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Board composition and corporate sustainability reporting quality

BY Kelly Hesselink (s4391667)
Master economics
Specialization: Accounting & Control

Supervisor: Dr. Geert Braam RA
Second reader: Dr. D. Reimsbach

Abstract

This study examines the effect of the composition of the board of directors on corporate sustainability reporting (CSR) quality. It is argued that board expertise, interlocking directorates, board independence, and board diversity will enhance CSR quality. These characteristics provide the board with better information, new insights, and new perspectives related to sustainability, which increases the sustainability knowledge on and commitment of the board to CSR, and improves the capability of the board to monitor management. Using a unique panel data set of 123 publicly-listed and private companies in the Netherlands for the years 2013-2015, the results provide some support for a positive effect of board expertise on CSR quality. Furthermore, when examining the combinations of the different board characteristics, it seems that the combinations of interlocking directorates and board diversity, and of board expertise and board independence, when measured using CEO duality, negatively affect CSR quality. In addition, it seems that the combinations of board expertise and board activity, of interlocking directorates and board activity, and of board expertise and independence, when measured using the proportion of independent directors, positively affect CSR quality. These findings suggest that the effect of board composition on CSR quality might not be as important as initially thought, however, in practice, the combination of the different board characteristics seems to be important.

Content

1. Introduction

Corporate sustainability reporting (CSR) has received increasingly more attention and importance in the business world recent years, as organizations are being held more accountable for climate change, child labor and other social, ethical and environmental responsibilities (Baxi & Ray, 2009; Money & Schepers, 2007; TED Case Studies, 2002; Dutta, Lawson & Marcinko, 2012). Furthermore, there is an increase in socially responsible investments, and the corporate sustainability report is more often used in equity analyses of businesses (Holder-Webb, Cohen, Nath & Wood, 2009). However, despite the importance of CSR, the disclosure of these reports is not regulated. While some governments encourage the publication of sustainability information, most corporate environmental disclosures are voluntarily. It are the ultimate decisions of the management and board of directors of the company. Besides its voluntary nature, CSR publications increase rapidly among the major companies (Prado-Lorenzo, Rodrígues-Domínguez, Gallego-Alvarez & García-Sánchez, 2009; Rupley, Brown & Marshall, 2012). Before publishing a corporate sustainability report, the board of directors and the management of the company need to gain an understanding of the social and environmental consequences of the operations of the company, and need to ensure that the company is responsive to the views of its stakeholders (Chan, Watson & Woodliff, 2014). If the board of directors and management decide to publish a corporate sustainability report, they voluntarily reduce the information asymmetry, related to sustainability, between the company and its stakeholders. Consequently, CSR shows the commitment of the company to social, ethical and environmental issues, and shows that the company wants to have a good environmental reputation. However, the achievement of these outcomes depends on actual CSR quality (Simnett, Vanstraelen & Chua, 2009).

The board of directors decides, together with management, how much to disclose and what to disclose, which ultimately influences CSR quality. The decision of management and the board of directors to voluntarily reduce the information asymmetry between the stakeholders and the company, by providing high quality CSR, depends on the capability of the board to monitor management and thereby reducing the goal incongruence between management and the company's stakeholders. The composition of the board determines its monitoring capability and its ability to respond to sustainability issues (Rupley et al., 2012). Board expertise, interlocking directorates, and board diversity provide the board of directors with more information, new insights and new perspectives. These can all enhance CSR quality by increasing the sustainability knowledge on and commitment of the board to CSR, and by improving the capability of the board to monitor management (Adnan, Staden & Hay, 2010; Barka & Dardour, 2015). Independence of the board increases the commitment of the board to its stakeholders, which increases the incentives of the board to monitor management and to provide high quality CSR (Barako & Brown, 2008). Thus, the composition of the board determines how the board of directors is able to monitor management, and to provide high quality CSR. Therefore, this study investigates the influence of the board of directors on corporate sustainability reporting quality by examining how board composition (board expertise, interlocking

directorates, board independence, and board diversity) is related to corporate sustainability reporting quality.

Using data on the period 2013-2015 for 123 publicly-listed and private companies in the Netherlands, the results provide some support for a positive effect of board expertise on CSR quality. Interlocking directorates and board diversity seem to be insignificant. For independence the results indicate that there might be some 'critical mass', for which there needs to be a minimum proportion of independent directors on the board to influence CSR quality. The results also indicate that it might be that independence alone does not have an influence on CSR quality, but that a combination of independence with the other board characteristics positively influences CSR quality. However, the combinations of board expertise and independence, when measured using CEO duality, and of interlocking directors and gender-diversity seem to have a negative effect on CSR quality. Furthermore, it seems that the combinations of board expertise and board activity, of interlocking directorates and board activity, and of board expertise and board independence, when measured using the proportion of independent directors, positively influence CSR quality.

This study contributes to literature in several ways. First, much research focuses on the effect of board composition on corporate social responsibility or corporate social responsibility disclosure (Liao, Luo & Tang, 2015; Haque, 2017; Ben-Amar & Mcllkenny, 2014; Chan et al., 2014; Samaha, Khlif & Hussainey, 2015; Galbreath, 2017; Sainty, 2009; Shamil, Shaikh, Ho & Krishnan, 2014; Sundarasen, Je-Yen & Rajangam, 2016; Kiliç, Kuzey & Uyar, 2015; Michelon & Parbonetti, 2012; Rao & Tilt, 2016). However, these studies do not focus on the effect of board composition on CSR quality. For that reason, this study examines the influence of board composition on CSR quality.

Second, research on the effect of board composition on CSR does not take into account the effect of interlocking directorates on CSR (Amran, Lee & Devi, 2014; Adnan et al., 2010; Jizi, Salama, Dixon & Stratling, 2014; Jizi, 2017, Liao et al., 2015; Samaha et al., 2015; Sainty, 2009; Shamil et al., 2014). Interlocking directorates increase the knowledge and experience, related to sustainability, of directors on other companies and also lead to imitation of high quality CSR companies, which might positively influence the CSR quality (Davis, 1996; Aerts, Cormier & Magnan, 2006). Hence, this study takes into account the effect of interlocking directorates on CSR quality.

Third, research on the effect of board composition on CSR does not take into account the combinations of different board characteristics (Amran et al., 2014; Adnan et al., 2010; Jizi, et al., 2014; Jizi, 2017, Liao et al., 2015; Samaha et al., 2015; Sainty, 2009; Shamil et al., 2014; Rao & Tilt, 2016; Michelon & Parbonetti, 2012). For example, it might be that independence and expertise interact with each other. When there is high independence on the board it might have no effect on CSR quality, but as there is also a high expertise on the board the combination of the two might enhance CSR quality. Therefore, this study takes into account the interaction between the board characteristics.

Fourth, the study provides evidence which can be used for practical issues related to CSR. It increases the understanding and discussion on the quality of CSR, and provides a foundation for more efforts to enhance CSR quality (Amran et al., 2014). It provides insights to managers and directors how the composition of their board effects CSR quality. They can use these insights when appointing or introducing a new member to the board of directors. In addition, corporate governance standard setters should consider the differences in composition of the board, when they assert the benefits of corporate governance on CSR quality (Michelon & Parbonetti, 2012).

The remainder of this study is structured as follows. Section 2 provides a literature review, which ends in the formulation of the hypotheses regarding the effect of board composition on CSR quality. Section 3 describes the variables, model and method used in this study. Section 4 provides the results of the study and section 5 discusses the findings, limitations and possibilities for future research. Section 6 concludes.

2. Literature review and hypotheses

2.1 Theoretical framework

2.1.1 Agency theory

Agency theory suggests that there is a relationship between the agent and the principal, in which the principal delegates work to the agent but is not able to monitor the behavior of the agent. The principals cannot continually oversee the behavior of the agents of the company, which indicates a separation of ownership and control. Accordingly, the principals provide decision making authority to the agents (Ross, 1973). However, this could lead to an agency problem as there might be incongruence between the goals of the agent and the principal (Eisenhardt, 1989). This indicates that both agents and principals are utility maximizers, in which agents can act in their own interest which might not be in line with the interest of the principals. To overcome this situation, principals might incur monitoring costs or bonding costs to establish incentives for the agents to act in the best interest of the principal. If the agent does not act in the interest of the principal, the principal might suffer from a residual loss as the agent does not maximize the principal's utility. These costs, to align the goals of the principal and the agent, are called the agency costs (Jensen & Meckling, 1976). However, as a situation becomes more complex, it is even harder to monitor the agent because of information asymmetry. The agent has more information about the company and his task performance than the principal (Gomez-Mejia & Balkin, 1992).

In this study, the stakeholders-managers relationship is considered a principal-agent structure as the stakeholders all have interests in the company and cannot oversee the task performance of the management relating to sustainability issues. To reduce the goal incongruence between the stakeholders and the managers, related to corporate sustainability, the board of directors has an important monitoring and advising role on the task performance of management. The board of directors monitors and advises management, and wants to create more value for the company and its

stakeholders (de Andres & Vallelado, 2008). In order for the board to exercise its monitoring function, it needs the right mix of capabilities and experiences to assess business strategies and to evaluate management and its impact on CSR (Hillman & Dalziel, 2003; Bear, Rahman & Post, 2010). This monitoring and advising capability of the board depends on the composition of the board, with more expertise, more independence, and more diversity on the board increasing its monitoring and advising capability (Jizi, 2017; Michelon & Parbonetti, 2012; Jizi et al., 2014; Amran et al., 2014; de Villiers, Naiker & van Staden, 2011; Rupley et al., 2012; Shaukat, Qiu & Trojanowski, 2016; Hillman & Dalziel, 2003; Bear et al., 2010; Liao et al., 2015; Sundarasen et al., 2016). In addition, interlocking directorates are also taken into account, because they increase the director's experience, insights, and imitating possibilities (Mandojana & Aragon-Correa, 2015). Moreover, the combination of these board characteristics is also of importance. It is likely that some of these board characteristics only influence CSR quality if they are combined with one of the other characteristics. For example, board independence will alone probably not have an effect on CSR quality, but combined with board expertise, it will probably positively effects CSR quality.

Besides reducing the goal incongruence between the stakeholders and the managers, the board of directors, when corroborating with the managers, may issue a corporate sustainability report to reduce the information asymmetry between the managers and the stakeholders. By providing high quality CSR, the sustainability reputation of the company will increase, and the sustainability demands of stakeholders will be managed (Chan et al., 2014). However, as indicated, the information regarding corporate sustainability is non-financial, and is a purely voluntary decision as the disclosure of these reports is not regulated. The decisions to provide a sustainability report and how much to disclose are managerial, and influenced by the board of directors of the company (Rupley et al., 2012). Two theories, voluntary disclosure theory and legitimacy theory, provide different reasons for why the board of directors, together with management, decides to voluntary issue a high quality sustainability report. Both theories indicate that by providing sustainability reports, information asymmetry will be reduced, which enhances the capability of shareholders and other stakeholders to make decisions about the company and to monitor the company. However, both theories provide a different explanation on why companies voluntary disclose their corporate sustainability reports.

2.1.2 Voluntary Disclosure Theory

According to voluntary disclosure theory, companies can reduce the problem of information asymmetry by unraveling private corporate sustainability information. The unraveling of information should be truthful and is not costless, which means that managers and directors only want to provide sustainability information if it is favorable information. The favorable information is only disclosed if it exceeds some critical threshold level, as it provides costs to provide the corporate sustainability report (Guidry & Patten, 2012). This indicates that only good environmental performers want to reveal their type by issuing a high quality corporate sustainability report, thereby reducing the

information asymmetry problem. Bad environmental performers are not able to provide this high quality CSR, as they do not have much favorable sustainability information. This enables stakeholders to make a distinction between good environmental performers and bad environmental performers (Clarkson, Li, Richardson & Vasvari, 2008). The bad environmental performers, who do not reveal their type, hope stakeholders will seem them as an 'average type' by not disclosing a CSR report.

Bewley & Li (2000) examine the disclosure of environmental information by Canadian manufacturing firms, and find evidence supporting the voluntary disclosure theory. They show that companies with more media coverage, higher pollution propensity, and more political pressure have higher quality CSR. Furthermore, Clarkson et al. (2008) examine the disclosure of environmental information by polluting industries in the US, and find evidence supporting voluntary disclosure theory. There is a positive association between the quality of the environmental disclosures and the environmental performance of the firm. In addition, Hummel & Schlick (2016) examine the relationship between sustainability performance and sustainability disclosure by examining different European firms. They find that good environmental performers choose high-quality CSR to signal their high performance to the market, as predicted by voluntary disclosure theory.

2.1.3 Legitimacy Theory

According to legitimacy theory, the activities and operations of the company should be proper and desirable within the norms, beliefs, and values of the society in which the company operates. Central to legitimacy theory is the social contract between the company, and those affected by the operations of the company. The social contract represents the expectations that society has on the conduct of operations by the company (Guthrie, Petty, Yongvanich & Ricerri, 2004). On the one hand, when the company complies with the contract, and society considers the company as legitimate, the company remains to exist and can use the community's resources. On the other hand, when the company does not comply with the contract, and society considers the company not as legitimate, the company will be threatened by the society. Hence, the company is likely to attempt to secure the legitimation of society by the activities and operations it performs (Adnan et al., 2010; Chan et al., 2014; Brown & Deegan, 1998). To secure their legitimation, the company can use four different strategies: inform and educate stakeholders about the performance of the corporation, change the perceptions of the stakeholders, but not change corporate behavior, manipulate perceptions of stakeholders by distracting attention away from the issue of concern, or change the expectations of the stakeholders of corporation's performance (Lindblom, 1994; Guthrie et al., 2004; Adnan et al., 2010). However, the norms, beliefs, and values of society change over time, so companies should continually show that their operations are legitimate. When the operations of the company are not compliant anymore with the norms, beliefs and values of society, managers and directors can set up remedial strategies. These strategies include disclosing important information of the company to the society as an apology to society, and to change the perspective of society (Hooghiemstra, 2000; Cormier & Gordon, 2001;

Chan et al., 2014).

Nowadays, the society expects the company to act in a more socially and environmental responsible manner (Money & Schepers, 2007; Moire, 2001). The publication of high quality CSR reports indicates the commitment of the company to the norms, beliefs, and values of the society. It shows that the company secures its legitimacy to society by informing and educating the society about its sustainability and social issues, which enables bad environmental performers to use sustainability disclosure as a tactic to influence the perception of the society regarding its legitimacy. Thus, according to legitimacy theory, the managers and directors can provide high quality CSR to show the legitimacy of the company or as a remedial strategy (Gray, Kouhy & Lavers, 1995; Hooghiemstra, 2000).

