability information to distinguish themselves from competitors with inferior CSP (Verrecchia, 1983). Research towards those theories and sustainability issues show inconsistent results. Cho, Lee and Pfeiffer (2013), Patten (1992) and Wilmurst and Frost (2000) found evidence in (partial) support for legitimacy theory, while Mahoney, Thore, Cecil and LaGore (2013) found evidence supporting the signaling theory. Furthermore, research is inconclusive whether both theories are substitutes (Clarkson, Li, Richardson and Vavari, 2011) or complementary (Gray, Kouhy and Lavers, 1995). This study goes even a step further by using these theories to assess the level of compliance with sustainability reporting guidelines to reduce the empirical work with this ambiguity.

This research has practical implications for investors and other stakeholders as well, in understanding whether corporate sustainability performance links directly to compliance and thus whether compliance with the sustainability guidelines is a way of hiding inferior CSP or showing superior CSP. Moreover, the results of this study could have implications for standard makers, by showing them the need for mandatory guidelines is a way to overcome the problems related to voluntary disclosure. Creating awareness for the public puts further pressure on firms to increase their CSP, faithfully report and comply with sustainability reporting guidelines.

This thesis is structured as follows: first, there will be a theoretical framework. In this section, the underlying theories of this research are explained and hypotheses are developed. This is followed by a research design. Then the results of the empirical analysis will be set out and interpreted. Finally, a conclusion and discussion is drawn, which provides limitations and suggestions for future research.

2. Theoretical framework

2.1 Agency theory

Agency theory argues that an agent performs tasks for the principal and the agent receives decision making authority from the principal (Jensen and Meckling, 1976). Both parties will try to maximize their own utility by acting in their self-interest. Since the agent performs tasks for the principal, the principal has less inside information than the agent, meaning there is information asymmetry between both parties. The dispersion between ownership and management is the prime example of the agency problem (Jensen and Murphy, 1990). In this situation, management and shareholders have conflicting interests. Management can behave in their own interest, which is to work with the least amount of effort possible, while the shareholders want a higher return on their shares. In order to mitigate the information asymmetry, managers decide to disclose information (Brammer and Pavelin, 2006). Managers have incentives to report to show investors that they behave optimal (Watson, Shrivies and Marston, 2002). Shareholders also incur monitoring costs as result of controlling management in the pursuit of optimal behavior and reduction of information asymmetry (Jensen and Murphy, 1990). In this process, corporate governance mechanisms play an important role. Corporate governance mechanisms have both the potential to monitor and control management and have an important role in the reporting process (Shleifer and Vishny, 1997). This is true for both financial and sustainability reporting. As mentioned previously, sustainability reporting is still voluntary and managers can choose whether to fully disclose relevant and reliable information (Bebbington et al., 2014).

Research suggests that CSR reporting is a way to decrease information asymmetry as well, due to the informativeness of reporting (Dhaliwal, Li, Tsang and Yang, 2011; Dhaliwal, Radhakrishnan, Tsang and Yang, 2012). However the voluntary nature of sustainability reporting results in a challenge for investors and stakeholders to properly assess the underlying CSP. Compliance with the reporting guidelines provided by Global Reporting Initiative is said to reduce problems with sustainability reporting (Manning et al., 2018). These guidelines are designed to enhance the quality, but it still leaves room for interpretation (Boiral, 2013; Cho et al., 2012).

2.2 Voluntary disclosing theories

Two seemingly opposing theories are prominent in the literature about voluntary disclosing sustainability information; the legitimacy and signaling theory. Signaling theory suggests that firms with superior CSP will disclose their performance to distinct themselves from firms with inferior performance, while legitimacy theory suggests that firms with inferior CSP will disclose their performance to influence the public perceptions about their sustainability performance.

Legitimacy theory predicts that firms with inferior CSP will voluntary disclose sustainability information, to legitimize their actions within the bounds of what society identifies as socially acceptable behavior (An, Davey and Eggleton, 2011; Hummel and Schlick, 2016; O'Donovan, 2002; Wilmshurst and Frost, 2000). The legitimacy of firms is threatened when stakeholders think that the long-term survival of the firm is at risk (Davis, 1973). In other words, *'organizations can only continue to exist if the society in which they are based perceives the organization to be operating a value system that is commensurate with the society's own value system'* (Gray, Owen and Adams, p.28, 2009). Furthermore, the theory suggests that firms will disclose information about their CSP to influence public perceptions about their performance or to inform them about their progress (Lozano and Huisingh, 2011). Consequently, managing expectations and perceptions of investors and stakeholders reduces the negative effect bad CSP has on their legitimacy and reputation (Amran et al., 2014; Branco and Rodrigues, 2008). Lindblom (1994) suggested that firms seek to distract the attention away from issues of concern and divert to attention to more favorable issues. Finally, legitimacy theory focuses on the society as a whole without considering individuals separately (Belal, 2016; Deegan, Rankin and Tobin, 2002; Fernando and Lawrence, 2014).

The purpose of signaling theory is to signal the relevant individuals within the society. Signaling theory predicts that firms with superior CSP will signal their superior CSP to investors and stakeholders to distinguish themselves from firms with inferior CSP (Connelly, Certo, Ireland and Reutzel, 2011; Verrecchia, 1983). These firms distinct themselves from other firms, because their disclosure about their CSP cannot easily be mimicked by firms with inferior CSP (Clarkson, Richardson and Vasvari, 2008). Showing superior CSP has the potential to yield some additional financial advantages (Clarkson et al., 2011). Dhaliwal et al. (2011) and Plumlee, Brown, Hayes and Marshall (2015) found that firms who disclose sustainability information have

lower cost of equity capital. Furthermore, there analysts coverage increases and superior CSP attracts more dedicated investors who consider long-term perspectives more and play monitoring and governance roles. Signaling superior CSP also results in a higher share price (Clarkson et al., 2011). However, the underlying CSP of firms has to be stem with the signal, because otherwise the signal is not effective and does not faithfully represent the CSP of the firm (Morris, 1987).

Both theories have opposing views on which firms comply with sustainability reporting guidelines. However, to comply with these guidelines is a costly process (Leitoniene and Sapkauskiene, 2015). This implies that the advantages of complying must outweigh the costs, otherwise there is no point in complying. If firms with inferior CSP comply with sustainability reporting guidelines it is difficult for firms to mask their inferior CSP (Cho and Patten, 2007). Therefore the advantages will not outweigh the costs for firms with inferior CSP and therefore these firms are less likely to comply (Cho and Patten, 2007). However, for firms with superior CSP the intend of complying is to increase the reliability of their reports. This means that their CSP is indeed superior and this is faithfully represented in their reports (Hahn and Kühnen, 2013).

H1: Firms with superior CSP are more likely to comply with GRI guidelines than firms with superior CSP.

2.3 Corporate governance mechanisms

2.3.1 The board of directors

The board of directors is generally seen as the lynchpin of corporate governance (Gillan, 2006). With an obligation to the shareholders of firms, the board of directors is responsible for providing management with strategic directions and monitoring. First of all, better monitoring reduces the information asymmetry between the principal and the agent and it makes sure that the interests of both parties are more aligned (Jensen and Meckling, 1976). The board of directors is also responsible for monitoring of the sustainability reporting process. This means that the board can put pressure on management to increase the CSP and to comply with sustainability reporting guidelines (Amran et al., 2014). Monitoring the activities and decisions management makes about sustainability issues is another tool for the board of directors to increase these two concepts (Manning et al., 2018). In the extant literature, board strength is

mostly composed of characteristics such as CEO duality, gender diversity and the board's independence (Hussain et al., 2018). The board characteristics gender diversity, the board independence and CEO duality are turned into a composite board strength measure, which accounts for both the effectiveness of monitoring and whether they take sustainability issues into account.

First of all, diversity in general improves the possibility that different perspectives and ideas are taken into account, which holds for gender diversity as well. The differences perspectives and ideas come forth from differences in men and women traditionally, socially and culturally (Feingold, 1994). These differences ensures that women are generally more concerned than men with environmental issues (Diamantopoulous, Schlegelmilch, Sinkovics and Bohlen, 2003; Mainieri, Barnett, Valdero, Unipan and Oskamp, 1997). Fernandez-Feijoo, Romero and Ruiz (2012) showed that boards with more women lead to more sustainability disclosure, because the values associated to women are reproduced in social practices. Boards with a minimum of three female boards members have a higher quality of reporting information (Bear et al., 2010; Fernandez-Feijoo et al., 2012). The more diverse the board of directors then is, the greater the chance sustainability issues are taken into account. Women are less self-oriented as well, which strengthens the board monitoring effectiveness, since they take the interests of stakeholders in account (Coffey and Wang, 1998; Liao, Luo and Tang, 2015). Erhardt, Werbel and Shrader (2003) and Carter, Simkins and Simpson (2003) both found that firms with gender diverse boards outperform firms which are not. Adams and Fereira (2009) found that firms with more gender diversity have superior CSP over their competitors. Women have different ethical perceptions than men do and therefore stakeholders value firms with a gender diverse boards as an indicator for socially oriented firm (Liao et al., 2015). Williams (2003) argued that firms with a more gender diverse board put more emphasis on sustainability issues.

Secondly, a greater number of independent board members is associated with better board effectiveness. The independent directors can monitor management more effectively, because they are not directly involved with day-to-day operations (Liao et al., 2015). They do not have an official position in the firm either, which means that they do not have a material financial interest in the firm (Harjoto and Jo, 2011). Consequently, the independent board members provide more objective feedback about the firm's performance opposed to non-independent board members.

The Chief Executive Officer (CEO) has less power over the board members as well, because the careers of the independent directors are independent of influence from the CEO (Core, Holthausen and Larcker, 1999). Coffey and Wang (1998) argued that dependent directors are more occupied with achieving short-term financial goals, which is quite a narrow view of the entire organizational performance (Johnson and Greening, 1999). Independent directors take a broader view of firm organizational performance, which focuses not primarily on short-term financial goals, benefits and measures. This leads to the notion that independent directors tend to look beyond the interest of shareholders² and executives and thus focus on sustainability development as well (Johnson and Greening, 1999). Due to diverse backgrounds and not having financial interests in firms, independent directors are more stakeholder-oriented (Liao et al., 2015). Their orientation is towards the different stakeholders resulting in a greater ability to include the interest from a variety of stakeholders and not just the interests of shareholders and (executive) management (Abdullah, Mohamad and Mokhtar, 2011). The independence of the board directors is the mediating role in dealing with different stakeholders, which results in the promotion for more sustainable policies (Haniffa and Cooke, 2005; Liao et al., 2015).

Lastly, CEO duality has been frequently researched into the paradigm of the relation with sustainability issues (Hussain et al., 2018). CEO duality means that the CEO also holds a position as a board's chairman. Both roles are thus assigned to a single person resulting in weak monitoring (Rechner and Dalton, 1991). The acknowledgement that board independence is both preferable for taking sustainability issues into account and for board monitoring is of importance for the CEO duality as well; CEO duality decreases the independence of the board (Michelon and Parbonetti, 2012). Without CEO duality, the CEO does not have influence on the board of directors and the board faces less internal pressures without CEO duality (Hussain et al, 2018). When the CEO is the chair of the board, the CEO might withhold important sustainability information and might be reluctant to engage in sustainability actions and decisions if it is not aligned with its own interests (Liao, Lin and Zhang, 2018). Following the underlying theory and the managerial rationale³, CEO duality is negatively related to the board of directors strength.

² These interests are the short-term financial performance (Jensen and Meckling, 1976).

³ The managerial rationale states that separation is advisable (Gregg, 2009).

These three characteristics are developed into a composite measure of board strength (Dhaliwal, Naiker and Navissi, 2006; Hoitash, Hoitash and Bedard, 2009). Higher strength of the board of directors results in better monitoring in the first place. But, increasing the strength of the board of directors also ensures that sustainability issues are taken in consideration and that firms take responsibility for their actions and decisions regarding sustainability issues. This could lead to firms complying. Complying with sustainability reporting guidelines may also increase the monitoring effectiveness (Manning et al., 2018). This results therein that information asymmetry is reduced and monitoring costs decrease (Dhaliwal et al., 2012; Manning et al., 2018).

Increasing the board strength also increases the incentives for firms to increase the compliance to truthfully report the (improved) CSP and to differentiate themselves from other firms (Manning et al., 2018). However, firms with inferior CSP could also choose to comply to react to legitimacy threats instead of improving their CSP. However this opportunistic use of inferior firms is mitigated by board monitoring, which means that it will be harder to hide inferior CSP (Manning et al., 2018). Thus the compliance with sustainability reporting guidelines can also be indirect via higher CSP⁴.

Therefore the hypotheses are:

H2a: The board strength is positively related to the compliance with sustainability reporting guidelines.

H2b: The board strength is positively related to the compliance with sustainability reporting guidelines through CSP.

2.3.2 Sustainability committee

The literature recognizes that the existence of a board member with sustainability expertise should influence both CSP and the compliance with the sustainability reporting guidelines (Hahn and Kühnen, 2013). However more importantly is the existence of a sustainability committee inside organizations (Amran et al., 2014). A sustainability committee is a committee inside the board of directors, just as the audit committee (Eberhardt-Toth, 2016). The existence of a sustainability committee is a resource for firms to gain a competitive advantage against their

⁴ The effect that higher CSP is related to compliance, is hypothesized in section 2.2. Further explanation about this relationship can be found in this section.

competitors. In dealing with outside pressures, stakeholders can make sure via the sustainability committee that actions and decisions regarding sustainability issues are being made (Dilling, 2010). This implies that firms are also designating sustainability committees to deal with these pressures. Due to problems with the CSP and the compliance with sustainability reporting guidelines, board monitoring is important to assess these issues⁵ and to monitor sustainability operations (Gregg, 2009). Sustainability committee has the aim to plan, implement and review sustainability policies and activities (Liao et al., 2015). Another purpose of the sustainability committee is to enhance the awareness of employees and management about their sustainability responsibilities to prevent negative outcomes and consequences. They have the power to create (non) monetary incentives to improve the actions and decisions on sustainability issues (Liao et al., 2015). The underlying mechanism for the indirect effect of the sustainability committee on compliance is similar to that of the board of directors. Firms with a sustainability committee will increase the compliance to truthfully report their (improved) CSP to differentiate them for other firms (Manning et al., 2018). Firms will also try the opportunistic use of complying, by simply complying by masking their CSP (Manning et al., 2018). However the sustainability committee is providing enough pressure on management (Liao et al., 2015) and it is enough involved with the actions and decisions of management (Gregg, 2009), that this opportunistic use is not likely to occur. Based on these underlying theories, the hypotheses are:

H3a: Sustainability committee is positively related with sustainability reporting guidelines.

H3b: Sustainability committee is positively related with sustainability reporting guidelines through CSP.