Brown & Deegan (1998) examine the effect of media attention on the public disclosure of environmental information. They show that companies with more media attention provide more environmental information to society, to show that they operate in a legitimate manner, which supports legitimacy theory. This is also indicated by Magness (2006) by examining Canadian gold mining companies. She shows that companies with more press releases disclose more information than companies with fewer press releases. Furthermore, Mobus (2005) examines the relationship between environmental regulatory performance and mandatory environmental performance in the US oil industry. She finds support for legitimacy theory, by indicating that organizational legitimacy is threatened by regulatory non-compliance disclosures. These organizations are then more likely to comply subsequently, to minimize the negative effect of the mandatory accounting disclosures.

2.2 Development of hypotheses

As indicated above, the two assumptions of agency theory, information asymmetry and goal incongruence, explain why companies encourage high quality CSR. The composition of the board determines its capability to reduce information asymmetry, by providing high quality CSR, and goal incongruence, by monitoring management. As indicated, it is argued that the monitoring and advising capability of the board depends on the composition of the board, with more expertise, more independence, and more diversity on the board increasing its monitoring and advising capability. In addition, interlocking directorates increase the director's experience, insights, and imitating possibilities. Moreover, the combination of these different board characteristics is important, as it is likely that some of these board characteristics only influence CSR quality if they are combined with one of the other characteristics.

2.2.1 Board expertise and CSR quality

The board of directors consists of directors with their own background, different education programs, director nominations, board performance evaluations, and experience, which all influence the board's expertise (Roy, 2008; Guest, 2009). Board expertise increases the knowledge and skills on the board,

and these experts can provide advice and direction on different organizational actions and operations. They indicate the effect of actions on corporate sustainability, alert the board to new investment opportunities that increase the capability of the company to respond to sustainability issues, and provide sustainability expertise through their human capital (de Villiers et al., 2011). In addition, the experts can help the board to enhance their understanding on how the organization works, which improves their monitoring capability and helps in determining the best corporate sustainability strategy. Board expertise also helps in evaluating this strategy implementation, and can help to determine the rewards for top management (Hillman & Dalziel, 2003; Baysinger & Butler, 1985). Moreover, the board of directors is able to establish different activities and programs, by using their expertise, to manage and enhance sustainability issues of the company and to improve CSR quality. An example of such a program is that management can appoint a manager or committee to deal with corporate sustainability (Michelon & Parbonetti, 2012). Thus, by increasing the board's capabilities with their experience, knowledge and skills, experts are likely to reduce the goal incongruence between managers and stakeholders and to stimulate the publication of a high quality CSR report to reduce information asymmetry.

Shaukat et al. (2016) show that higher corporate sustainability orientation of the board, which is partly measured by expertise on the board, indicates a more comprehensive and proactive corporate sustainability strategy and higher corporate sustainability performance. Furthermore, Rupley et al. (2012) show that voluntary environmental disclosure is positively related to board expertise, as there are more greenhouse gas disclosures when there is an environmental committee on the board. This is also found by Adnan et al. (2010), as they show that companies with a CSR committee are more likely to provide information on greenhouse gas emissions than the companies without a CSR committee. Harjoto, Laksmana & Lee (2015) indicate that board expertise increases CSR quality by reducing the sustainability concerns of the company. Furthermore, Liao et al. (2015) show, by examining greenhouse gas disclosures in the United Kingdom, that a board with an environmental committee is more environmental transparent. In summary, it is expected that board expertise will have a positive effect on CSR quality. This leads to the first hypothesis:

H1: Board expertise has a positive effect on CSR quality.

2.2.2 Interlocking directorates and CSR quality

Interlocking directorates indicate that a director is designated to multiple boards. This can be either an executive or non-executive director, but most interlocking directorates are created by non-executive directors (Hashim & Rahman, 2010). The interlocking directorates improve the communication and information sharing between different companies, and provide a channel for the transfer of knowledge related to sustainability information. The directors can learn by acquiring knowledge and skills due to the different interlocking directorates, which improves their ability to increase CSR quality. It also

enhances the directors' experience and business expertise, which enhances their ability to debate and inform others about corporate sustainability (Barka & Dardour, 2015). The board members are exposed to different practices within companies and gain knowledge from interactions with other board members relating to corporate sustainability, which increases their ability to update the sustainability knowledge on their current board. Even if this knowledge is publicly available, it helps the company by providing the knowledge at zero costs, and by providing knowledge with a higher value, as it is provided by a board member with internal experience of the company. This makes board members with interlocking directorates value-adding board members (Rupley et al., 2016; Mandojana & Aragon-Correa, 2015). The interlocking directorates enhance also the diffusion of sustainability information across companies, as they serve as a mechanism to access strategic information, to enhance environmental scanning, to diffuse innovative ideas related to sustainability, to influence organizational processes, and to reveal information about the operations of other companies. Accordingly, interlocking directorates play an important role in future sustainability strategy setting (Hillman & Dalziel, 2003; Judge Jr. & Zeithaml, 1992). In addition, the interlocking directorates also show the reputation and the ability of the director to improve decision-making at the board. When the director has a higher reputation and serves on more boards, his/her decision-making capability will be higher. In case of sustainability issues, the director will have more experience and knowledge to manage these situations due to its interlocking directorates (Hashim & Rahman, 2010; Mandojana & Aragon-Correa, 2015). Furthermore, interlocking directorates can also be used as mimetic isomorphism. The directors can use the insights and experiences from the other boards, to imitate policies of the other companies. The directors learn from the decision-making and participation in the other board, and therefore they can rehearse these experiences at the focal company. Hence, the interlocking directorates facilitate the directors to imitate a sustainability strategy or CSR report from another company, especially when they view the other company to be more legitimate and successful (Ajagbe, Aworemi & Ajetomobi, 2009; Darus, Hamzah & Yusoff, 2013).

Mandojana & Aragon-Correa (2015) show that, by examining privately owned firms in the United States, interlocking directorates positively influence the environmental performance of a firm in case of both higher and lower levels of interlock diversity, and in case the firm has a larger parent company. Furthermore, Haniffa & Cooke (2005) indicate that a chair with multiple directorships enhances the corporate social disclosure in Malaysian countries. Haynes & Hillman (2010) indicate that board capital, partly measured by interlocking directorates, has a positive effect of strategic change in a company. In summary, it is expected that interlocking directorates will have a positive effect on CSR quality. This leads to the second hypothesis:

H2: Interlocking directorates have a positive impact on CSR quality.

2.2.3 Board independence and CSR quality

Independent directors are less controlled by the CEO and management, less involved with the execution of the company's operation and implementation of controls, and have a more diverse background. They provide an outside perspective to the company, are often exposed to CSR in other settings, and have the desire to provide high quality CSR to manage the interests of stakeholders. Hence, they are expected to be more objective when they judge the performance of management, to have a wider look beyond the financial measures of the company, to assist the company in corporate sustainability strategy setting, and to be more inclined with CSR (Ibrahim, Howard & Angelidis, 2003; Jizi et al., 2014; Rupley et al., 2012). Furthermore, as independent directors are more inclined with stakeholders, they are more sensitive to the needs of society and provide more information, legitimacy and resources to the board to increase CSR. By managing the interests of stakeholders, they have an important role in enhancing the corporate sustainability image of the company and to make sure that management performs its corporate sustainability tasks properly. Thus, as the independent directors are more inclined to provide a good sustainability image of the company, they will increase the quantity and quality of CSR (Said, Hj Zainuddin & Haron, 2009; Harjoto & Jo, 2011; Abdullah, Mohamad & Mokhtar, 2011). This makes them more successful and effective in controlling and monitoring management and encouraging managers towards higher levels of transparency and long-term value maximizing activities. Their compensation is also not based on the short-term performance of the company, which makes them even more inclined to provide long-term corporate sustainability (Cheng & Courtenay, 2006; Ibrahim et al., 2003). When independence is neglected, the monitoring power of the board will be reduced, which gives managers more power and the ability to make decisions that are not in the interests of stakeholders, or to even withhold sustainability information from stakeholders. The ability of the board to effectively monitor management, and to reduce the information asymmetry by providing high quality CSR, will then be reduced (Rupley et al., 2012, Said et al., 2009).

Previous research shows that boards with a higher proportion of independent directors are more supportive to the CSR activities of the firm, encourage a higher level of voluntary disclosure, and pay more attention to the firm's social impact than firms with less independent directors on the board (Johnson & Greening, 1999; Jizi et al., 2014; Cheng & Courtenay, 2006). Independent directors are more inclined with the perception of the social profile of the firm, and they promote the quality of corporate sustainability information. Independent directors want to reduce the information asymmetry between the insiders of the firm and the outsiders of the firm by disclosing high quality CSR reports (Jizi et al., 2014; Johnson & Greening, 1999). Independent directors pressure the company to provide high quality CSR to ensure the congruence between the decisions of the company and the societal values and legitimacy (Michelon & Parbonetti, 2012). Thus, a board with a higher independence encourages the company to provide a higher degree of transparency in their corporate sustainability

reports and is better able to monitor management. In summary, it is expected that board independence will have a positive effect on CSR quality. This leads to the third hypothesis:

H3: Board independence has a positive effect on CSR quality.

2.2.4 Board diversity and CSR quality

Board diversity leads to a mix of experiences and capabilities on the board, which provides the company with different perspectives and backgrounds, and a wider range of skills and knowledge. This leads to a broader set of information and more decision creativity on the board, which makes the board better able to recognize the different interests of the stakeholders of the company. Hence, it increases the ability of the board to specify a sustainability strategy that best aligns the interests of the different stakeholders and to manage conflicts between the stakeholders, which enhances the capability of the company to comply to societal expectations (Harjoto et al., 2015). In addition, the diverse backgrounds and perspectives of the different board members lead to more questions being asked that would not have been asked by directors with the same traditional background, and increases the in-depth conversations on the board. As the board members perceive problems from different perspectives, this results in more solutions and a wider range of consequences of the different solutions for sustainability issues. This forces the board to discuss and present the most relevant information and to prevent itself from choosing a solution too quickly, which enhances the quality but also the quantity of the board meetings. By examining all different perspectives and solutions, sustainability issues will be handled in a better way, which increases CSR quality (Watson, Johnson & Merritt, 1998; Carter, Simkins & Simpson, 2003; Rao & Tilt, 2016). Moreover, the different experiences and capabilities of the board members increase the ability of the board to monitor management, evaluate management strategies, and to assess management practices and the influence it has on CSR (Hillman & Dalziel, 2003; Jizi, 2017).

However, more board diversity can also have drawbacks. First, because board diversity provides more different perspectives, the decision-making process takes longer. This is especially hard if a decision has to be made on a short-term basis. The board faces challenges regarding conflicts and dissatisfaction among the board when making decisions, which slows down the decision-making process (Rao & Tilt, 2016). Secondly, the decision-making process on the board will likely split the board in a majority group and a minority group. The majority group will probably favor those who are similar to them, and disfavor those who are dissimilar to them. Accordingly, the contributions of the minority group will be dismissed. This can decrease the quality of decision-making, as not all possible solutions and suggestions are taken into account (Nielson, 2010).

Despite these drawbacks, most of the studies show that board diversity has a positive effect on corporate sustainability, and monitoring management's corporate sustainability performance. For example, Harjoto et al. (2015) provide evidence, by examining US firms, that board diversity has a

positive association with corporate social responsibility performance. Furthermore, Rupley et al. (2012) show that board diversity has a positive association with the voluntary environmental disclosure of information. Bear et al. (2010) also show that the number of women on the board increases the corporate social responsibility ratings of the companies. Furthermore, Barako & Brown (2008) indicate, among Kenyan banks, that a higher level of women representations on the board is associated with more corporate social disclosure. In summary, besides the drawbacks of board diversity, diversity will lead to higher quality decision-making, problem-solving, monitoring and strategy setting for the company. Thus, the positive effects of board diversity will outweigh the negative effects and it is expect that board diversity will have a positive impact on CSR quality. This leads to the fourth hypothesis:

H4: Board diversity has a positive effect on CSR quality.

2.2.5 Combinations of different board characteristics

The studies cited above do not provide any indication about the existence of combinations or synergies among the different board characteristics. Yet, there might be a unique combination of more general factors between the board characteristics. The four board characteristics differ in the way that they influence the willingness and ability of the board to provide high quality CSR. Board expertise increases the knowledge of the board and thereby enhances CSR quality. Interlocking directorates allow the company to imitate CSR of high environmental performance companies, which also increases CSR quality. Board diversity means that there are more different views on the board, which also increases CSR quality. Lastly, an independent board is more inclined with the social perception of the company and increases the commitment of the board to corporate sustainability, which enhances CSR quality. Furthermore, all four aspects of board composition provide an increased capability of the board to monitor management, and thereby reducing the goal incongruence between management and the stakeholders. Nonetheless, it is likely that, for example, board independence alone will not have an effect on CSR quality. If it is combined with board expertise, however, there might be a positive effect on CSR quality. Thus, it is likely that CSR quality is higher when the board characteristics interact. The existence of a combination of board characteristics might also have synergic impacts on CSR quality, as they all have a positive effect on CSR quality. For example, it might be that a higher board diversity leads to even higher quality CSR when there is a high board expertise, as board expertise might reduce the disadvantage of board diversity relating to slow decision-making. Since the analysis of these interactions are all explorative in nature, there is only one meta hypothesis formulated.

H5: There will be positive incremental effects of the combination of board characteristics on CSR quality.

3. Method

3.1 Sample

The total data sample consists of 369 observations of 123 publicly-listed and private companies in the Netherlands during the period 2013-2015. This sample is selected based on the Global Reporting Initiative Disclosure Database, which contains information on the publications of sustainability reports of companies all over the world. From this database there was a selection made for companies in the Netherlands, who published a sustainability report in 2015, 2014 and/or 2013. This resulted in 163 companies, however not all companies could be taken into account as there was no data available regarding their board of directors[1]. 123 Dutch companies remained in the dataset and for them there was data added, if available, for the years 2015, 2014 and 2013. This results in 369 observations, for which there are 40 observations deleted as there is no data available for all three years[2]. The final dataset consists of 48 listed companies and 75 non-listed companies.