2.3.3 Stakeholder Engagement

Just as firms face internal pressures, i.e. the board of directors and a sustainability committee, firms face external pressures as well (Manning et al., 2018). This paper recognizes stakeholder engagement as the most important external corporate governance mechanism. Stakeholders increasingly put pressure on management to take responsibility for the impact of the actions and decisions on the environment and the society (Amran et al., 2014; Braam and Peeters, 2018; Manning et al., 2018). In this realm, firms are ought to manage the different stakeholders

⁵ Further explanation can be found in the section about the board of directors.

interests and engage with them (Manetti, 2011). Stakeholder engagement can be defined as ‘*the process used by the organization to engage relevant stakeholders for a clear purpose to achieve agreed outcomes. It is also recognized as a fundamental accountability mechanism since it obliges an organization to involve stakeholders in identifying, understanding and responding to sustainability issues and concerns, and to report, explain and answer to stakeholders for decisions, actions and performance*’ (AccountAbility 1000, p.34, 2015). It therefore includes the firms strategy and operations. Improving strategy and helping to identify the operations are critical purposes from the stakeholder perspective in the engagement. Stakeholder engagement is a way for firms to better understand what the stakeholder wants and therefore how it affects the firms goals (Donaldson and Preston, 1995). The task for the firm is then to balance the different interests and it faces a choice about which choices and actions to undertake (Manetti, 2011). Furthermore, they can improve their communication and rethink their strategies and operations and have long-term benefits such as brand reputation or first mover advantage (Freeman, Harrison, Wicks, Parmar and De Colle, 2010). When stakeholders put more pressure on firms, firms will act more accordingly towards sustainability issues (Andriof and Waddock, 2017). Following this underlying theory, the engagement of stakeholders will make sure that more sustainability issues are taken in account.

As a reaction to the pressure stakeholders put on firms, firms will increase their CSP. Just as the board of directors and the sustainability committee, opportunistic use of complying as a way of hiding inferior/bad CSP is not likely to happen, because this is likely to be prevented by the engaged stakeholders (Manning et al., 2018). The engagement of stakeholders and the pressure they exercise also results that the information asymmetry is reduced, because the reports are now more credible and faithfully represented (Manning et al., 2018). The pressure arising from key stakeholders will also affect the decision of firms to comply with sustainability reporting guidelines (GRI report, 2013). The engagement of key stakeholders with firm sustainability decisions also has the potential the make sure that firms comply with sustainability reporting guidelines. Following the underlying theory, the hypotheses are:

H4a: Stakeholder engagement is directly positively related to compliance with sustainability reporting guidelines.

H4b: Stakeholder Engagement is positively related to compliance with sustainability reporting guidelines through CSP.

2.3.4 External Assurance

External assurance is said to enhance the credibility and reliability of sustainability reports (Braam and Peeters, 2018). The increase of the credibility of reports by third parties comes is caused by more experience, better qualities and integrity (Becker, DeFond, Jiambalvo, Subramanyam, 1998). Therefore it increases the corporate reputation as well (Simnett, Vanstraelen and Chua, 2009). Since there is increasing pressure on firms to take responsibility for their actions on sustainability issues and to provide credible reports about these issues, external assurance is a way to deal with these pressures. Another reason for issuing external assurance is to improve stakeholder engagement because firms use their sustainability reporting process as the basis for an on-going dialogue with their stakeholders (GRI report, 2013). Braam and Peeters (2018) found that the high quality assurance reports influence decisions about sustainability issues as well. This high quality assurance ensures that firms can differentiate themselves from other firms. Accordingly, the high quality external assurance further enhances the credibility and the reliability of the sustainability reports (Gürtürk and Hahn, 2016). Firms which choose to issue high quality external assurance comply to sustainability reporting guidelines, because this is what these high quality external assurance are meant to do. Furthermore, high quality external assurance is a very costly process and when firms are not compliant the advantages do not outweigh these costs.

Therefore, the hypotheses are:

H5a: Firms which external assure their sustainability reports are more likely to comply than firms which do not.

H5b: Firms with high quality external assurance are more likely to comply than firms which do not.

3. Research Design

3.1 Sample

To test the hypotheses, panel data is used on a set of 1056 firms covering a 5 year time-period from 2013-2017 consisting of firms that disclosed their sustainability reports⁶. This time-period provides the most complete dataset for this research. Posterior data is not yet processed by the GRI database, while previous data is unavailable for many firms. This database provides information about firm characteristics regarding the sustainability issues. The compliance with the sustainability reporting guidelines and external assurance are among those sources in this database. Thomson Reuters' Asset4 is used for the financial information of the firms. This includes the information about the other independent variables and all the control variables. Finally, data from both these databases are merged into a single complete dataset.

From the initial sample of 5280 observations, 14 observations are excluded from the model due to missing values of the compliance variables. Additionally, 623 observations are excluded due to missing values on CSP. Finally, 160 observations are excluded due to missing values on one of the other variables. Table 1 presents the sample selection. The sample distribution can be found in Appendix A. This sample distribution shows that Japan is the most represented country, closely followed by the USA and the UK. The following industries are represented in this study: industrial, utility, transportation, bank/savings/loan, insurance and other financial. The industrial industry is the most represented in this study. The total sample distribution of countries and industries can be found in Appendix A.

Table 1: Sample selection

1056 firms with sustainability reports from the period 2013-2017	5280
Less: observations with missing values on Compliance	-16
Less: observations with missing values on CSP	-623
Less: observations with missing values on other variables	-160
Final sample	4483

⁶This study recognizes that firms either issue a stand-alone sustainability report, or disclose sustainability information into their financial report (integrated report). For this research, there is no need to make a distinction and therefore this study uses: *sustainability reports*.

3.2 Variable measurement

3.2.1 Independent variables

3.2.1.1 Compliance with sustainability reporting guidelines

To access compliance with sustainability reporting guidelines, a dummy variable is used based on a measure extracted from the GRI database. The GRI guidelines have some key reporting principles towards creating a balanced report on environmental, social and economic issues (GRI, 2019). The GRI guidelines help businesses, governments and other organizations to understand and communicate the impact of business activities on critical sustainability issues as well (GRI, 2019). The GRI framework also improves the usefulness and understandability for both investors and stakeholders (Rezaee and Tuo, 2017). The measure of GRI consists of three levels. Level 3 suggests that firms disclose sustainability reports in accordance with the GRI guidelines, which GRI code as G1, G2, G3 and G4. Level 2 suggests that firms only reference the GRI guidelines and thus not adopt the guidelines. Level 1 suggests that firms in their sustainability report do not follow the GRI guidelines. By ascending from level 1 to level 3, firms become more compliant. Each category is captured into one dummy, ranking from least compliant to most compliant. Table 2 summarizes the compliance with sustainability reporting guidelines. In this study's sample, almost two out of three firms comply with these guidelines.

Table 2: Compliance with sustainability reporting guidelines

Compliance		Freq.	Percent	Cum.
	0	1009	22.51	22.51
	1	532	11.87	34.37
	2	2942	65.63	100.00
Total		4483	100	100

3.2.1.2 CSP

To access the CSP of firms, the ESG score is retrieved from Thomson Reuters Asset 4 of the environmental and social dimension, as is consistent with Braam and Peeters (2018) and Liao et al. (2015). Then the mean of these dimensions is taken to reach a score for CSP, which ranges from 0 to 100. Since sustainability as a whole consists of different dimensions (Elkington, 1998;

GRI report, 2019), including scores from different dimensions increases the validity of this research.

The ESG score of the social dimension is described as follows: “The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of 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” (Asset4, 2019). This ESG score is a complicated score consisting of lots of different indicators in the social dimension. It is about the way firms deal with their employees, but also how it deals with the society’s values and norms and the responsibility it has for the society. The social ESG score has the following the categories: workforce, human rights, community and product responsibility (Thomson Reuters, 2019).