The study focuses on the Netherlands as it is a progressive country regarding corporate sustainability. The Dutch government encourages sustainability reporting by providing guidelines regarding the sustainability practices and reporting of companies (Stibbe, 2016). In addition, the Netherlands are also on place six of 62 in the Dow Jones sustainability index, which focuses on the sustainability related to governance, social and environmental factors (Robecosam, 2016a). Dutch companies are also highly listed on the Dow Jones sustainability index, with Unilever NV, Royal Philips NV, Royal DSM NV, and PostNL NV having the best sustainability performance in their industry (Robecosam, 2016b). Furthermore, the Dutch government is also involved in regulation regarding the board of directors. From 2013 on there is new legislation implemented that states that there should be at least 30% women on the board of directors. This legislation applies to publicly listed companies in the Netherlands (Hogan Lovells, 2014). Thus, the Netherlands is an interesting country to examine the effect of board composition on CSR quality.

The data on CSR quality is obtained from the Global Reporting Initiative Disclosure Database, for which the sustainability and annual reports are checked for congruence to different sustainability guidelines. The data on the board composition and most control variables (size, leverage, board size, board activity, listed and financial performance) is collected from Orbis, ThomsonOne, BoardEx, annual reports, sustainability reports, and the companies' websites. First, it is examined whether Orbis has the data on the different board characteristics and control variables, when this is not the case, ThomsonOne and BoardEx are used. If none of the databases contains data on the board composition or control variables of the company, the annual reports, sustainability reports, and websites of the company are examined. The annual reports and sustainability reports are obtained

[1] For 25 companies there was no data found on their Board of Directors in either Thomson One, Orbis, Boardex, or their annual report. These companies were excluded from the dataset.

[2] For 28 companies there is no data regarding the sustainability guidelines for 1 year, and for 6 companies there is no data regarding the sustainability guidelines for two years.

from the Global Reporting Initiative Disclosure Database, and when not available there, from company.info[3].

Table 1 provides an overview of the amount of observations for the different sustainability guidelines of corporate sustainability reports per year for the years 2013, 2014, and 2015. In addition, it shows the percentage of companies per year that comply and do not comply with the sustainability guidelines. Most reports comply with the UNGC guideline, with for the total number of years, 29% compliances. However, this amount is decreasing over time, as 33% of the reports complies with this guideline in 2013, but only 23% of the reports complies with this guideline in 2015. The reports which comply with the ISO 26000 guideline and have a stakeholder panel/expert opinion are increasing over the years, with 11% and 7% compliances in 2013 and 14% and 11% compliances in 2015 respectively. There are no companies that comply with the AA1000 guideline, in any of the years. Table 2 provides an overview of the amount of observations for the different external assurance guidelines of corporate sustainability reports per year for the years 2013, 2014, and 2015. In addition, it shows the percentage of companies per year that comply and do not comply with the external assurance guidelines. Taken the years together, in 50% of the cases the sustainability reports are assured. However, in 2013 this was only 48% and for 2015 this was already 58%. Most reports comply with a national sustainability assurance standard, with for the total number of years, 19% compliances. However, this amount is decreasing over time, with 32% compliances in 2013 and only 9% compliances in 2015. For the ISAE3000 guideline, the amount of sustainability reports that complies to it slowly increases over time from 4% in 2013 to 9% in 2015. In addition, table 3 shows the amount of observations per year for the different industry groups and for non-listed and listed companies. Most companies are from the "Manufacturing" industry, followed by the "Finance and insurance" industry and the "Professional, scientific, and technical services" industry. There are no observations for the "Educational services" industry and for the "Public administration" industry. There are 132 observations for listed companies and 197 observations for non-listed companies.

[3] For 2015, for 6 listed companies and 6 non-listed companies the annual report is used for the data. For 2014, for 1 listed company and 13 non-listed companies the annual report is used for the data. For 2013, for 1 listed company and 11 non-listed companies the annual report is used for the data

Table 1. Overview number of observations sustainability guidelines for total sample per year

	SDGs			CDP			IFC			OECD			UNGC			ISO 26000			AA 1000			Stakeholder panel/ expert opinion		
Year	Obs.	1* (%)	0** (%)	Obs.	1* (%)	0** (%)	Obs.	1* (%)	0** (%)	Obs.	1* (%)	0** (%)	Obs.	1* (%)	0** (%)	Obs.	1* (%)	0** (%)	Obs.	1* (%)	0** (%)	Obs.	1* (%)	0** (%)
2015	104	12	88	104	16	84	104	1	99	104	10	90	104	23	77	104	14	86	104	0	100	104	11	89
2014	0	0	0	115	15	85	115	2	98	115	13	87	115	30	70	115	12	88	115	0	100	115	4	96
2013	0	0	0	110	15	85	110	6	94	110	18	82	110	33	67	110	11	89	110	0	100	110	7	93
Total	104	12	88	329	16	84	329	3	97	329	14	86	329	29	71	329	12	88	329	0	100	329	7	93

*1 indicates that a company complies with the specific sustainability guidelines.
**0 indicates that a company does not comply with the specific sustainability guidelines.

Table 2. Overview number of observations external assurance and external assurance guidelines for total sample per year

	External Assurance			AA1000AS			ISAE3000			Assurance standard national (general)			Assurance standard national (sustainability)		
Year	Obs.	1* (%)	0** (%)	Obs.	1*** (%)	0**** (%)	Obs.	1*** (%)	0**** (%)	Obs.	1*** (%)	0**** (%)	Obs.	1*** (%)	0**** (%)
2015	104	58	42	104	0	100	104	9	91	104	24	76	104	9	91
2014	115	44	56	115	2	98	115	8	92	115	10	90	115	15	85
2013	110	48	52	110	1	99	110	4	96	110	22	78	110	32	68
Total	329	50	50	329	1	99	329	7	93	329	18	82	329	19	81

*1 indicates that a company has their sustainability report external assured.
**0 indicates that a company has their sustainability report not external assured.
***1 indicates that a company complies with the specific assurance guidelines.
****0 indicates that a company does not comply with the specific assurance guidelines.

Table 3. Overview number of observations per industry and listing status

	Total	**2013**	**2014**	**2015**
Industry	Obs.	Obs.	Obs.	Obs.
Agriculture	1	0	1	0
Mining	13	4	5	4
Utilities	18	6	6	6
Construction	23	8	8	7
Manufacturing	66	23	23	20
Wholesale trade	20	6	8	6
Retail trade	12	4	4	4
Transportation and warehousing	15	5	5	5
Information	14	5	5	4
Finance and insurance	59	20	19	20
Real estate rental and leasing	8	3	3	2
Professional, scientific, and technical services	35	11	12	12
Management of companies and enterprises	6	2	2	2
Administrative, support, waste management, and remediation services	18	5	6	7
Educational services	0	0	0	0
Health care and social assistance	2	1	1	0
Arts, entertainment, and recreation	3	1	1	1
Accommodation and food services	5	2	2	1
Other services	11	4	4	3
Public administration	0	0	0	0
Total	329	110	115	104
Listed or unlisted companies				
Listed	132	45	46	41
Unlisted	197	65	69	63
Total	329	110	115	104

3.2 Measurement of variables

3.2.1 Dependent variable

The dependent variable of this study is corporate sustainability reporting (CSR) quality. This is measured using data of the GRI Sustainability Disclosure Database. This database indicates whether the sustainability reports comply to different sustainability and external assurance guidelines (GRI, 2017). GRI sets criteria for the sustainability reports published by companies. These criteria relate to some universal standards, like general disclosures and the management approach, but also to topic-specific standards, which include environmental, social and economic standards (GRI, 2016). All these guidelines are used to measure CSR quality, because if a report complies to multiple different guidelines it is considered to be of higher quality than if it complies to only one guideline. The different guidelines all indicate that the report contains more extensive information regarding the social, environmental and ethical activities of a company. The sustainability guidelines used in this study are: SDGs, CDP, IFC, OECD, UNGC, ISO 26000, AA1000 and Stakeholder panel/expert opinion (GRI, 2017). Furthermore, external assurance standards are included as it is assumed that external assurance increases CSR quality, because it shows the desire of the company to improve the credibility of the disclosed information and its sustainability reputation. So when the company has external assurance, and also complies with the external assurance guidelines, it is expected to have higher CSR quality (Simnett et al., 2009). In the next section the different guidelines will be explained. Dummy variables are used to indicate whether a report of a company complies with a guideline. The dummy has value 1 when the report complies to the guideline, and value 0 otherwise. As there are a lot of different guidelines used, which leads to much dependent variables, principal component analysis (PCA) is used to reduce the amount of dependent variables to several components.

In addition, scope quantification is used for sensitivity analysis. This includes the company's use of energy, emission of carbon dioxide, waste, and water consumption (Hammond & Miles, 2004). The use of energy is measured by the amount of gigajoules the company uses in a year, the emission of carbon dioxide is measured by the amount of carbon dioxide in tons the company produces in a year, the waste is measured by the amount of waste in tons the company produces in a year, and water consumption is measured by the amount of water in cubic meters the company consumes in a year. This data is obtained from Asset4, and if not available there, from the company's sustainability or annual report.

3.2.1.1 SDGs

SDGs indicates whether there is an explicit reference in the report to the UN Sustainability Development Goals (GRI, 2017). This are seventeen goals set by the United Nations, with the aim to end poverty, ensure prosperity for all and to protect the planet. The goals are part of a new

sustainability development agenda and each goal consists of some specific targets, which need to be achieved in the upcoming 15 years (United Nations, n.d.).

3.2.1.2 CDP

CDP indicates whether there is an explicit reference in the report that the company is responding to one of the annual Carbon Disclosure Project (CDP) questionnaires, or that the company is participating in a CDP project (GRI, 2017). The CDP focuses on building a sustainable economy, they let companies, cities and investors understand and measure the environmental impact they have. They focus on making companies aware of their carbon and climate change risk, letting companies reduce and disclose their environmental impact by using the power that customers and investors have, and addresses the exposure of companies to deforestation risks by examining greenhouse gas emissions. The CDP programs relate to climate change, water and forests and help companies to submit the data to the investors (CDP, n.d.).

3.2.1.3 IFC

IFC indicates whether there is an explicit reference in the report to the International Finance Corporation Performance standards (GRI, 2017). These IFC Performance standards relate to the responsibilities of companies to manage their social and environmental risks (International Finance Corporation, n.d.). There are eight Performance standards, which relate to environmental and social risks and impacts, working conditions, pollution prevention, community health, land acquisition, biodiversity, indigenous peoples, and cultural heritage (International Finance Corporation, 2012).

3.2.1.4 OECD

OECD indicates whether there is an explicit reference in the report to the OECD Guidelines for Multinational Enterprises (GRI, 2017). These guidelines are recommended by governments of different countries to multinational enterprises, which operate in these countries. The guidelines are non-binding and focus on responsible business conduct (OECD, n.d.). The guidelines relate to general policies, disclosures, employment and industrial relations, human rights, the environment, combating bribe solicitation, bribery and extortion, consumer interests, competition, taxation and science, and technology (OECD, 2011).

3.2.1.5 UNGC

UNGC indicates whether there is an explicit reference in the report to the United Nations Global Compact and its related principles (GRI, 2017). When companies incorporate the Global Compact principles into their strategies, procedures, and policies, they will uphold their responsibilities to the people and the planet, but will also achieve long-term success. The Global Compact consists of 10 principles, which are related to human rights, labor, the environment, and anti-corruption (United Nations Global Compact, n.d.).

3.2.1.6 ISO 26000

ISO 26000 indicates whether there is an explicit reference in the report to ISO 26000 (GRI, 2017). ISO 26000 is officially named as “Guidance on Social Responsibility”. It is an international guideline for the determination of the responsibilities the company has to society, the implementation of a social responsibility strategy, the involvement of stakeholders, and to enhance the credibility of the information of the company related to its social responsibility (CSR Academy, n.d.). The most important part indicates that a company should discuss with the surrounding stakeholders their social and environmental responsibilities (MVO Nederland, 2015). There are seven principles which should be the main focus of the company when making a sustainability decision: accountability, transparency, ethical behavior, accordance with the interests of stakeholders, accordance with law, accordance with international standards of conduct, and accordance with human rights (MVO Nederland, 2014).

3.2.1.7 AA1000

AA1000 indicates whether there is an explicit reference in the report to the AccountAbility standards (GRI, 2017). AccountAbility works with different organizations to advance business responsibilities and set standards for sustainability. The AA1000 standards are principles-based and demonstrate leadership in sustainability. The standards are used to prioritize, identify, measure and respond to the challenges related to sustainability (AccountAbility, n.d.).

3.2.1.8 Stakeholder panel/expert opinion

The stakeholder panel/expert opinion indicates whether there is a formalized feedback or input provided by an expert or stakeholder in the report (GRI, 2017).

3.2.1.9 External assurance

External assurance indicates whether there is mentioned in the report that it is assured by an external assurer. This third party, the external assurer, could be either an accountant, an engineering firm or a small consultancy firm (GRI, 2017).

3.2.1.10 AA1000AS

The AA1000AS indicates whether there is an explicit reference in the external assurance statement to the AccountAbility AA1000 Assurance Standard (GRI, 2017). The AA1000AS is used by sustainability professionals to evaluate the extent and the nature to which a company, which asked for an assurance engagement, adheres to the AccountAbility Principles (AccountAbility, n.d.).

3.2.1.11 ISAE3000

The ISAE3000 indicates whether there is an explicit reference in the external assurance statement to the International Standard on Assurance Engagements 3000 (GRI, 2017). The purpose of these principles is to provide guidance to the professional accountants for the assurance engagements not related to reviews of historical financial information or audits. The focus is on reducing the assurance

engagement risk. The principles relate to ethics, quality control, engagement acceptance, agreeing on terms of the engagement, planning of the engagement, using the work of an expert, obtaining evidence for the engagement, considering events, documentations, preparing the assurance report, and other reporting responsibilities (IFAC, n.d.).

3.2.1.12 Assurance standard: national standard (general)

The general national assurance standard indicates whether there is an explicit reference in the external assurance statement to a general national assurance standard. The general national assurance standard is a general accounting principle, which is developed by an organization or on a national level with a specific national context (GRI, 2017).

3.2.1.13 Assurance standard: national standard (sustainability)

The sustainability national assurance standard indicates whether there is an explicit reference in the external assurance statement to a sustainability specific national assurance standard. The sustainability national assurance standard is non-financial and developed by an organization or on a national level with a specific national context (GRI, 2017).

3.2.2 Principal component analysis

Principal component analysis (PCA) is used to reduce the number of the different dependent variables to the principal components. With these components the rest of the analyses are performed. There is only data on the SDGs guideline for 2015, therefore this guideline is not included in the PCA. Also the AccountAbility Standards guideline (AA1000) is excluded from the PCA, as all reports do not adhere to this guideline and it therefore shows no variance. Furthermore, the PCA is performed once on all the dependent variables, so including both sustainability and external assurance guidelines, and once on only the sustainability guidelines. This is done for the analysis, as the regressions can be performed one time including the external assurance guidelines and one time excluding the external assurance guidelines. Then, a Kaiser-Meyer-Olkin (KMO) test is performed for the different PCA's to examine whether the data suits PCA. Both the data including the external assurance guidelines and excluding the external assurance guidelines are suited for PCA, as the KMO test has in both cases values between 0.5 and 1.0 (Stata, 2017a). When the PCA is performed, there are screeplots made of the mean and the confidence intervals. Based on these screeplots the amount of components is determined. For the PCA including the sustainability and external assurance guidelines, there are three components chosen. There are four components above the mean, but the fourth component is not included as the confidence interval is very small. For the PCA including only the sustainability guidelines, there are two components chosen. Two of the components are above the mean, and the third is slightly below. When looking at the confidence intervals, the confidence interval is small for the third component, therefore only the first two are taken into account. Table 5 shows the

components for the sustainability and external assurance guidelines together. Table 6 shows the components for only the sustainability guidelines[4].

Table 5. PCA including sustainability and external assurance guidelines

	Kaiser-Meyer-Olkin test:		*0.7144*
Variables	**Component 1** ***Sustainability Guidelines***	**Component 2** ***National external assurance***	**Component 3** ***International external assurance guidelines***
Carbon Disclosure Project	**0.3903**	0.2966	-0.1988
International Finance Corporation	0.2822	**0.3871**	-0.0402
OECD Guidelines	**0.3837**	0.2991	0.0091
United Nations Global Compact	**0.3557**	0.1196	-0.2697
ISO26000	0.1917	0.2747	**0.3831**
Stakeholder panel/expert opinion	0.1305	-0.0514	**-0.2942**
External assurance	**0.3962**	-0.3792	0.0792
AccountAbility AA1000 Assurance Standard	0.0716	-0.0207	**0.7329**
International Standard on Assurance Engagements 3000	0.2471	0.0024	**0.3278**
Assurance standard: national (general)	0.2438	**-0.5560**	-0.0342
Assurance standard: national (sustainability)	**0.3973**	-0.3564	-0.0256

Table 6. PCA including only sustainability guidelines

	Kaiser-Meyer-Olkin test:	*0.6931*
Variables	**Component 1** ***Society sustainability guidelines***	**Component 2** ***Company sustainability guidelines***
Carbon Disclosure Project	**0.5168**	-0.0781
International Finance Corporation	**0.4335**	-0.1063
OECD Guidelines	**0.5091**	-0.1230
United Nations Global Compact	**0.4190**	-0.3200
ISO26000	0.2967	**0.5956**
Stakeholder panel/expert opinion	0.1490	**0.7144**

For the first PCA, the one including sustainability and external assurance guidelines, component 1 represents the applicability of the sustainability guidelines. The Carbon Disclosure Project, OECD Guidelines, and United Nations Global Compact have the highest value for component 1, and the International Finance Corporation, ISO26000 and Stakeholder panel/expert opinion almost have the highest value for component 1. Accordingly, component 1 is the best component to represent the 'Sustainability guidelines'. Component 2 represents the applicability of external assurance and the

[4] The components are calculated in STATA by using the standardized values of the different variables. These values are multiplied by the corresponding value of the component. For the PCA including both external assurance and sustainability guidelines this results in 3 dependent variables (components), and for the PCA including only sustainability guidelines this results in 2 dependent variables (components).

national external assurance guidelines. Assurance standard: national (general) has the highest value for component 2, and for Assurance standard: national (sustainability), and external assurance, component 2 has almost the highest value. Thus, component 2 represents 'National external assurance'. Component 3 has the highest values on AccountAbility AA1000 Assurance Standard and International Standards on Assurance Engagements 3000, and represents the 'International external assurance guidelines'. For the second PCA, the one including only sustainability guidelines, component 1 represents the applicability of the Carbon Disclosure Project, International Finance Corporation, OECD guidelines, and United Nations Global Compact. These guidelines all focus on the effect of the company on its environment and the society in which it lives. While for component 2, with the highest value on ISO 26000 and Stakeholder panel/expert opinion, the focus is on how to implement corporate social responsibility in the company's management system and getting feedback or input from a stakeholder or expert (GRI, 2017; Boston College: Center for Corporate Citizenship, 2011). Hence, component 1 is called 'Society sustainability guidelines' and component 2 is called 'Company sustainability guidelines'. However, both PCA's indicate that there is no uniform component for sustainability or for external assurance. For that reason, there will be an additional analysis performed for all dependent variables separated. In addition, the PCA's are estimated again including SDGs for 2015 for sensitivity analysis. SDGs has also the highest value on the component 'Sustainability guidelines', when examining both sustainability and external assurance guidelines, and has also the highest value on the component 'Society sustainability guidelines', when examining only the sustainability guidelines.

3.2.3 Independent variables

3.2.3.1 Board expertise

Board expertise is measured by using the presence of a CSR committee or a director on the board who is in charge of corporate sustainability. This committee or expert has a lot of skills, experience, and knowledge regarding corporate social responsibility, which indicates the board's sustainability expertise. When the board has a CSR committee or a director in charge of sustainability, it is more likely to provide high quality CSR due to the higher expertise. The expertise leads to a higher monitoring capability of the committee, which improves the range of disclosures related to sustainability. A CSR committee is also likely to use their knowledge, experience, and skills to ensure that corporate sustainability is ingrained in the strategy of the company and that this strategy is translated into actions. The CSR committee ensures the quality of CSR, so it is faced as a device to attempt to comply with the expectations of society (Amran et al., 2014; Michelon & Parbonetti, 2012). The variable is included as a dummy, with the value 1 in the presence of a CSR committee or a director on the board who is in charge of corporate sustainability, and value 0 otherwise (Michelon & Parbonetti, 2012; Amran et al., 2014). The data is obtained from the reports in the Disclosure Database of the GRI. This database contains the sustainability reports and annual reports from the

companies. If the database does not include these reports, company.info or the company's website is used. It is examined whether any of the reports or websites mentions that there is a CSR committee or a CSR expert on the board.

3.2.3.2 Interlocking directorates

Interlocking directorates indicate whether one or more directors serve also on the board of other companies. This increases the knowledge of the director, as he/she also has access to the CSR of the other company and can imitate the other company (Ajagbe et al., 2009). The variable is included as a dummy, with the value 1 in the presence of interlocking directorates and value 0 otherwise (Cai & Sevilir, 2012; Ishii & Xuan, 2014). The data is obtained from Orbis. Orbis contains information on the current provisions of the directors. When Orbis does not contain the information needed, BoardEx is used. BoardEx shows the interlocking directorates for all board members.

3.2.3.3 Board independence

Board independence is measured using two different variables. The first one is CEO duality, which indicates whether the CEO is also the chairperson of the board or not. When the CEO is also the chairperson of the board, the independence of the board is reduced. CEO duality might influence the objectivity of the board as a monitoring device for management, as the CEO-chairman sets the agenda, controls board meetings, and may hide critical information for the other directors on the board. The CEO-chairman can also use sustainability for his own moral and power (Jizi et al., 2014). CEO duality is measured using a dummy variable, which has the value 1 in case of no CEO duality, and value 0 otherwise. The second measure used is independence, which is the proportion of independent directors on the board. These independent directors are considered to aim for more transparency regarding sustainability, and to be more effective in controlling management, which increases CSR quality. Independence is calculated by dividing the total number of independent directors on the board by the total number of directors on the board (Cheng & Courtenay, 2006; Jizi, 2017). The data for these variables is obtained from BoardEx, ThomsonOne, and Orbis. These databases indicate the role of a person on the board. The databases also show if it is a non-independent or independent director. When the databases do not contain the data, the annual reports, sustainability reports, and websites of the companies are used to obtain the data. In addition, a dummy variable on the median value of independence is used for additional analyses. It might be that a certain proportion of independent board members on the board is needed to provide more transparency regarding sustainability and to be more effective in controlling management. To examine this possibility, the median value of independence is calculated and a dummy variable is created which equals 1 if the proportion of independent directors is higher than the median of the total sample, and 0 otherwise.

3.2.3.4 Board diversity

Board diversity is measured using two different variables. The first one is gender-diversity, which is the proportion of female directors on the board. Female directors are more sensitive to sustainability issues, and want to improve the image of the company in the community, which will enhance CSR quality (Campbell & Mínquiz-Vera, 2007). Furthermore, it is argued that females often possess a monitoring position on the board, which promotes the board attendance and demands a higher accountability from managers for the performance of the company (Gul, Srinidhi & Ng, 2011). Boards with more females are more inclined with sustainability, as they provide more charitable contributions, and engage in more social welfare activities and environmental involvements (Johnson & Greening, 1999; Williams, 2003). Gender-diversity is calculated by dividing the total number of female directors on the board by the total number of directors on the board (Amran et al., 2014). The second measure used is race-diversity, which is the proportion of Africans, Asians and/or Hispanics on the board. Different races on the board increase the different perspectives on the board, which increases the decision-making related to corporate sustainability on the board, and increases innovation and creativity related to sustainability (Carter, Simkins & Simpson, 2003; Richard, 2000). As the different backgrounds provide more knowledge and experiences to the board, the information base will be broader, which increases the knowledge related to corporate sustainability on the board (Carter et al., 2003). Race-diversity is calculated by dividing the total number of African, Asian, and/or Hispanic directors on the board by the total number of directors on the board (Erhardt, Werbel & Shrader, 2003). The data for gender-diversity is obtained from ThomsonOne and Orbis. These databases contain the directors of the companies and indicate whether the board members are men or women. The data for race-diversity is obtained from Orbis. Orbis indicates the nationality of the board members of a company. When there was no data on gender-diversity or race-diversity in either ThomsonOne or Orbis, annual reports, sustainability reports and the websites of the companies were used to obtain the data. In addition, a dummy variable on gender-diversity is used for sensitivity analysis. It is examined whether there are three or more women on the board, as it is argued that this is a kind of 'critical mass', otherwise the influence of the women will be minimal. A dummy is included with value 1 in case there are three or more women on the board, and value 0 otherwise (Konrad, Kramer & Erkut, 2008).

3.2.4 Control variables

3.2.4.1 External assurance

For one part of the analyses, external assurance and external assurance guidelines are taken into account in the components for CSR quality. On the other part of the analyses, external assurance is used as a control variable. Companies that want to enhance their environmental reputation and the credibility of their reports are more likely to have external assurance on their corporate sustainability reports. The assurance on sustainability reports can reduce the agency costs for the company, because it is more transparent how the companies perform regarding their social, ethical and environmental

issues (Simnett et al., 2009). This indicates that companies that externally assure their sustainability reports, are more likely to provide high quality CSR. External assurance indicates whether it is mentioned in the sustainability report that it is externally assured. The external assurer could be either an accountant, an engineering firm, or a small consultancy firm (GRI, 2017). Accordingly, a positive relation is expected between external assurance and CSR quality. External assurance has the value 1 if the sustainability report is externally assured, and value 0 otherwise (Simnett et al., 2009). The data on external assurance is obtained from the GRI Disclosure Database.

3.2.4.2 Company size

Larger companies are more likely to meet the demands of different stakeholder groups. They are more pressured by the different stakeholder groups, because they are more exposed to public scrutiny than smaller companies. These companies are more likely to spend more money on corporate sustainability to improve CSR quality, as they have a larger impact on society and have a higher visibility. Accordingly, a positive relation is expected between company size and CSR quality. Company size is measured using the logarithm of the book value of total assets (Barnea & Rubin, 2010).

3.2.4.3 Company leverage

Companies with higher leverage need more funds to pay off their debts, and therefore have fewer funds available to increase CSR quality (Barnea & Rubin, 2010). However, it could also be argued that managers of highly leveraged companies are more likely to disclose information, as there is a higher monitoring by external parties. Thus, the agency costs are higher for companies with higher debt. This indicates that there will be an effect of leverage on CSR quality, but that it is not clear whether this effect will be positive or negative. Leverage is measured by dividing total debt by total assets (Clarkson et al., 2008).

3.2.4.4 Company financial performance

Companies with a higher financial performance have more resources available to spend on corporate sustainability and do not have concerns about financial distress, thereby they are more active in improving CSR quality. Accordingly, a positive relation is expected between company financial performance and CSR quality. Company financial performance is measured using return on assets (Jizi et al., 2014). Return on assets is calculated by: *'Net Income before Preferred Dividends + ((Interest Expense on Debt – Interest Capitalized) * (1-tax rate)) / Last Year's Total Assets *100'* (Thomson Reuters, 2017). In addition, return on equity is used for sensitivity analysis. Return on equity is calculated by: *'Net income before Preferred Dividends – Preferred Dividend Requirement) / Last Year's Common Equity * 100'* (Thomson Reuters, 2017). Furthermore, a loss dummy is used for sensitivity analysis. The dummy has value 1 in case of a net loss and value 0 otherwise (Hay, Knechel & Wong, 2006).

3.2.4.5 Industry

Companies operating in an industry with a highly environmental, social or ethical impact are more likely to provide high quality CSR, as these companies operate in a sensitive industry and want to have a good corporate image. By providing high quality CSR, they legitimize their operations. Accordingly, a positive relation is expected between company industry and CSR quality (Chan et al., 2014). Industry is measured by using a dummy on the different industries based on the NAICS codes, which are obtained from Orbis. In addition, a dummy on sensitive industries is used for sensitivity analysis. This is based on the study of Simnett et al. (2009), who indicate that the mining, utilities, production, and finance industries are more exposed to social and environmental risk than the other industries. These companies need to enhance the user confidence and credibility of their sustainability reports, and will thereby provide higher quality CSR. A dummy variable is created which equals 1 if a company is operation in one of these four industries, and equals 0 otherwise.

3.2.4.6 Listing status

Listed companies are more pressured by stakeholders and are often more regulated by government and other institutions. This makes it likely that listed companies respond to the demand for more information by increasing their CSR quality. Accordingly, a positive relation is expected between listing status and CSR quality. Listing status is measured by using a dummy variable with value 1 in case of a listed company, and value 0 otherwise (Michelon & Parbonetti, 2012).

3.2.4.7 Media attention

The media attention of a company may increase the willingness of the company to provide more in-depth disclosure to increase the reputation or to mitigate the reputational risks, which can be due to bad media attention. Furthermore, the company can also use in-depth disclosure to exploit the benefits of good media attention (Hahn & Kühnen, 2013). Good media attention can provide the benefit that any information released by the company is quickly distributed to the market at low costs (Cormier & Magnan, 2003). Accordingly, a positive relation is expected between media attention and CSR quality. Media attention is measured by counting the number of news articles of a company for a particular year in the database of het Financieel Dagblad, as this is the most elaborate financial news publication site and newspaper of the Netherlands (Hahn & Kühnen, 2013; Cormier, Gordon & Magnan, 2004).