The ESG score of the environmental dimension is described as follows: “The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value” (Assets4, 2019). The ESG score is a complicated score as well. The environmental ESG score consists of many indicators in the following categories: resource use, emissions and innovation (Thomson Reuters, 2019).

3.2.2 Dependent variables

To test the hypotheses, different firm specific measures are used. The strength of the board of directions is measured by taking the three characteristics and then creating a single measure. First of all, the CEO duality is measured by a dummy variable with value 1 if the firms has no CEO duality and 0 otherwise (Hussain et al., 2018). The gender diversity is measured by dividing the amount of female directors by the amount of total directors (Amran et al., 2014; Liao et al., 2015). The independence of the board is measured by the amount of non-executive directors divided by the total amount of directors (Joseph and Taplin, 2011; Hussain et al., 2018). The next step towards the board strength variable is to take the median from both gender diversity and independence. Then for each variable a dummy variable is created with value 1 if the firm has a value equal or higher then this median and 0 otherwise. The dummy variables are a prerequisite for constructing a new variable for the board strength. The final step in

constructing this variable for the board strength, is to take the sum of the three dummies (Dhaliwal et al., 2006; Hoitash et al., 2009; Manning et al., 2018). The board characteristics are retrieved from Thomson Reuters' Asset 4. Table 3 summarizes all the board related variables.

Table 3: Board of directors measurement

Indicator	Definition
Independence	The amount of non-executive members divided by the total board members.
Gender diversity	The amount of female directors divided by total directors.
CEO duality	A dummy variable with value 1 if there is no CEO duality and 0 otherwise.
Board Strength	The board strength is computed by the independence, gender diversity and CEO duality. A measure is created with the summed up dummy variables of each variable. Further explanation is provided in section 3.2.2.

To measure the sustainability committee, a dummy variable is created with value 1 if the firm has a sustainability committee and 0 otherwise (Liao et al., 2015). The stakeholder engagement is a dummy variable with value 1 if firms have stakeholder engagement and 0 otherwise. The information of both these independent variables is retrieved from Thomson Reuters' Asset 4 database. Whether firms issue external assurance on their sustainability reports is captured in a dummy variable with value 1 if firms have external assurance and 0 otherwise. Then the components of high quality external assurance are measured with different dummies. These different components are the scope of the external assurance, the provider of external assurance and the level of the external assurance (Braam and Peeters, 2018). First of all, firms that have their entire sustainability report assured have dummy variable 1 and 0 otherwise. Secondly, firms with a provider from the auditing profession have a dummy with value 1 and 0 otherwise. Finally, the level of external assurance has value 1 when firms have reasonable external assurance and 0 otherwise. The information needed for all the external assurance independent variables are retrieved from the GRI database.

3.2.3 Control variables

Several control variables are included as well as random effects at both the industry and firm level to control for specific firm and industry effects. A year dummy is included to control for time effects and an industry dummy to control for industry specific effects.

A control variable at the firm level is the firm size (SIZE), which is measured by natural logarithm of assets, following previous literature (Braam et al., 2016; Clarkson et al., 2011; Hahn and Kühnen, 2013; Michelon, Pilonato and Ricceri, 2015). Hickman (2018) found that there is more pressure from the public on larger firms than smaller firms regarding sustainability issues. Therefore a positive relationship is expected. Other control variables are financial performance measured by return on assets (ROA) and leverage (LEV) measured by dividing total assets with total liabilities. Both these variables are winsorized at 1% to omit potential influential outliers. The higher the financial performance (ROA) of firms, the more likely it is these firms comply. They have more money available to comply, since it is a costly process (Leitoniene and Sapkauskiene, 2015). Casey and Grenier (2014) found that highly levered firms have to potential to prevent extensive sustainability disclosures. Therefore leverage has the potential to negatively influence the compliance as well. Another control variable is analysts coverage, following previous literature (Hahn and Kühnen, 2013; Rezaee and Tuo, 2017). Analysts closely follow firms and if firms do not comply or will try to mask their inferior CSP, the presence of analysts coverage will increase the chance that this will be noticed (Jo and Harjoto, 2011). The presence of analysts will also make sure that firms and the stakeholders are more aligned with each other, because it will be harder for management to pursue their own interests. This alignment makes that more sustainability issues are taken into account (Jo and Harjoto, 2014). The median is taken from this variable and then a dummy variable is created with value 1 if a firm is above median and 0 otherwise. The final control variable is the listing status of firms. A dummy variable with value 1 if a firm is listed and 0 otherwise. Agency problems are more likely to occur when there is a clear dispersion between ownership and management, which comes forth with listed firms (Jensen and Meckling, 1976). Therefore investors of firms put more pressure on firms to comply with sustainability reporting guidelines when firms are listed. Hickman (2018) found that firms that are listed are more likely to comply with sustainability reporting guidelines. Thus a positive relationship with compliance is expected. All the variables are summarized in Table 4.

3.3 Analysis

To test the hypothesis, panel data is used because it is able to capture the cross-sectional differences between firms while including time-series. Panel data also captures the differences within firms over time (Hsaio, 2014; Studenmund, 2014). To test the hypotheses, which incorporates the direct effects from corporate governance mechanisms on compliance the following model is used:

$$COMPLIANCE_{i,t} = \beta_0 + \beta_1 CSP_{i,t} + \beta_2 STENG_{i,t} + \beta_3 BOARD_{i,t} + \beta_4 CSR_{COM}_{i,t} + \beta_5 EXA_{i,t} + \beta_6 SCOPE_{i,t} + \beta_7 TYPE_{i,t} + \beta_8 LEVEL_{i,t} + \beta_9 SIZE_{i,t} + \beta_{10} ROA_{i,t} + \beta_{11} ANALYSTS_{i,t} + \beta_{12} LEV_{i,t} + \beta_{13} Listing_{i,t} + \beta_{14} INDUSTRY_i + \beta_{15} YEAR_t + \varepsilon_i$$

In this model, a mixed-effects ordered logistics regression is run, since the dependent variable is a rank dummy with values 0,1 and 2⁷. In the next model, a normal panel data regression is run.

To test the relationship between corporate governance mechanism and compliance through CSP, the following econometric model is used:

$$CSP_{i,t} = \beta_0 + \beta_1 BOARD_{i,t} + \beta_2 STENG_{i,t} + \beta_3 EXA_{i,t} + \beta_4 CSR_{COM}_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 ANALYST_{i,t} + \beta_8 LEV_{i,t} + \beta_9 Listing_{i,t} + \beta_{10} INDUSTRY_i + \beta_{11} YEAR_t + \varepsilon_i$$

Table 4: Variable Measurement

Indicator	Definition
Compliance	The compliance with Global Reporting Initiative guidelines. A dummy variable is created with value 2 if firms sustainability reports are in accordance with the guidelines, value 1 if in the sustainability report the guidelines are cited and value 0 if the sustainability reports do not follow the guidelines.
CSP	The corporate sustainability performance. This is measured by taking the mean of the environmental and social dimension's ESG score.
Independence	The amount of non-executive members divided by the total board members.
Gender diversity	The amount of female directors divided by total directors.

⁷ Further explanation about this dummy is provided in section 3.2.1.1.