3.2.4.8 Board size

On the one hand, a higher board size indicates that there is more expertise on the board as there are more different members with different backgrounds. Their different education programs, director nominations, board performance evaluations, and experience all represent the boards capability to provide high quality CSR (Roy, 2008; Guest, 2009). On the other hand, a smaller board size improves the decision-making process on the board, as the board members will be more actively involved in the decision making and monitoring of management. The coordination on the board is better, and the

directors feel more responsible and accountable for their job (Jizi, 2017). This indicates that board size will effect CSR quality, but that it is not clear whether this effect will be positive or negative. Board size is measured by the total number of board members (Jizi, 2017).

3.2.4.9 Board activity

The effect of board activity on CSR quality is unclear, with studies showing both negative and positive effects (Prado-Lorenzo & Garcia-Sanchez, 2010; Xie, Davidson & Dadalt, 2003), and it can be questioned whether board activity will have an effect on CSR quality, with studies finding no significant effect at all (Frias-Aceituno, Rodriguez-Ariza & Garcia-Sanchez, 2013; Karamanou & Vafeas, 2005). Hence, the analyses are performed one time excluding board activity as control variable, and one time including board activity as control variable. Moreover, the interaction effect of board activity with the other board characteristics will be examined, as board activity may have an effect on the relationship between the board characteristics and CSR quality. For example, if a company has a non-active board, the positive effect of the board characteristics on monitoring management might be decreased. Active board members are more likely to participate in discussions, keep themselves available to execute some specific tasks, and apply their skills to perform different board activities. They could increase CSR quality by better monitoring management and providing higher quality information (Zhu, Wang & Bart, 2016). However, an active board could also indicate that there are more problems on the board, and that there are more and longer discussions and tasks due to these problems. This will lead to less efficient decision-making and task performance, which decreases CSR quality, as the board is less capable of monitoring management and providing high quality CSR in such situations (Frias-Aceituno et al., 2013).

Board activity is measured using two different variables. First, the number of board meetings is used. Active boards will have more meetings, which indicates that they devote more time and attention to corporate sustainability. However, more board meetings could also indicate more problems and less efficiency at the board (Prado-Lorenzo & Garcia-Sanchez, 2010; Frias-Aceituno et al., 2013). Thus, the effect of board meetings on CSR quality is unclear. Board meetings is measured by the number of meetings of the board in a financial year (Prado-Lorenzo & Garcia-Sanchez, 2010; Jizi et al., 2014). This data is obtained from the companies' annual report. When the annual report does not contain the information, the company's website and sustainability report are examined. The second measure used is the proportion of old directors on the board. These directors do not have to build a reputation and do not need to prove themselves, which decreases their board activity. However, it might also be that these directors have more experience in monitoring management, and have more experience and knowledge to advice management and handle different situations. This enhances the board's capability of providing high quality CSR, and also increases the efficiency of decision-making of the board (Larcker, Richardson & Tuna, 2007; Kroll, Walters & Wright, 2008). Thus, the effect of the proportion of old directors on the board on CSR quality is unclear. The

proportion of old directors is measured by dividing the total number of directors with age older than 70 by the total number of directors on the board (Larcker et al., 2007). This data is obtained from ThomsonOne and Orbis. These databases show the current and previous directors of the companies and indicate the age and year of birth of the directors. If there was no data available, the company's annual report, sustainability report and website were used. Table 7 shows the definition of the dependent variables, and table 8 shows the definition of the independent and control variables.

Table 7. Definition of dependent variables

Variables	Definition
Dependent variables	
SDGs	SDGs equals 1 if there is a reference in the sustainability report to the UN Sustainability Development Goals, and 0 otherwise.
CDP	CDP equals 1 if the company is responding to the Carbon Disclosure Project questionnaires, and 0 otherwise.
IFC	IFC equals 1 if there is a reference in the sustainability report to the International Finance Corporation Performance Standards, and 0 otherwise.
OECD	OECD equals 1 if there is a reference in the sustainability report to the OECD Guidelines for Multinational Enterprises, and 0 otherwise.
UNGC	UNGC equals 1 if there is a reference in the sustainability report to the United Nations Global Compact, and 0 otherwise.
ISO26000	ISO26000 equals 1 if there is a reference in the sustainability report to the ISO 26000, and 0 otherwise.
AA1000	AA1000 equals 1 if there is a reference in the sustainability report to the AccountAbility standards, and 0 otherwise.
Stakeholder panel/expert opinion	Stakeholder panel/expert opinion equals 1 if there was formalized feedback or input provided by an expert or stakeholder to the sustainability report, and 0 otherwise.
External assurance	External assurance equals 1 if the sustainability report is external assured, and 0 otherwise.
AA1000AS	AA1000AS equals 1 if there is a reference in the external assurance statement to the AccountAbility AA1000 Assurance Standard, and 0 otherwise.
ISAE3000	ISAE3000 equals 1 if there is a reference in the external assurance statement to the International Standard on Assurance Engagements 3000, and 0 otherwise.
Assurance standard: national (general)	Assurance standard: national (general) equals 1 if there is a reference in the external assurance statement to a general national assurance standard, and 0 otherwise.
Assurance standard: national (sustainability)	Assurance standard: national (sustainability) equals 1 if there is a reference in the external assurance statement to a sustainability specific national assurance standard, and 0 otherwise.
CSR Quality	**CSR Quality is measured twice. First, using three components based on all the dependent variables, related to both sustainability and external assurance guidelines. Second, using two components based on the dependent variables related to the sustainability guidelines.[5]**
Energy use	The use of energy is measured by the amount of gigajoules the company uses in a year.
Carbon dioxide emission	The emission of carbon dioxide is measured by the amount of carbon dioxide in tons the company produces in a year.
Waste	The waste is measured by the amount of waste in tons the company produces in a year.
Water consumption	Water consumption is measured by the amount of water in cubic meters the company consumes in a year.

[5] These dependent variables related to sustainability guidelines are: SGDs, CDP, IFC, OECD, UNGC, ISO26000, AA1000, and Stakeholder panel/expert opinion.

Table 8. Definition of independent and control variables

Variables	Definition	
Independent variables		*Exp. Sign*
Presence CSR committee/expert	Presence CSR committee/expert equals 1 if there is a CSR committee or expert on the board, and 0 otherwise (Amran et al., 2014)	+
Interlocking directorates	Interlocking directorates equals 1 if there are directors on the board who are also on the board of other companies, and 0 otherwise (Cai & Sevilir, 2012; Ishii & Xuan, 2014).	+
CEO Duality	CEO Duality equals 1 if the CEO of the company is not the chairperson of the board, and 0 otherwise (Jizi et al., 2014).	-/-
Independence	Independence is the proportion of independent directors on the board. This is calculated by dividing the total number of independent directors on the board by the total number of directors on the board (Jizi, 2017). For additional analyses, independence equals 1 if the board contains a higher proportion of independent board members than the median proportion of independent board members of the total sample, and 0 otherwise.	+
Gender-diversity	Gender-diversity indicates the proportion of female directors on the board. This is calculated by dividing the total number of females on the board by the total number of directors on the board (Amran et al., 2014). For sensitivity analysis, gender-diversity equals 1 if there are three women or more on the board, and 0 otherwise (Konrad et al., 2008).	+
Race-diversity	Race-diversity indicates the proportion of African, Asian, and/or Hispanic directors on the board. This is calculated by dividing the total number of African, Asian, and/or Hispanic directors on the board by the total number of directors on the board (Erhardt et al., 2003).	+
Control variables		
Company size	Company size is calculated as the logarithm of the book value of total assets of the company (Barnea & Rubin, 2010).	+
Company leverage	Company leverage is measured by dividing total debt by total assets (Clarkson et al., 2008).	?
Company financial performance	Company financial performance is measured using return on assets. Return on assets is calculated by: *'Net Income before Preferred Dividends + ((Interest Expense on Debt – Interest Capitalized) * (1-tax rate)) / Last Year's Total Assets *100'* (Thomson Reuters, 2017). For sensitivity analysis, firm financial performance is measured using return on equity. Return on equity is calculated by: *'Net income before Preferred Dividends – Preferred Dividend Requirement) / Last Year's Common Equity * 100'* (Thomson Reuters, 2017). Company financial performance is also measured, for sensitivity analysis, using a loss dummy. This dummy equals 1 in case of a net loss, and 0 otherwise (Hay et al., 2006).	+
Listing status	Listing status equals 1 in case of a listed company, and 0 otherwise (Michelon & Parbonetti, 2012).	+
Media attention	Media attention is measured by counting the number of articles of a particular year in the database of het Financieel Dagblad.	+
Industry	Industry is a dummy variable based on the NAICS. It consists of 19 different industry groups, which are all included in the analysis[6]. For sensitivity analysis, industry equals 1 if the company operates in a sensitive industry (mining, production, utilities, or financing), and 0 otherwise (Simnett et al., 2009).	?
External assurance	External assurance equals 1 if the sustainability report is externally assured, and 0 otherwise (Simnett et al., 2009).	+
Board size	Board size indicates the number of directors on the board (Jizi, 2017).	?
Old directors	Old directors indicates the proportion of old directors on the board. This is calculated by dividing the total number of directors with age 70 or older by the total number of directors on the board (Larcker et al., 2007).	?
Board meetings	Board meetings indicate the number of meetings of the board in a particular financial year (Prado-Lorenzo & Garcia-Sanchez, 2010).	?

[6] Industry group 1 is for agriculture, 2 for mining, 3 for utilities, 4 for construction, 5 for manufacturing, 6 for wholesale trade, 7 for retail trade, 8 for transportation and warehousing, 9 for information, 10 for finance and insurance, 11 for real estate rental and leasing, 12 for professional, scientific and technical services, 13 for management of companies and enterprises, 14 for administrative, support, waste management, and remediation services, 15 for educational services, 16 for health care and social assistance, 17 for arts, entertainment, and recreation, 18 for accommodation and food services, 19 for other services, and 20 for public administration.

3.3 Model

The data obtained in this study can be identified as panel data, and the hypotheses are tested by using a panel data regression model. First, there is a distinction made between a pooled regression and fixed effect model. When the fixed effect model is significant and better suited than the pooled regression, a Hausman test is performed to examine whether a fixed effect or random effect model should be used. A random-effect model threats the company effect as varying over time, while the fixed effect model threats the company effect as constant over time. The fixed-effect model is a special case of the random effect model, as the random effect model is a more generalizable model (Francis, 2011). Before the regressions are performed, the correlation matrixes are provided. Table 8 presents the Pearson correlation matrix for the model with the dependent variables both including the sustainability and external assurance guidelines, but not including the control variables on board activity. Table 9 presents the Pearson correlation matrix for the model with the dependent variables only including the sustainability guidelines, and external assurance as control variable, but not including the control variables on board activity. In both cases, there are no correlations found with a value higher than 0.6, which indicates that there is no collinearity in the sample (Studenmund, 2014). This is also supported by the Spearman correlations and the variance inflation factor (VIF). The VIF in the model estimations are all less than 2.01 and the VIF has a mean of 1.42, all below the threshold of 10 (O'brien, 2007). Appendix 1 provides the Pearson correlation matrix for the model with the dependent variables both including the sustainability and external assurance guidelines, and including the control variables on board activity. Appendix 2 provides the Pearson correlation matrix for the model with the dependent variables only on the sustainability guidelines, external assurance as control variable, and the control variables on board activity. In both cases, there are also no correlations found with a value higher than 0.6, which indicates that there is no collinearity in the sample (Studenmund, 2014). This is also supported by the Spearman correlations and the variance inflation factor. The VIF in the model estimations are all less than 2.04 and the VIF has a mean of 1.41, all below the threshold of 10 (O'brien, 2007).

To test the hypotheses, two different models are used. The first model has CSR quality as dependent variable, and includes both sustainability and external assurance guidelines. For this model, to support H1 up to and including H4, the dependent variable CSRQA should be higher for companies having a higher board expertise, having interlocking directorates, having a higher board independence, and having a higher board diversity than companies who do not have this, after controlling for company size, company leverage, company financial performance, media attention, listing status, board size, industry, and year. To support H5, there should be positive effects of the combination of board characteristics on CSR quality, after controlling for company size, company leverage, company financial performance, media attention, listing status, board size, industry, and year. The second model also has CSR quality as dependent variable, but now only including the sustainability guidelines. Furthermore, external assurance is now included as control variable. For this

model, to support H1 up to and including H4, the dependent variable CSRQ should be higher for companies having a higher board expertise, having interlocking directorates, having a higher board independence, and having a higher board diversity than companies who do not have this, after controlling for company size, company leverage, company financial performance, media attention, listing status, board size, industry, year, and external assurance. To support H5, there should be positive effects of the combination of board characteristics on CSR quality, after controlling for company size, company leverage, company financial performance, media attention, listing status, board size, industry, year, and external assurance. Both models are performed twice, one time including the control variables on board activity, and one time excluding the control variables on board activity.

The first panel data regression model is used three times for the three different components created from the PCA. Then the Hausman test is performed per component, and when the fixed effect model is used, the industry control is not taken into account as this is 'fixed'. This also is the case for model 2, as it is used two times for the components created from the PCA. Then the Hausman test is also performed per component, and when the fixed effect model is sued, the industry control is not taken into account as it is 'fixed'. The first panel data regression model used is:

$$CSRQA_i = \beta_0 + \beta_1 BOARD\ COMPOSITION_i + \beta_2 INTERACTION\ BOARD\ COMPOSITION_i + \beta_3 COMPANY_{control,i} + \beta_4 INDUSTRY_{control,i} + \beta_5 YEAR_{control,i} + \varepsilon_i$$

The second panel data regression model used is:

$$CSRQ_i = \beta_0 + \beta_1 BOARD\ COMPOSITION_i + \beta_2 INTERACTION\ BOARD\ COMPOSITION_i + \beta_3 COMPANY_{control,i} + \beta_4 INDUSTRY_{control,i} + \beta_5 YEAR_{control,i} + \beta_6 EXTERNAL\ ASSURANCE_i + \varepsilon_i$$

CSRQA indicates CSR quality, which is measured using the three components derived from PCA including the sustainability and external assurance guidelines, and CSRQ indicates CSR quality, which is measured using the two components derived from PCA including only the sustainability guidelines. BOARD COMPOSITION represents the variables presence of a CSR committee/expert, interlocking directorates, CEO duality, independence, gender-diversity and race-diversity on the board. The INTERACTION BOARD COMPOSITION represents the different interaction terms, which are derived by multiplying all different board characteristics with each other. This results in 15 interactions[7]. The COMPANY controls used in this study are company size, company leverage,

[7] These interaction effects are interactions between the presence of a CSR committee or expert and interlocking directorates, the presence of a CSR committee or expert and gender-diversity, the presence of a CSR committee or expert and race-diversity, the presence of a CSR committee or expert and CEO duality, the presence of a CSR committee or expert and independence, interlocking directorates and gender-diversity, interlocking directorates and race-diversity, interlocking directorates and CEO duality, interlocking directorates and independence, gender-diversity and race-diversity, gender-diversity and CEO duality, race-diversity and CEO duality, gender-diversity and independence, race-diversity and independence, and CEO duality and independence.

company financial performance, listing status, board size, and media attention. The models are also examined one time including the company control variables on board activity, which are board meetings and old directors. The INDUSTRY control consists of 19 different industry groups and the YEAR control consists of the three different years (2013-2015). EXTERNAL ASSURANCE represents whether the sustainability report is externally assured or not. Subscript i refers to the company.