CEO duality	A dummy variable with value 1 if the CEO does not have a position in the board and 0 otherwise.
Board Strength	The board strength is computed by independence, gender diversity and CEO duality. A measure is created by taking the mean of these four variables. Further explanation is provided in section 3.2.2.
External Assurance	A dummy variable is created with value 1 if a firm has external assurance and 0 otherwise.
TYPE	A dummy variable is created with value 1 if the external assurance is done by firm from the accounting profession and 0 otherwise.
Scope	A dummy variable is created with value 1 if the entire sustainability report is assured and 0 otherwise.
Level	A dummy variable is created with value 1 if a firm has reasonable assurance over their reports and 0 otherwise.
STENG	Stakeholder engagement with value 1 if a firm has stakeholder engagement and 0 otherwise.
Industry	A dummy variable is created for the different industries.
Year	A dummy variable is created for each year
SIZE	The size of the firms are measured by the natural logarithm of assets.
ROA	The return on assets to measure the firm performance.
LEV	The leverage of firms, which is measured by dividing total assets with total liabilities.
Analysts	A dummy variable is created with value 1 if the number of analysts following the firm is above the median and 0 otherwise.
Listing	A dummy variable is created with value 1 if the firm is listed and 0 otherwise.

4. Results

4.1 Descriptive statistics

The thing that stands out most from the descriptive statistics is the difference between the amount of observations. In the regression models the amount of observations is 4483. However the model which incorporates the high quality assurance independent variables has significantly less observations. This stems from the prerequisite that the observations for high quality assurance are only present when firms have external assurance. Consequently, only 1766 firms out of 4483 have external assurance. Another important thing to note is that the mean of CSP is reasonably high, namely 77 out of a 100. Looking at the means of the other dependent variables, the board of directors, sustainability committee and stakeholder engagement are above the mean of the dummy variables⁸. This means that in the sample, firms have relatively high board strength. Furthermore, relatively more firms have sustainability committees and stakeholder engagement than firms which do not. Less than half of firms in the sample have external assurance, confirming theories that external assurance is a costly process by which the advantages and benefits of external assurance have to outweigh the costs (Braam and Peeters, 2018; Fonseca, 2010; Verrecchia, 1983).

Table 5: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
COMPLIANCE	4483	1.431184	.8340051	0	2
CSP	4483	77.26303	20.534	7.07	96.075
BOARD	4483	1.69797	.9126328	0	3
CSRCOM	4483	.8168637	.3868214	0	1
STENG	4483	.7260763	.4460201	0	1
External Assurance	4483	.3975017	.4894359	0	1
TYPE	1766	.6812005	.4661431	0	1
LEVEL	1766	.0770345	.2664756	0	1
SCOPE	1766	.4051627	.4910613	0	1
ANALYSTS	4483	.5460629	.4979292	0	1
SIZE	4483	17.96185	2.765988	105.856	268.027
ROA	4483	5.22224	6.404545	-18.21	27.8
LEV	4483	39.51452	2.277093	0	97.29
Listing	4483	.9466875	.224681	0	1
INDUSTRY	4483	1.75106	1.427731	1	6

⁸ For the board of directors, the average is 1.5. For the sustainability committee and stakeholder engagement the average is 0.5.

Table 6 shows the summary statistics per compliance level. The statistics clearly show that most firms comply with sustainability reporting guidelines, namely 2943 out of 4483. A first look at the statistics shows that firms in compliance level 3 have higher values for all independent variables compared to the other panels with lesser f compliance. However, level 2 of compliance, GRI referencing, has a lower value of the board directors than compliance level 1. Which could be a first sign of not finding significant relationships in support of the hypotheses related to the board of directors.

CSP is increasing when moving from compliance level 1 to compliance level 3. A preliminary view at these statistics is that relative more firms with high CSP comply with sustainability reporting guidelines, supporting the signaling theory (Clarkson et al., 2011; Verrecchia, 1983). Another thing to note is that hardly any firms in compliance levels 1 and 2 issue external assurance, which consequently leads to fewer observations regarding the high quality assurance.

Table 6: Summary statistics per compliance level

Variable	Compliance level					
	1		2		3	
	Obs	Mean	Obs	Mean	Obs	Mean
CSP	1009	67.27139	532	74.79669	2942	81.13579
BOARD	1009	1.653122	532	1.533835	2942	1.743032
CSRCOM	1009	.6878097	532	.8233083	2942	.8599592
STENG	1009	.4519326	532	.5902256	2942	.8446635
External Assurance	1009	.0079286	532	.037594	2942	.5961931
TYPE	8	.75	20	.85	1738	.6789413
LEVEL	8	0	20	.1	1738	.0770108
SCOPE	8	.125	20	.2	1738	.4087799
ANALYSTS	1009	.4103072	532	.481203	2942	.6043508
SIZE	1009	16.7598	532	1.858948	2942	18.26062
ROA	1009	6.096838	532	4.501184	2942	5.052672
LEV	1009	36.55725	532	38.15276	2942	40.775
listing	1009	.9415263	532	.9454887	2942	.9486744
INDUSTRY	1009	1.91774	532	1.597744	2942	1.721618

4.2 Assumption testing

To test for multicollinearity, the Pearson multicorrelation test has been run. These coefficients are presented in Table 7. All the values of the coefficients are between the -0,8 and 0,8, which means there are no problematic high values of multicollinearity between the variables (Hsaio,

2014). The highest coefficients are between external assurance and compliance and between the sustainability committee and CSP. This is explained through the mechanism that external assurance explains the compliance with sustainability reporting guidelines for a significant amount. Both mechanisms are used to decrease agency costs and as a way to deal with outside pressure (Amran et al., 2014; Braam and Peeters, 2018; Manning et al., 2018). The relatively high amount between sustainability committee and the CSP can be explained that firms with high CSP have sustainability committees and firms which introduce a sustainability committee tend to get higher CSP.

Table 7: Pearson correlations

	1	2	3	4	5	6	7	
1. COMPLIANCE	1.000							
2. CSP	0.2891	1.000						
3. BOARD	0.0555	0.1538	1.000					
4. CSRCOM	0.1825	0.4601	0.0400	1.000				
5. STENG	0.3741	0.3960	0.1613	0.3403	1.000			
6. External Assurance	0.5316	0.2927	0.0740	0.1842	0.2995	1.000		
7. TYPE	-0.0353	0.0275	0.1974	-0.0540	0.0021	.	1.000	
8. SCOPE	0.0614	0.0379	-0.0440	-0.0948	0.0098	.	-0.1733	
9. LEVEL	0.0054	0.0072	-0.0079	0.0228	-0.0051	.	-0.0763	
10. LEV	0.0819	0.0737	0.0961	0.0096	0.0778	0.0933	0.0813	
11. ROA	-0.0635	-0.0092	0.0353	0.0045	0.0290	-0.0585	0.0298	
12. SIZE	0.1876	0.1901	-0.2371	0.0692	0.0790	0.1742	-0.1843	
13. ANALYSTS	0.1585	0.3380	0.1469	0.1490	0.1546	0.1587	-0.0414	
14. listing	-0.0069	0.1562	0.0374	0.0779	0.0780	0.0532	-0.0325	
15. INDUSTRY	-0.0597	-0.1498	0.0660	-0.0722	0.0068	-0.0001	0.0638	
	8	9	10	11	12	13	14	15
8. SCOPE	1.000							
9. LEVEL	0.0935	1.000						
10. LEV	0.0091	0.0011	1.000					
11. ROA	-0.0284	-0.0415	-0.2417	1.000				
12. SIZE	0.0859	-0.0462	0.2020	-0.1151	1.000			
13. ANALYSTS	-0.0069	-0.0191	0.0976	-0.0115	0.2108	1.000		
14. Listing	-0.0176	-0.0116	0.0147	-0.0444	0.0301	0.0669	1.000	
15. INDUSTRY	-0.0023	-0.0129	0.2011	-0.0655	0.1729	-0.0258	0.0017	1.000

Furthermore, a variance inflation factors test is run to test for multicollinearity again. Table 6 summarizes the results of the vif test. The vif value of SIZE is 20.00, which is considerably

above the threshold of 10.00 (Hsaio, 2014). Therefore, in all the following analyses, the variable SIZE is omitted from the regressions. The value of listing is higher than 10.00 as well, however when omitting size this variable decreases to below this threshold⁹. Therefore, in all the models listing is included as a control variable. The Hausmann has been done to show whether a random or fixed effects model panel data regression had to be run. The results of the Hausmann test of the panel data regression (Table 9, Model 1) were that the fixed-effects model had to be used. However, the dummy variable of industry is a time-invariant variable and thus a random-effects model is used (Studenmund, 2014). The panel data regression is also been tested for heteroscedasticity. The result showed that there was in fact heteroscedasticity. To correct for this problem, the panel data regression is clustered at firm level.

Table 8: VIF test

Variable	VIF	1/VIF	
BOARD	4.51	0.221656	
CSR COM	6.26	0.159675	
STENG	4.59	0.218081	
External Assurance	1.89	0.528857	
LEV	5.03	0.198664	
ROA	1.80	0.556680	
SIZE	20.00	0.049989	
ANALYSTS	2.44	0.410072	
listing	15.53	0.064393	
INDUSTRY			
	2	1.22	0.821744
	3	1.08	0.925869
	4	1.29	0.772637
	5	1.09	0.918799
	6	1.09	0.914679
Mean VIF	4.84		

4.3 Regression results

Table 9 shows the results of different models used to test H1-H5. Model 1 uses CSP as the dependent variable and tests the relationships between CSP and several corporate governance mechanisms. Model 1 shows that the board strength, sustainability committee and stakeholder engagement are positively significantly related to CSP. Since CSP is a score from 0-100 and

⁹ The results of the new vif test can be found in Appendix B.

some corporate governance mechanisms are dummy variables, the coefficients are quite high. Stakeholder engagement for example has the highest coefficient. However this coefficient can be interpreted when a firm has or introduces stakeholder engagement, the CSP increases by 11.93. When firms have a sustainability committee the CSP increases by a large amount as well, namely 8.539.

Model 2 is a multilevel ordered logistic regression, due to the rank dummy as the dependent variable. Model 2 shows that CSP is positively significantly related to compliance with sustainability reporting guidelines. This in support hypothesis 1, that firms with superior CSP are more likely to comply with sustainability reporting guidelines. The results also support that several corporate governance mechanisms are related to compliance through CSP, since the results in model 1 established that these corporate governance mechanisms had positive significant relations with CSP. In concrete terms, the board strength, sustainability committee and stakeholder engagement are positively related with compliance through CSP. The results thus provide support for H2b, H3b and H4b respectively. Model 2 also shows the direct effects between the corporate governance mechanisms and compliance. The sustainability committee, stakeholder engagement and external assurance are positively significant related to compliance. Therefore it supports H3a, H4a and H5a respectively. As for the independent variables, the board of directors does not show a significant relationship with compliance. Therefore, the model does not support H2a.

Model 3 is the same multilevel ordered logistic regressions as model 2. However it incorporates the high quality external assurance variables as independent variables. Model 3 shows not a single significant relationship between any variable and compliance. The expectation of H5b was that high quality external assurance is positively related to compliance. The results show for all three high quality assurance variables a negative non-significant relationship with compliance. Therefore the results do not provide support for hypothesis 5b. This model is run separately for several reasons. First of all, this model does not yield significant relationships between any variables and compliance. Secondly, in several occasions the relationship between the independent variables and control variables were hypothesized as positive, but the results showed negative relationships. The final reason for running this regression separately is because of the tremendous loss of number of observations, namely from 4483 to 1764.

Table 9: Panel data regression

Model:	(1)	(2)	(3)
	CSP	COMPLIANCE	COMPLIANCE
CSP		0.00958*** (0.003)	0.00677 (0.017)
BOARD	1.558*** (0.316)	0.0145 (0.062)	0.268 (0.300)
CSR COM	8.539*** (1.206)	0.377*** (0.128)	-0.472 (1.183)
STENG	11.93*** (0.849)	1.321*** (0.103)	0.909 (0.589)
External Assurance	1.064** (0.477)	4.428*** (0.211)	
LEV	0.0429** (0.019)	-0.00295 (0.002)	-0.00191 (0.011)
ROA	0.0117 (0.037)	-0.0155** (0.007)	-0.0337 (0.040)
ANALYSTS	3.219*** (0.691)	0.226** (0.103)	0.0829 (0.514)
Listing	10.14*** (2.830)	0.0811 (0.199)	-0.393 (1.124)
Industry ^a	Y	Y	Y
Year ^a	Y	Y	Y
Type			-0.896 (0.549)
Level			-0.791 (0.853)
Scope			-0.0605 (0.617)
Observations	4483	4483	1764

*Statistical significance at 10% level

** Statistical significance at 5% level

*** Statistical significance at 1% level

^a Results of Year and Industry dummies are not depicted due to parsimony (following Manning et al., 2018).

4.4 Robustness checks

To control for measurement errors in the variables, this study conducts several robustness checks. In Table 10 model 4, a principal component analysis has been done to construct a measure which includes not only the GRI guidelines, but five other sustainability reporting guidelines as well. These other guidelines are: United Nations Global Compact (UNGC), Organization for Economic Corporation and Development (OECD), Carbon Disclosure Project

(CDP), Internal Finance Cooperation (IFC) and International Organization for Standardization (ISO). The reasons for conducting the principal component analysis are that it is likely that there is interrelatedness between the different guidelines and each of these guidelines are based on almost similar principles as well (Manning et al., 2018). The new dependent variable for compliance is now a value instead of the rank dummy, which is used in the main analysis. The results are depicted in table 9 in model 4. CSP, stakeholder engagement and external assurance show positive significant relationships with compliance, consistent with the main analysis. However in this model, the board of directors is positively significantly related to compliance as opposed to the main analysis. Therefore with this robustness check, the hypothesis that board of directors positively influences compliance can be accepted. The difference in the results is created by incorporating the different guidelines. Furthermore, the sustainability committee is in this model not positively significantly related to compliance, which means hypothesis 3b is not accepted. This is contrary to the results in the main analysis.

Model 5 uses yet another measurement for the GRI guidelines. In the main model, a rank dummy is used. In model 5, a dummy variable is created with value 1 if a firm discloses a sustainability report in accordance with GRI guidelines and 0 otherwise. Therefore, the citing reference category falls into the same category as firms that disclose sustainability reports without using the GRI guidelines. Model 5 shows the same results regarding the relationship between the independent variables and compliance. With this dummy variable as a measure for compliance, there is a non-significant relationship between the board of directors and compliance as well. This implies that finding a non-significant relationship between these variables in the main analysis, Table 9 model 2, is not caused by a measurement error of the compliance variable.

Table 10: Robustness checks

Model:	(4) Pc1	(5) COMPLIANCE2
CSP	0.00984*** (0.002)	0.0127*** (0.003)
BOARD	0.113*** (0.027)	0.0994 (0.073)
CSR COM	0.0869 (0.068)	0.513*** (0.146)
STENG	0.249*** (0.064)	1.257*** (0.120)
External Assurance	0.801*** (0.056)	4.614*** (0.369)
LEV	0.0000299 (0.001)	-0.00246 (0.002)
ROA	-0.00586* (0.003)	-0.0265*** (0.008)
ANALYSTS	0.0934* (0.055)	0.240** (0.123)
Listing	0.144 (0.121)	-0.00727 (0.237)
INDUSTRY ^a	Y	Y
	Y	Y
YEAR ^a	Y	Y
	Y	Y
N	3382	4483

* Statistical significance at 10% level.