Table 8. Pearson Correlation Matrix with dependent variable including both sustainability and external assurance guidelines

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.0000												
2	-0.0000	1.0000											
3	0.0000	0.0000	1.0000										
4	0.2611***	0.0062	0.0071	1.0000									
5	0.1514***	-0.0110	0.0490	0.0023	1.0000								
6	0.1208**	-0.0898	-0.0826	0.0747	0.1314**	1.0000							
7	0.1179**	0.1269**	0.0735	0.1341**	-0.0117	-0.0681	1.0000						
8	0.1470***	-0.0016	0.0707	0.1318**	-0.1115**	-0.0029	0.1165**	1.0000					
9	-0.0157	-0.1835***	0.0140	0.0123	0.3563***	0.0763	-0.1395**	-0.4073***	1.0000				
10	0.3450***	0.1161**	-0.1068*	0.2567***	0.3602***	0.0696	0.1344**	-0.0274	0.2202***	1.0000			
11	0.4394**	0.0019	0.0069	0.2313***	0.3046***	0.1998***	0.1663***	0.0658	0.1132**	0.5554***	1.0000		
12	-0.0213	-0.1866***	-0.0341	0.0175	-0.0558	-0.0491	0.0051	-0.0955*	0.1236**	-0.0300	0.0105	1.0000	
13	0.3196***	0.1629***	-0.1146**	0.2417***	0.0687	-0.0078	0.0372	0.0607	-0.0659	0.4008***	0.2605***	-0.2495***	1.0000
14	-0.0581	0.0224	-0.0382	-0.0796	-0.1251**	-0.0000	-0.0053	0.1147**	-0.2556***	-0.0867	-0.0432	-0.1218**	-0.1331**
15	0.3788***	0.0273	-0.0488	0.2847***	0.3461***	0.2397***	0.1127**	0.0932*	0.1088*	0.5407***	0.5222***	-0.0545	0.3048***
16	-0.1129**	-0.0610	-0.0853	-0.1270**	0.0706	0.1387**	-0.2371***	-0.0602	0.1013*	-0.1010*	-0.2862***	0.0459	-0.2662***

	14	15	16
14	1.0000		
15	-0.0649	1.0000	
16	0.0073	-0.0821	1.0000

*, **, and *** indicate the statistical significance at the 1 percent, 5 percent, and 10 percent level respectively.

Table 9. Pearson Correlation Matrix with dependent variable including only sustainability guidelines and external assurance as control variable

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.0000												
2	0.0000	1.0000											
3	0.2298***	0.1162**	1.0000										
4	0.1226**	-0.0610	0.0023	1.0000									
5	0.0607	-0.0492	0.0747	0.1314**	1.0000								
6	0.1402**	-0.0772	0.1341**	-0.0117	-0.0681	1.0000							
7	0.1174**	0.0505	0.1318**	-0.1115**	-0.0029	0.1165**	1.0000						
8	-0.1265**	-0.1068*	0.0123	0.3563***	0.0763	-0.1395**	-0.4073***	1.0000					
9	0.3495***	-0.1928***	0.2567***	0.3602***	0.0696	0.1344**	-0.0274	0.2202***	1.0000				
10	0.3542***	0.1575***	0.2313***	0.3046***	0.1998***	0.1663**	0.0658	0.1132**	0.5554***	1.0000			
11	-0.1191**	-0.0133	0.0175	-0.0558	-0.0491	0.0051	-0.0955*	0.1236**	-0.0300	0.0105	1.0000		
12	0.3693***	-0.0603	0.2417***	0.0687	-0.0078	0.0372	0.0607	-0.0659	0.4008***	0.2605***	-0.2495***	1.0000	
13	-0.0323	0.1317**	-0.0796	-0.1251**	-0.0000	-0.0053	0.1147**	-0.2556***	-0.0867	-0.0432	-0.1218**	-0.1331**	1.0000
14	0.3273***	-0.1334**	0.2847***	0.3461***	0.2397***	0.1127**	0.0932*	0.1088*	0.5407***	0.5222***	-0.0545	0.3048***	-0.0649
15	-0.1151**	-0.0124	-0.1270**	0.0706	0.1387**	-0.2371***	-0.0602	0.1013*	-0.1010*	-0.2862***	0.0459	-0.2662***	0.0073
16	0.2967***	-0.0067	0.1776***	0.0978*	0.1571***	-0.0113	0.1385**	0.0631	0.1766***	0.3799***	0.1461***	0.0995*	-0.0185

	14	15	16
14	1.0000		
15	-0.0821	1.0000	
16	0.2761***	0.0299	1.0000

*, **, and *** indicate the statistical significance at the 1 percent, 5 percent, and 10 percent level respectively.

4. Results

4.1 Summary statistics

Table 10 shows summary statistics for the dependent, independent, and control variables used in this study, after the observations with missing variables are dropped. The 13 dependent variables on which the components are based, the 6 independent variables on the board composition, the 7 control variables, and the years are included. Regarding the dependent variables, almost half of the reports are externally assured, which is somewhat higher than in the study of Adnan et al. (2010), who find a percentage of 33.82% externally assured reports in their sample. This is probably due to the fact that they focus on other companies and other countries. The AccountAbility Standards guideline shows no variation, and is dropped in further analyses.

Regarding the independent variables, there are outliers found for independence, gender-diversity, and race-diversity[8]. These variables are winsorized at the 1% level, and it is examined whether any transformations will enhance the normal distribution. This is not the case, so the variables are only winsorized. For the presence of a CSR committee/expert a mean of 0.3841 is found, which indicates that in 38.41% of the corporate sustainability reports, there was a CSR committee/expert on the board. This is somewhat lower compared with other studies, who find a mean of 0.66 and 0.71 respectively (Adnan et al., 2010; Amran et al., 2014). For interlocking directorates a mean of 0.7652 is found, which indicates that in 76.5% of the corporate sustainability reports there are one or more interlocking directorates on the board. For CEO duality a mean of 0.6050 is found, which indicates that in 60.50% of the CSR reports, the CEO is not the chairman of the board. This is comparable to other studies, as Jizi (2017) finds a mean of 0.23 and Jizi et al. (2014) find a mean of 0.43 for CEO duality, which indicates that in 77% and 57% of the cases, respectively, the CEO is not the chairman of the board. For independence a mean of 0.5062 is found, which indicates that on average, the board consists of 50.62% independent board members. This is comparable to the study of Jizi (2017) and the study of Amran et al. (2014), who find an average of 54.56% and 50.1% independent board members respectively. However, the average is somewhat lower compared to the study of Jizi et al. (2014), who find a percentage of 81% independent board members. For gender-diversity a mean of 0.1647 is found, which indicates that on average, the board of a company consists of 16.47% female directors. This is somewhat higher compared with the study of Amran et al. (2014) and Jizi (2017), who find an average percentage of 7.8% and 9.25% females on the board, respectively. For race-diversity, a mean of 0.0579 is found, which indicates that on average, the board of a company consists of 5.79% African, Asian, and/or Hispanic directors. Erhardt et al. (2003) find a mean of 0.21, which is quite higher, but this also includes the females on the board. The differences in the mean of the independent variables compared with other studies, are probably due to the fact that

[8] This is examined by using scatterplots, normal probability plots, histograms, and a skewness and kurtosis test for normality.

they focus on the Asian region and on big companies, while this study only focuses on the Netherlands and also takes small companies into account (Jizi, 2017; Jizi et al., 2014; Amran et al., 2014; Adnan et al., 2010).

Regarding the control variables, there are outliers found for company leverage, company financial performance, board size, board meetings, old directors and media attention[9]. These variables are winsorized on a 1% level, and it is examined whether any transformations will enhance the normal distribution. For media attention, board meetings, and board size the log-variable is taken into account in the analysis[10]. For company size a mean of 9.26 is found, which is in line with the study of Jizi (2017), who finds a mean of 9.37. Company leverage has a mean of 0.5038, which is in line with Jizi (2017), who finds a mean of 0.52, and is somewhat lower compared to Jizi et al. (2014), who find a mean of 0.90. For financial performance a mean of 0.0515 is found, which is in line with Jizi (2017), who finds a mean of 0.07, and is somewhat higher compared to Jizi et al. (2014), who find a mean of -0.11. These differences with Jizi et al. (2014) are probably due to the fact that they focus on large US banks, and in this study different industries and Dutch companies of different sizes are taken into account. For listed a mean of 0.4012 is found, which indicates that 40.12% of the sustainability reports is from listed companies. For old directors a mean of 0.0687 is found, which indicates that, on average, the board consists of 6.87% old directors. This is in line with Larcker et al. (2007), who find a percentage of 9.88% on old outsiders, 6.97% on old affiliated, and 1.72% on old insiders. For industry there are 19 different groups used, which all indicate different industries based on the NAICS codes.

[9] This is examined by using scatterplots, normal probability plots, histograms, and a skewness and kurtosis test for normality.

[10] As the log-version of the variable is used in the analysis and summery statistics, it is not possible to compare the summary statistics for this variable with other studies.

Table 10. Summary Statistics

Variable	n	Mean	Std. deviation	Min.	Max.
Year	319	2013.98	0.8067	2013	2015
Dependent variables					
UN Sustainability Development Goals	101	0.1089	0.3131	0	1
Carbon Disclosure Project	319	0.1599	0.3671	0	1
International Finance Corporation	319	0.0313	0.1745	0	1
OECD Guidelines	319	0.1411	0.3486	0	1
United Nations Global Compact	319	0.2853	0.4523	0	1
ISO26000	319	0.1285	0.3352	0	1
AccountAbility Standards	319	0	0	0	0
Stakeholder panel/expert opinion	319	0.0752	0.2642	0	1
External assurance	319	0.5016	0.5008	0	1
AccountAbility AA1000 Assurance Standard	319	0.0094	0.0967	0	1
International Standard on Assurance Engagements 3000	319	0.0690	0.2538	0	1
Assurance standard: national (general)	319	0.1818	0.3863	0	1
Assurance standard: national (sustainability)	319	0.1881	0.3914	0	1
Independent variables					
CSR committee/expert	319	0.3887	0.4882	0	1
Interlocking directorates	319	0.7649	0.4247	0	1
CEO Duality	319	0.3950	0.4896	0	1
Independence	319	0.5071	0.2440	0	0.9231
Gender-diversity	319	0.1622	0.1212	0	0.5
Race-diversity	319	0.0579	0.1021	0	0.5
Control variables					
Company size	319	9.2802	1.189	5.39	12.08
Company leverage	319	0.4963	0.2810	0.021	0.985
Financial performance	319	0.0513	0.1861	-0.2467	1.54
Listed	319	0.4075	0.4921	0	1
Media attention	319	2.224	1.4322	0	5.0999
Board size	319	2.350	0.5271	1.3863	3.4965
Board meetings	319	2.170	0.4559	1.386	3.638
Old directors	319	0.0687	0.1011	0	0.43
Industry	319	8.320	4.191	1	19

Tables 7 and 8 provide definitions of the variables.

4.2 Results

Table 11 shows the results of the effect of board composition on the sustainability and external assurance guidelines components. For the component 'Sustainability guidelines' and the component 'International external assurance guidelines', the Hausman test is not significant ($p > 0.05$), which indicates that the random effect model is best suited in these cases. For the component 'National external assurance', a Hausman test cannot be performed as the asymptotic assumptions were not met. Then the sigmamore option is used, but this still does not provide a result. Thereafter, a Mundlak test is performed, which is not significant, and indicates that a random effect model is appropriate. Both industry- and year dummies are added to the model, and one of the dummies on industry and year are omitted because of multicollinearity reasons. The first column on the component provides the regression without the interaction terms, and the second column of the component provides the regression including the interaction terms. As there is no multicollinearity between the different variables, all interaction terms are added together in the same regression. All interactions between the different variables on the composition of the board are tested, and only the significant interactions are added to the model given the large number of possible interactions. The Bonferroni correction is applied, to adjust the significance level due to the multiple interaction testing. Fifteen interactions are tested, and therefore the critical P-value is reduced to 0.10/15 = 0.0067 (Abdi, 2007).

Table 11 shows the effect of the board composition on CSR quality. For the 'Sustainability guidelines' component, with respect to the variables of interest, independence is negative and significant ($z = -1.77$, $p < 0.10$, two tailed), which rejects H3. No significant effect of CSR committee or expert, interlocking directorates, CEO duality, gender-diversity and race-diversity is found, providing no support for H1, H2, H3, and H4. In the interaction model, the interaction terms interlocking directors and gender diversity ($z = -2.10$, $p < 0.05$, two tailed), and race-diversity and CEO duality ($z = -4.824$, $p < 0.05$, two tailed) are both negative and significant. However, both interaction terms do not remain intact after applying the Bonferroni correction.

For the 'National external assurance' component, with respect to the variables of interest, CSR committee or expert on the board ($z = -1.78$, $p < 0.10$, two tailed) and independence ($z = -2.00$, $p < 0.10$, two tailed) are negative and significant, rejecting H1 and H3. No significant effect of interlocking directorates, CEO duality, gender-diversity, and race-diversity is found, providing no support for H2, H3, and H4. In the interaction model, the interaction term CSR committee or expert on the board and CEO duality is negative and significant ($z = -1.92$, $p < 0.10$, two tailed). In addition, the interaction term CSR committee or expert on the board and independence is positive and significant ($z = 1.99$, $p < 0.05$, two tailed). However, both interaction terms do not remain intact after applying the Bonferroni correction.