** Statistical significance at 5% level.

*** Statistical significance at 1% level.

^a Results of Year and Industry dummies are not depicted due to parsimony.

As clearly noted in Tables 9 & 10, the board of directors is not positively significant related to compliance with sustainability reporting guidelines. To gain insight into what is causing this insignificance, a regression is run with the individual board characteristics. Table 10 shows a non-significant relationship between independence and CEO duality and compliance respectively. But, these relationships are positive as expected. Gender diversity has a negative significant relationship with compliance, opposing the expectations. These three relationships result therein that the board of directors has no significant relationship with compliance.

Table 11: Robustness checks with board characteristics

Model:	(6) Compliance
CSP	0.0102*** (0.003)
External Assurance	4.435*** (0.211)
Independence	0.183 (0.113)
Gender diversity	-0.250** (0.112)
CEO duality	0.0921 (0.100)
CSR COM	0.375*** (0.128)
STENG	1.328*** (0.103)
ANALYSTS	0.221** (0.103)
Listing	0.0889 (0.199)
ROA	-0.0140* (0.007)
LEV	-0.00296 (0.002)
INDUSTRY	Y
	Y
YEAR	Y
	Y
Observations	4483

* Statistical significance at 10% level.

** Statistical significance at 5% level.

*** Statistical significance at 1% level.

^a Results of Year and Industry dummies are not depicted due to parsimony.

4.5 Interpretation

Two voluntary disclosing theories, signaling and legitimacy theory, provide explanations why firms make decisions about sustainability reporting disclosure. Signaling theory suggests that firms with superior CSP will choose to comply to distinct themselves from firms with inferior CSP (Verrecchia, 1983). Legitimacy theory suggests that firms with inferior CSP choose to comply to influence the public perceptions about their CSP (Lozano and Huisingh, 2011). The

results provide support for the signaling theory, that firms with superior CSP comply with sustainability reporting guidelines. This could be explained due to the high costs of complying and for firms with superior CSP the benefits outweigh these high costs opposing firms that have inferior CSP (Boiral, 2013).

Several corporate governance mechanisms in this study influence sustainability issues. This means that in absence of mandatory guidelines, these mechanisms provide pressure on firms to increase their CSP and/or to comply with sustainability reporting guidelines. As hypothesized, stakeholder engagement as the most important external corporate governance mechanism puts pressure on firms to both improve CSP and to comply with sustainability reporting guidelines. It is thus a way for firms to manage the interest of stakeholders and to engage with them (Manetti, 2011). Consequently, these stakeholders will put more pressure on their firms resulting that these firms act more accordingly towards sustainability issues (Andriof and Waddock, 2017).

Opposite from stakeholder engagement, the sustainability committee is an internal corporate governance mechanism. The results show that firms with a sustainability committee comply more with sustainability reporting guidelines directly and through CSP as well. Dilling (2010) suggested these results by arguing that firms deal with outside pressures through their sustainability committee. The monitoring power of the sustainability committee is another explanation for why firms comply (Gregg, 2009). However, the results can also be explained from a different perspective. Firms that want to comply and want to increase or sustain their high CSP, will issue a sustainability committee, explaining the results. Firms which do not have these ambitions are less likely to issue such a committee, because it makes little sense to have one and not make use of it.. Firms with a sustainability committee will increase the compliance to truthfully report their (improved) CSP to differentiate them for other firms (Manning et al., 2018). Firms will also try the opportunistic use of complying, by simply complying by masking their CSP (Manning et al., 2018). However the sustainability committee is providing enough pressure on management (Liao et al., 2015) and it is enough involved with the actions and decisions of management (Gregg, 2009), that this opportunistic use is not likely to occur. This explains the positive significant relationship between the sustainability committee and compliance through CSP.

As expected the board of directors put pressure on firms to increase their CSP by better monitoring the firm (Amran et al., 2014). The board of directors also made sure that more sustainability issues are taken into account. The board of directors increases the incentives for firms increase the compliance to truthfully report the (improved) CSP and to differentiate themselves from other firms (Manning et al., 2018). However, firms with inferior CSP could also choose to comply to react to legitimacy threats instead of improving their CSP. However this opportunistic use of inferior firms is mitigated by board monitoring, which means that it will be harder to hide inferior CSP (Manning et al., 2018). This explains the relationship between the board of directors and compliance with sustainability reporting guidelines through CSP.

However the strength of the board only results in an increase in CSP and not directly in complying more with sustainability reporting guidelines. The results from the robustness check, depicted in Table 11, show that this is explained by non-significant relationships from board independence and CEO duality and a negative significant relationship from gender diversity. As for the gender diversity, this means that the more women are in the board, firms take sustainability issues (i.e. complying with sustainability reporting guidelines) less in account. Research suggested that more than 3 women in the board will result in the fact that sustainability issues are taken more in account (Bear et al., 2010; Fernandez-Feijoo et al., 2012; Konrad, Kramer and Erkut, 2008). Which could mean that firms with high amount of women in the board are underrepresented in this study's dataset. The theory that the board of directors effectively monitor and make sure that firms comply with sustainability reporting guidelines (Hummel and Schlick, 2016), is not proved with the results of this research. There has to be an underlying mechanism between the board of directors and the compliance, which explains why firms with greater board strength do not comply. It could be that this study overestimates the strength of monitoring of the board as well overestimating the pressure exercising from the board. Another possible reason for a lack of support for the direct relationship between the board of directors and compliance, is the choice for the board characteristics. Hussain et al. (2018) showed that several other board characteristics could influence decisions relating to sustainability reporting, such as director ownership, board audit committee and board size.

As hypothesized, external assurance positively influences the compliance. However, the higher quality of external assurance is not significantly positively related to compliance. The descriptive

statistics however showed that for first two levels of compliance, there are almost no observations available. Therefore the data is somewhat distorted, which leads to not finding any positive significant relationships. Braam and Peeters (2018) showed that CSP influences the choice of external assurance, but the results show that the relationship is more complicated than that, because the external assurance positively influences the CSP as well.

Furthermore, the results in Table 9 (model 2) show that analysts coverage is positively significant related to compliance. It is also positively significantly related to compliance through CSP, as model 1 shows in Table 9. Therefore, the results show that there is pressure from other corporate governance mechanisms on firms to comply as well. This pressure is exercised, because analysts closely follow firms and if firms do not comply or do not have good CSP, these analysts will notice this (Jo and Harjoto, 2011). The presence of analysts will make sure that firms and the stakeholders are more aligned with each other, because it will be harder for management to pursue their own interests. This alignment makes that more sustainability issues are taken into account (Jo and Harjoto, 2014). This explains the positive relationship between analysts coverage and compliance and between analyst coverage and CSP as well.

Leverage shows no significant relationship with compliance, disputing the theory from Casey and Grenier (2014) that highly levered firms have the potential to prevent extensive sustainability disclosures. The results in table 7 can be interpreted that firms with lower financial performance comply less than firms with lower financial performance.

The descriptive statistics show that roughly two third of the firms in the sample comply with the GRI guidelines, which is reasonably high. Due to increasing pressures from the public, one can expect this percentage to grow even further in the future. However the absence of a mandatory regime will always lead to firms try to make opportunistic use of complying or firms not complying at all. To make sure firms that all firms comply in the future, a mandatory regime is needed.