For the 'International external assurance guidelines' component, with respect to the variables

Table 11. Analysis of determinants of CSR quality (based on sustainability and external assurance guidelines) related to board composition

Variable	Sustainability Guidelines	Sustainability guidelines	National external assurance	National external assurance	International external assurance guidelines	International external assurance guidelines
CSR committee/expert	0.2764	0.1019	-0.3018*	-0.4658	0.0899	0.0937
	(1.37)	(0.20)	(-1.78)	(-1.12)	(0.59)	(0.26)
Interlocking directorates	0.1311	0.4090	0.0631	0.2086	0.2197	0.1881
	(0.51)	(1.14)	(0.30)	(0.68)	(1.17)	(0.68)
CEO Duality	-0.3711	-0.6920	0.1643	0.2364	0.2404	-0.0928
	(-1.57)	(-1.31)	(0.89)	(0.52)	(0.71)	(-0.23)
Independence	-0.7814*	-1.623**	-0.8113**	-1.373*	-0.3505*	0.7999
	(-1.77)	(-2.00)	(-2.17)	(-1.87)	(-1.93)	(1.16)
Gender-diversity	0.4592	2.981**	-0.0784	1.3659	-0.6775	-1.163
	(0.57)	(1.97)	(-0.12)	(1.01)	(-1.14)	(-0.92)
Race-diversity	0.4486	-2.228	0.4541	0.3406	-0.1457	-3.566*
	(0.42)	(-0.79)	(0.54)	(0.14)	(-0.90)	(-1.70)
Company size	0.2621*	0.3539**	0.0141	-0.0168	0.1564	0.1225
	(1.84)	(2.40)	(0.12)	(-0.14)	(1.57)	(1.14)
Company leverage	0.2161	0.2774	-0.3914	-0.3892	-0.2397	-0.2104
	(0.56)	(0.71)	(-1.32)	(-1.22)	(-0.93)	(-0.77)
Financial performance	-0.2024	-0.1883	0.0012	0.0671	-0.4449	-0.3207
	(-0.35)	(-0.33)	(0.00)	(0.13)	(-0.96)	(-0.67)
Listed	0.7738***	0.8867***	0.0941	0.1545	-0.4119**	-0.3899**
	(2.85)	(3.23)	(0.47)	(0.71)	(-2.40)	(-2.11)
Media attention	0.1248	0.0846	0.0319	0.0407	0.0324	0.0585
	(1.45)	(0.94)	(0.44)	(0.52)	(0.50)	(0.82)
Board size	0.1592	0.0132	0.3787*	0.3930*	-0.3505*	-0.3918**
	(0.62)	(0.05)	(1.84)	(1.81)	(-1.93)	(-2.05)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
CC[1] * CD[2]				-0.6570*		
				(-1.92)		
CC * IN[3]				1.4716**		
				(1.99)		
ID[4] * GD[5]		-3.643**				
		(-2.10)				
ID * RD[6]						3.418*
						(1.73)
RD * CD		-4.824**				
		(-2.04)				
Intercept	-3.332*	-4.516**	-0.0473	0.4006	-0.9850	-0.9600
	(-1.88)	(-2.47)	(-0.03)	(0.26)	(-0.75)	(-0.69)
Wald chi[2]	99.93***	126.22***	59.17***	70.05**	31.43	40.45
N	319	319	319	319	319	319

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent respectively. The values given represent the regression coefficient and the Z-values are provided in brackets.

[1] CC indicates the presence of a CSR committee/expert, [2] CD indicates CEO duality, [3] IN indicates independence, [4] ID indicates interlocking directorates, [5] GD indicates gender-diversity, and [6] RD indicates race-diversity. Tables 7 and 8 provide definitions of the variables.

of interest, independence ($z = -1.93$, $p < 0.10$, two tailed) is negative and significant, which rejects H3. No significant influence of CSR committee or expert, interlocking directorates, CEO duality, gender-diversity, and race-diversity on CSR quality is found, providing no support for H1, H2, H3, and H4. In the interaction model, the interaction term interlocking directorates and race-diversity ($z = 1.73$, $p < 0.10$, two tailed) is positive and significant. However, the interaction term does not remain intact after applying the Bonferroni correction.

Table 12 shows the effect of board composition on CSR quality based on the sustainability and external assurance guidelines, including the control variables on board activity. Also interaction terms are added for the combination of the board characteristics and board activity. For all three components the Hausman test is not significant, indicating that the random effects model is best suited for these cases. Both industry group dummies and year dummies are included, and one of the industry- and year-dummies is omitted because of multicollinearity reasons. The first column on the component in the table provides the regression without the interaction terms, and the second column of the component in the table provides the regression with interaction terms. As there is no multicollinearity between the different variables, all interaction terms are added together in the same regression. All interactions between the different board characteristics and board activity are tested, and only the significant interactions are added to the model given the large number of possible interactions. The Bonferroni correction is also applied for this analysis, to adjust for multiple interaction testing. Now twenty-seven interaction are tested, and the critical P-value is reduced to $0.10/27 = 0.0037$ (Abdi, 2007).

For the 'Sustainability Guidelines' component, with respect to the variables of interest, independence is still negative and significant ($z = -1.65$, $p < 0.10$, two tailed), which rejects H3. Again, no significant effect is found for CSR committee or expert, interlocking directorates, CEO duality, gender-diversity, and race-diversity, providing no support for H1, H2, H3, and H4. In the interaction model, the interaction terms interlocking directorates and gender-diversity ($z = -1.74$, $p < 0.10$, two tailed), and race-diversity and CEO duality ($z = -2.44$, $p < 0.05$, two tailed) are still negative and significant. In addition, the interaction term old directors and race-diversity ($z = -2.18$, $p < 0.05$, two tailed) is now negative and significant, and the interaction term race-diversity and independence ($z = 1.99$, $p < 0.05$, two tailed) is now positive and significant. However, the interaction terms do not remain intact after applying the Bonferroni correction.

For the 'National external assurance' component, with respect to the variables of interest, CSR committee or expert ($z = -1.89$, $p < 0.10$, two tailed) and independence ($z = -1.89$, $p < 0.10$, two tailed) are still negative and significant, rejecting H1 and H3. Again, there are no significant effects found for interlocking directorates, CEO duality, gender-diversity, and race-diversity, providing no support for H2, H3, and H4. In the interaction model, the interaction term CSR committee or expert and CEO duality ($z = -2.31$, $p < 0.05$, two tailed) is still negative and significant, and the interaction term CSR committee or expert and independence ($z = 1.80$, $p < 0.10$, two tailed) is still positive and

Table 12. Analysis of determinants of CSR quality (based on sustainability and external assurance guidelines) related to board composition and board activity

Variable	Sustainability Guidelines	Sustainability guidelines	National external assurance	National external assurance	International external assurance guidelines	International external assurance guidelines
CSR committee/expert	0.2437	0.4909	-0.3204*	0.3474	0.1005	0.2404
	(1.20)	(0.89)	(-1.89)	(0.75)	(0.66)	(0.62)
Interlocking directorates	0.1628	0.0162	0.1349	0.0671	0.1877	0.2492
	(0.63)	(0.03)	(0.63)	(0.16)	(0.98)	(0.67)
CEO Duality	-0.3575	-0.6037	0.1804	0.3257	-0.1524	0.0782
	(-1.50)	(-1.13)	(0.99)	(0.71)	(-0.95)	(0.20)
Independence	-0.7397*	-0.1259	-0.7156*	-1.189	0.2361	-0.0218
	(-1.65)	(-0.12)	(-1.89)	(-1.27)	(0.69)	(-0.03)
Gender-diversity	0.4574	2.558	-0.1172	2.629	-0.7002	1.032
	(0.57)	(1.24)	(-0.18)	(1.45)	(-1.18)	(0.62)
Race-diversity	0.3635	1.608	0.4081	-3.575	0.0465	0.2435
	(0.34)	(0.57)	(0.48)	(-1.51)	(0.06)	(0.12)
Company size	0.2653*	0.3486**	0.0112	-0.0036	0.1501	0.1200
	(1.85)	(2.32)	(0.10)	(-0.03)	(1.50)	(1.14)
Company leverage	0.1979	0.2315	-0.3826	-0.3041	-0.2359	-0.1617
	(0.51)	(0.59)	(-1.30)	(-0.94)	(-0.91)	(-0.62)
Financial performance	-0.2345	-0.1951	-0.0561	-0.1922	-0.4371	-0.2353
	(-0.41)	(-0.33)	(-0.11)	(-0.37)	(-0.94)	(-0.49)
Listed	0.7138***	0.8028***	0.0440	0.1333	-0.3715**	-0.2793
	(2.56)	(2.83)	(0.22)	(0.57)	(-2.14)	(-1.50)
Media attention	0.1181	0.0732	0.0307	0.0512	0.0467	0.0644
	(1.35)	(0.80)	(0.42)	(0.65)	(0.71)	(0.92)
Board size	0.1532	-0.0653	0.3468*	0.2671	-0.3433*	-0.4822**
	(0.59)	(-0.24)	(1.69)	(1.18)	(-1.88)	(-2.52)
Board meetings	0.2538	0.9515	0.2057	0.7228	-0.2126	-0.1808
	(1.16)	(1.55)	(1.17)	(1.36)	(-1.35)	(-0.38)
Old directors	-0.3101	-1.906	-1.030	-0.9858	-0.0616	-0.4144
	(-0.34)	(-0.61)	(-1.31)	(-0.35)	(-0.09)	(-0.15)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
CC[1] * CD[2]				-0.8125**		
				(-2.31)		
CC * IN[3]				1.402*		
				(1.80)		
CC * OD[4]				3.297*		
				(1.91)		
ID[5] * GD[6]		-3.278*				
		(-1.74)				
OD * RD[7]		-29.39**				
		(-2.18)				
RD * CD		-5.888**		3.477*		-3.241*
		(-2.44)		(1.71)		(-1.88)
RD * IN		9.994**				
		(1.99)				
BM[8] * RD						-4.398*
						(-1.92)
OD * GD						11.55*
						(1.75)
Intercept	-3.8851**	-6.599***	-0.4865	-1.874	-0.5078	-0.6968
	(-2.10)	(-3.00)	(-0.33)	(-1.01)	(-0.37)	(-0.43)
Wald chi[2]	99.61***	142.23***	63.67***	93.43**	33.74	73.14
N	319	319	319	319	319	319

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent respectively. The values given represent the regression coefficient and the Z-values are provided in brackets.[1] CC indicates the presence of a CSR committee/expert, [2] CD indicates CEO duality, [3] IN indicates independence, [4] OD indicates old directors, [5] ID indicates interlocking directorates, [6] GD indicates gender-diversity, [7] RD indicates race-diversity, and [8] BM indicates board meetings. Tables 7 and 8 provide definitions of the variables.

significant. In addition, the interaction term CSR committee or expert and old directors ($z = 1.91$, $p < 0.10$, two tailed), and the interaction term race-diversity and CEO duality ($z = 1.71$, $p < 0.10$, two tailed) are now positive and significant. However, the interaction terms do not remain intact after applying the Bonferroni correction.

For the 'International external assurance guidelines' component, with respect to the variables of interest, independence is not significant anymore. None of the independent variables is significant in this case, providing no support for H1, H2, H3, and H4. In the interaction model, the interaction term interlocking directorates and race-diversity is no longer significant. In addition, the interaction terms race-diversity and CEO duality ($z = -1.88$, $p < 0.10$, two tailed), and race-diversity and board meetings ($z = -1.92$, $p < 0.10$, two tailed) are negative and significant now. Furthermore, the interaction term old directors and gender-diversity ($z = 1.75$, $p < 0.10$, two tailed) is now positive and significant. However, the interaction terms do not remain intact after applying the Bonferroni correction.

Table 13 shows the effect of board composition on only the sustainability guidelines components. External assurance is added as a control variable, and board activity is not included. For both the components, 'Society sustainability guidelines' and 'Company sustainability guidelines', the Hausman test is not significant, indicating that the random effect model is best suited in these cases. There is controlled for years and industries in the models, and one of the industry and year dummies is omitted because of multicollinearity. The first column of the component provides the regression without the interaction terms, and the second column of the component provides the regression including the interaction terms. As there is no multicollinearity between the different variables, all interaction terms are added together in the same regression. All interactions between the different variables on the composition of the board are tested, and only the significant interactions are added to the model given the large number of possible interactions. Again, the Bonferroni correction is applied, to adjust the significance level due to the multiple interaction testing. Fifteen interactions are tested, and the critical P-value is reduced to $0.10/15 = 0.0067$ (Abdi, 2007).

For the component 'Society sustainability guidelines', with respect to the variables of interest, independence ($z = -2.47$, $p < 0.05$, two tailed) is negative and significant, which rejects H3. No significant effect of CSR committee or expert, interlocking directorates, CEO duality, gender-diversity, and race-diversity on CSR quality is found, providing no support for H1, H2, H3, and H4. In the interaction model, the interaction terms CSR committee or expert on the board and CEO duality ($z = -2.34$, $p < 0.05$, two tailed), and interlocking directorates and gender-diversity ($z = -2.58$, $p < 0.01$, two tailed) are both negative and significant. However, both interaction terms do not remain intact after applying the Bonferroni correction.