5. Conclusion and discussion

This study explores pressures arising from corporate governance mechanisms on the compliance with sustainability reporting guidelines for 4483 firms from the time period 2013-2017. A distinction is made between direct and indirect effects through CSP. The results show that the sustainability committee and stakeholder engagement influence the compliance both directly and through CSP. The board of directors, as a major internal corporate governance mechanism, only influences compliance through CSP. The result failed to show that the board of directors influences the compliance directly. External assurance influences the compliance as well, however the results found no evidence supporting that high quality is important in unraveling the relationship with compliance. The results show that in absence of a mandatory sustainability reporting regime, corporate governance mechanisms provide pressure on firms to be held accountable for their actions and decisions regarding sustainability reporting guidelines. This increases both the CSP and the compliance with sustainability reporting guidelines.

This study contributes to the ongoing research into the relationship between corporate governance mechanisms, CSP and compliance with sustainability reporting guidelines. The results of this study show support for signaling theory, which is yet another step of reducing the ambiguity in the literature about the prominent voluntary disclosure theory.

This study has implications for standard setters, since there is not yet a mandatory regime. When firms have inferior corporate governance mechanisms, they are less likely to comply. Therefore to make sure that every firm complies and disclose faithfully and credibly, a mandatory regime is needed in the future. The mandatory regime could also further enhance the quality the sustainability as well as getting rid for the interpretation the guidelines provide (Boiral, 2013; Cho et al., 2012). This research has practical implications for investors and other stakeholders as well, in understanding whether corporate sustainability performance links directly to compliance and thus whether compliance with the sustainability guidelines is a way of hiding inferior CSP or showing superior CSP. Creating awareness for the public puts further pressure on firms to increase their CSP, faithfully report and comply with sustainability reporting guidelines.

This study has several limitations. First of all, the measurement of compliance in this study does not take in account the different levels of compliance within the GRI guidelines. When

sustainability reports are in accordance with the guidelines, there are yet other distinctions within this in accordance level. This could lead to biased results.

Another limitation is that the measure of board strength is composed from only three board characteristics, whereas more characteristics could enhance the board and influence sustainability issues, such as a director ownership (Johnson and Greening, 1999) and board size (Galbreath, 2011). Furthermore, this study has made a distinction at which corporate governance mechanism to use. However there are more corporate governance mechanisms which the literature recognizes with having the potential to influence the compliance with sustainability reporting guidelines. Some examples are ownership structure (Johnson and Greening, 1999), audit committee (Allegrini and Greco, 2013) and media coverage (Manning et al., 2018). The same potential problem applies to the control variables, because the selection of control variables is limited in this study. Further research is therefore needed with other corporate governance mechanism to provide even more insight into the reasons for complying with sustainability reporting guidelines.

The relationships between the corporate governance mechanisms and sustainability reporting can be further examined, to provide some further evidence and further insight. Sustainability committee for example has the power to create (non) monetary incentives to improve actions and decisions on sustainability issues (Liao et al., 2015). Further research could be to provide evidence for the underlying mechanism that resulted in positive relationship between compliance and the sustainability committee.

This study argues that firms increase their CSP and comply with sustainability reporting guidelines due to pressure from corporate governance mechanisms. These results can also be used to combination with other studies about sustainability. Bansal and Roth (2000) for example suggest that there are economic reasons behind firms with sustainability decision. Another viewpoint will be to focus on the management individual characteristics, i.e. if they feel social responsible for their actions personally and base their actions and decisions on this (Bansal and Roth, 2000).

The results also show the interrelatedness between external assurance, CSP and compliance. Braam and Peeters (2018) found that CSP influences the choice of issuing external assurance. The results of this research (Table 9) show that external assurance positively influences the CSP

as well. This implies that the relationship between CSP and external assurance works both ways. Further research is needed to provide insights into this difficult relationship and their relatedness with compliance as well. If CSP is a determinant of why firms external assurance their sustainability reports, there is a need for more research into the other possible determinants for externally assuring sustainability reports. A possible way of conducting such research could be to use the corporate governance mechanisms, which have the power to both influence external assurance and compliance.

In general, further research is needed at what to reach further insight in what drives firms to comply with sustainability reporting guidelines.

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7. Appendix

Appendix A:

Table 12: Sample distribution

Country	Industry						Total
	1	2	3	4	5	6	
Argentina	20	2	0	2	0	0	24
Australia	88	10	5	5	0	15	123
Austria	9	5	0	0	0	0	14
Belgium	37	5	0	4	0	5	51
Brazil	84	34	0	6	5	5	134
Canada	146	15	4	10	5	5	185
Channel Islands	0	0	0	0	0	3	3
Chile	32	10	0	5	0	2	49
Colombia	11	6	1	9	0	1	28
Czech Republic	0	5	0	0	0	0	5
Denmark	53	5	15	8	5	0	86
Ecuador	0	0	0	0	5	0	5
Finland	83	10	0	0	5	0	98
France	167	10	10	14	5	5	211
Germany	98	15	10	3	10	9	145
Greece	11	4	0	15	0	0	30
Hong Kong	12	5	19	14	0	0	50
Hungary	0	5	0	0	0	0	5
India	63	9	0	8	0	5	85
Indonesia	30	9	0	4	0	0	43
Ireland	22	0	0	0	0	0	22
Israel	5	0	0	0	0	0	5
Italy	46	19	0	14	0	5	84
Japan	454	5	20	5	10	5	499
Jersey	1	0	0	0	0	0	1
Jordan	0	0	0	4	0	0	4
Korea	99	10	5	9	5	5	133
Kuwait	0	5	0	0	0	0	5
Luxembourg	1	0	0	0	0	10	11
China	89	26	6	24	5	8	158
Malaysia	25	23	0	10	0	0	58
Mexico	46	5	2	1	5	5	64
Morocco	0	0	0	5	0	0	5
Netherlands	65	0	10	3	4	0	82
New Zealand	1	10	0	0	0	0	11

Norway	7	0	5	5	4	0	21
Peru	8	0	0	0	0	0	8
Philippines	10	0	0	0	0	0	10
Poland	9	18	0	0	0	0	27
Portugal	12	5	0	0	0	0	17
Qatar	0	0	0	9	0	0	9
Russia	42	5	0	5	0	0	52
Saudi Arabia	0	5	0	0	0	0	5
Singapore	4	5	0	5	0	5	19
South Africa	227	15	10	15	25	32	324
Spain	60	30	0	14	0	0	104
Sri Lanka	5	0	0	0	0	0	5
Sweden	130	9	6	9	0	10	164
Switzerland	64	1	0	0	5	16	86
Taiwan	134	10	9	14	10	0	177
Thailand	35	5	5	15	0	5	65
Turkey	0	0	0	5	0	0	5
UK	319	30	8	16	10	48	431
USA	337	44	15	18	5	19	438
Total	3,201	449	165	312	128	228	4,483

Note that the industry is coded as follows: 1) Industrial; 2) Utility; 3) Transportation; 4) Bank/Savings/Loan; 5) Insurance; 6) Other financial.

Appendix B:

Table 13: Vif test 2

Variable	VIF	1/VIF	
BOARD	4.51	0.221821	
CSRCOM	5.90	0.169518	
STENG	4.56	0.219420	
External Assurance	1.88	0.530997	
LEV	4.58	0.218115	
ROA	1.74	0.574827	
ANALYSTS	2.38	0.419955	
listing	8.54	0.117136	
INDUSTRY			
	2	1.21	0.823128
	3	1.08	0.925977
	4	1.27	0.787064
	5	1.06	0.943348
	6	1.09	0.917319
Mean VIF	3.06		