For the component 'Company sustainability guidelines', with respect to the variables of

Table 13. Analysis of determinants of CSR quality (based on sustainability guidelines) related to board composition

Variable	Society sustainability guidelines	Society sustainability guidelines	Company sustainability guidelines	Company sustainability guidelines
CSR committee/expert	-0.0592	-0.1362	0.3676**	0.0709
	(-0.33)	(-0.27)	(2.54)	(0.19)
Interlocking directorates	0.1018	-0.3906	0.1585	0.1103
	(0.45)	(-0.91)	(0.88)	(0.32)
CEO Duality	-0.1408	-0.4201	-0.1315	-0.3857
	(-0.65)	(-0.89)	(-0.80)	(-1.03)
Independence	-0.9526**	-2.011**	-0.0767	0.4228
	(-2.47)	(-2.51)	(-0.25)	(0.62)
Gender-diversity	0.3281	3.925**	0.0286	0.2038
	(0.46)	(2.33)	(0.05)	(0.14)
Race-diversity	0.5389	0.1850	0.0887	2.295
	(0.56)	(0.08)	(0.12)	(1.24)
Company size	0.0435	0.0960	-0.2351**	-0.1853*
	(0.33)	(0.69)	(-2.33)	(-1.76)
Company leverage	-0.0175	0.1768	0.0195	0.1403
	(-0.05)	(0.48)	(0.07)	(0.52)
Financial performance	-0.1854	-0.2224	0.5391	0.6803
	(-0.38)	(-0.46)	(1.29)	(1.61)
Listed	0.6871***	0.8645***	0.0375	0.1347
	(2.67)	(3.15)	(0.21)	(0.73)
Media attention	0.0953	0.0717	-0.0326	-0.0516
	(1.25)	(0.92)	(-0.53)	(-0.80)
Board size	0.4986**	0.3933	-0.1322	-0.1728
	(2.16)	(1.64)	(-0.74)	(-0.95)
External assurance	0.5550***	0.5574***	0.0948	0.0557
	(3.68)	(3.72)	(0.72)	(0.41)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
CC[1] * CD[2]		-0.7890**		
		(-2.34)		
ID[3] * GD[4]		-3.771***		
		(-2.58)		
GD * RD[5]				-9.856*
				(-1.87)
Intercept	-1.558	-1.967	2.215*	1.713
	(-0.95)	(-1.13)	(1.78)	(1.33)
Wald chi[2]	83.69***	109.37***	42.24	63.27*
N	319	319	319	319

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent respectively. The values given represent the regression coefficient and the Z-values are provided in brackets.
[1] CC indicates the presence of a CSR committee/expert, [2] CD indicates CEO duality, [3] ID indicates interlocking directorates, [4] GD indicates gender-diversity, and [5] RD indicates race-diversity.
Tables 7 and 8 provide definitions of the variables.

interest, CSR committee or expert on the board ($z = 2.54$, $p < 0.05$, two tailed) is positive and significant, which supports H1. No significant influence of interlocking directorates, CEO-duality, independence, gender-diversity, and race-diversity on CSR quality is found, providing no support for H2, H3, and H4. In the interaction model, the interaction term gender-diversity and race-diversity ($z = -1.87$, $p < 0.10$, two tailed) is negative and significant. However, the interaction term does not remain intact after applying the Bonferroni correction.

Table 14 shows the effect of board composition on CSR quality based on the sustainability guidelines, including the control variable external assurance, and including the control variables on board activity. Also interaction terms are added for the combination of the board characteristics and board activity. For the 'Society sustainability guidelines' the Hausman test was not significant, indicating that the random effect model is best suited. Both industry group dummies and year dummies are included in this analysis, and one of the industry and year dummies is omitted because of multicollinearity reasons. For the 'Company sustainability guidelines' the Hausman test was significant, indicating that the fixed effect model is best suited. Therefore, only year dummies and no industry dummies are included, and one year dummy is omitted because of multicollinearity reasons. Again, the first column on the component in the table provides the regression without the interaction terms, and the second column of the component in the table provides the regression with interaction terms. As there is no multicollinearity between the different variables, all interaction terms are added together in the same regression. All interactions between the different board characteristics and also board activity are tested, and only the significant interactions are added to the model given the large number of possible interactions. The Bonferroni correction is also applied for this analysis, to adjust for multiple interaction testing. Now twenty-seven interaction are tested, and the critical P-value is reduced to $0.10/27 = 0.0037$ (Abdi, 2007).

For the 'Society sustainability guidelines' component, with respect to the variables of interest, independence ($z = -2.23$, $p < 0.05$, two tailed) is still negative and significant, rejecting H3. Again, there are no significant effects of CSR committee or expert, interlocking directorates, CEO duality, gender-diversity, and race-diversity found, providing no support for H1, H2, H3, and H4. In the interaction model, the interaction terms CSR committee or expert and CEO duality ($z = -3.06$, $p < 0.01$, two tailed), and interlocking directorates and gender-diversity ($z = -2.18$, $p < 0.05$, two tailed) are still negative and significant. In addition, the interaction terms CSR committee or expert and old directors ($z = 1.88$, $p < 0.10$, two tailed), and old directors and independence ($z = 2.13$, $p < 0.05$, two tailed) are now positive and significant. Furthermore, the interaction terms board meetings and CEO duality ($z = -1.86$, $p < 0.10$, two tailed), and old directors and race-diversity ($z = -2.09$, $p < 0.05$, two tailed) are now negative and significant. However, only the interaction CSR committee or expert and CEO duality remained intact after applying the Bonferroni correction (effect size 0.002, $P<0.003$).

Table 14. Analysis of determinants of CSR quality (based on sustainability guidelines) related to board composition and board activity

Variable	Society sustainability guidelines	Society sustainability guidelines	Company sustainability guidelines	Company sustainability guidelines
CSR committee/expert	-0.1043	-0.0889	0.1995	-0.1695
	(-0.59)	(-0.18)	(0.94)	(-0.18)
Interlocking directorates	0.1421	-0.2959	-0.3256	-1.345**
	(0.63)	(-0.69)	(-1.06)	(-2.01)
CEO Duality	-0.1273	-0.3424	-1.407***	-1.652**
	(-0.59)	(-0.73)	(-3.91)	(-2.08)
Independence	-0.8658**	-0.9968	0.6485	0.1246
	(-2.23)	(-1.12)	(1.41)	(0.12)
Gender-diversity	0.2903	3.397**	-0.7985	-2.684
	(0.41)	(2.00)	(-0.90)	(-1.23)
Race-diversity	0.4579	-1.709	1.025	3.067
	(0.47)	(-0.68)	(0.75)	(0.70)
Company size	0.0494	0.1084	-0.0028	0.2596
	(0.38)	(0.77)	(-0.01)	(1.02)
Company leverage	-0.0437	0.2210	1.127	1.699**
	(-0.12)	(0.60)	(1.62)	(2.29)
Financial performance	-0.2285	-0.3237	-0.0443	0.2702
	(-0.47)	(-0.67)	(-0.08)	(0.48)
Listed	0.5930**	0.8005***	-2.472*	-2.228
	(2.26)	(2.83)	(-1.70)	(-1.25)
Media attention	0.0893	0.0689	0.0169	-0.0609
	(1.17)	(0.88)	(0.18)	(-0.58)
Board size	0.4818**	0.3054	-0.1806	-0.2796
	(2.08)	(1.27)	(-0.57)	(-0.73)
External assurance	0.5475***	0.5708***	0.1614	0.1588
	(3.65)	(3.79)	(1.04)	(0.94)
Board meetings	0.3703*	1.142**	0.5615**	0.9662
	(1.92)	(2.18)	(2.21)	(1.24)
Old directors	-0.7280	-1.426	-0.8438	-4.698*
	(-0.93)	(-0.58)	(-0.97)	(-1.68)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	No	No
CC[1] * CD[2]		-1.045***		
		(-3.06)		
ID[3] * GD[4]		-3.384**		
		(-2.18)		
CC * OD[5]		2.929*		
		(1.88)		
BM[6] * CD		-0.8003*		
		(-1.86)		
OD * RD[7]		-22.57**		
		(-2.09)		
OD * IN[8]		8.120**		
		(2.13)		
GD * IN				-9.905***
				(-3.10)
Intercept	-2.363	-4.841**	0.3348	-1.691
	(-1.40)	(-2.40)	(0.18)	(-0.62)
Wald chi[2]	88.17***	143.94***		
F-test			2.23***	1.53**
N	319	319	319	319

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent respectively. The values given represent the regression coefficient, the Z-value for the society sustainability guidelines are provided in brackets, and the T-values for the company sustainability guidelines are provided in brackets. [1] CC indicates the presence of a CSR committee/expert, [2] CD indicates CEO duality, [3] ID indicates interlocking directorates, [4] GD indicates gender-diversity, [5] OD indicates old directors, [6] BM indicates board meetings, [7] RD indicates race-diversity, and [8] IN indicates independence. Tables 7 and 8 provide definitions of the variables.

For the 'Company sustainability guidelines' component, with respect to the variables of interest, CSR committee or expert is no longer significant, which provides no support for H1. In addition, CEO duality ($z = -3.91$, $p < 0.01$, two tailed) is now negative and significant, rejecting H3. Again, there are no significant effects of interlocking directorates, independence, gender-diversity, and race-diversity found, providing no support for H2, H3, and H4. In the interaction model, the interaction term gender-diversity and race-diversity is no longer significant. In addition, the interaction term gender-diversity and independence ($z = -3.10$, $p < 0.01$, two tailed) is now negative and significant. The interaction also remains intact after applying the Bonferroni correction (effect size 0.002, $P<0.003$).

4.3 Additional analysis

The components were not explicitly presenting a particular group of guidelines, and the analyses do not provide the results expected, therefore the analysis is also performed on the different sustainability and external assurance guidelines separately. First, there is tested for collinearity between the different guidelines, independent variables and control variables. As the Pearson and Spearman correlations are all below 0.6, it is concluded that there is no collinearity (Studenmund, 2014). Furthermore, the variance inflation factor never exceeds 10, indicating no multicollinearity (O'brien, 2007). First, a random effect probit model is used. However, this model indicates that there is no concavity in the sample, and therefore the model is not provided. This is due to the fact that most of the observations are zero's, indicating a failure and no compliance to the sustainability or external assurance guideline, which indicates poor starting values and pushes the variance estimate towards zero (Stata, 2017b). Hence, a logistic regression with clusters is performed on the different sustainability and external assurance guidelines. The logistic regression is clustered around companies, and year dummies are included[11]. External assurance is also included as a control variable for the sustainability guidelines. This analysis is performed to test the main effects of board composition on CSR quality, so no interaction terms are included.

Appendix 3 presents the effect of board composition on the different sustainability guidelines. The first column of the table presents the model on the specific guideline excluding board activity as control variable, and the second column of the table presents the model on the specific guideline including board activity as control variable[12]. The sustainability guidelines on SDGs and IFC are not taken into account, as there are not enough observations and not enough variance between these

[11] When including industry dummies, STATA omits observations of a particular industry group when they all have value zero (no compliance to a sustainability guideline). This is because the industry group then perfectly predicts a failure, so a value zero. As there are a lot of observations with value zero on the different sustainability guidelines, industry dummies are not taken into account.

[12] The interaction terms are not tabulated for the sustainability and external assurance guidelines separated, but the coefficients and significance of the interaction terms does not really change compared to the components. Almost all sustainability guidelines indicate a positive effect of the interaction terms CSR committee or expert and independence, CSR committee or expert and old directors, and interlocking directorates and old directors. Furthermore, the interaction terms interlocking directorates and gender-diversity, and CSR committee or expert and CEO duality, are for most guidelines negative and significant.

observations, respectively. The sustainability guideline AA1000 is not tested, because no report complies with this guideline. For the CDP guideline, with respect to the variables of interest, independence ($z = -3.60$, $p < 0.01$, two tailed) is negative and significant, rejecting H3. There are no significant effects of CSR committee or expert, interlocking directorates, CEO duality, gender-diversity, and race-diversity found, providing no support for H1, H2, H3, and H4. In the second column, including the control variables on board activity, independence ($z = -3.36$, $p < 0.01$, two tailed) is still negative and significant, which rejects H3. Again, there are no significant effects of CSR committee or expert, interlocking directorates, CEO duality, gender-diversity, and race-diversity found, providing no support for H1, H2, H3, and H4.

For the OECD guideline, with respect to the variables of interest, CSR committee/expert ($z = 1.91$, $p < 0.10$, two tailed) is positive and significant, and independence ($z = -1.65$, $p < 0.10$, two tailed) is negative and significant. These findings support H1 and reject H3. There are no significant effects of interlocking directorates, CEO duality, gender-diversity, and race-diversity found, providing no support for H2, H3, and H4. In the second column, including the control variables on board activity, CSR committee or expert ($z = 1.82$, $p < 0.10$, two tailed) is still positive and significant, which supports H1. However, independence is not significant anymore, providing no support for H3. Again, there are no significant effects of interlocking directorates, CEO duality, gender-diversity, and race-diversity found, providing no support for H2, H3, and H4.

For the UNGC guideline, with respect to the variables of interest, independence ($z = -2.01$, $p < 0.05$, two tailed) is negative and significant, which rejects H3. There are no significant effects of CSR committee or expert, interlocking directorates, CEO duality, gender-diversity, and race-diversity found, providing no support for H1, H2, H3, and H4. In the second column, including the control variables on board activity, independence ($z = -1.68$, $p < 0.10$, two tailed) is still negative and significant, which rejects H3. Again, there are no significant effects of CSR committee or expert, interlocking directorates, CEO duality, gender-diversity, and race-diversity found, providing no support for H1, H2, H3, and H4.

For the ISO 26000 guideline, with respect to the variables of interest, CSR committee or expert ($z = 2.75$, $p < 0.01$, two tailed), and interlocking directorates ($z = 2.47$, $p < 0.05$, two tailed) are positive and significant, and gender-diversity ($z = -2.16$, $p < 0.05$, two tailed) is negative and significant. This supports H1 and H2, but rejects H4. There are no significant effects of CEO duality, independence, and race-diversity found, providing no support for H3 and H4. In the second column, including the control variables on board activity, CSR committee or expert ($z = 2.72$, $p < 0.01$, two tailed), and interlocking directorates ($z = 2.66$, $p < 0.01$, two tailed) are still positive and significant, which supports H1 and H2. In addition, gender-diversity ($z = -2.16$, $p < 0.05$, two tailed) is still negative and significant, which rejects H4. Again, there are no significant effects of CEO duality, independence, and race-diversity found, providing no support for H3 and H4.

For the stakeholder panel/expert opinion, with respect to the variables of interest, CSR

committee or expert ($z = 2.42$, $p < 0.05$, two tailed) is positive and significant, which supports H1. There are no significant effects of interlocking directorates, CEO duality, independence, gender-diversity, and race-diversity found, providing no support for H2, H3, and H4. In the second column, including the control variables on board activity, CSR committee or expert ($z = 2.25$, $p < 0.05$, two tailed) is still positive and significant, which supports H1. Again, there are no significant effects of interlocking directorates, CEO duality, independence, gender-diversity, and race-diversity found, providing no support for H2, H3, and H4.

Appendix 4 presents the effect of board composition on the different external assurance guidelines. The first column of the table presents the model on the specific guideline excluding board activity as control variable, and the second column of the table presents the model on the specific guideline including board activity as control variable. The external assurance guideline AA1000AS is not taken into account, as there is not enough variance in the observations. For external assurance itself, with respect to the variables of interest, CEO duality ($z = -2.29$, $p < 0.05$, two tailed) is negative and significant, which rejects H3. There are no significant effects of CSR committee or expert, interlocking directorates, independence, gender-diversity, and race-diversity found, providing no support for H1, H2, H3 and H4. In the second column, including the control variables on board activity, CEO duality ($z = -2.36$, $p < 0.05$, two tailed) is still negative and significant, which rejects H3. Again, there are no significant effects of CSR committee or expert, interlocking directorates, independence, gender-diversity, and race-diversity found, providing no support for H1, H2, H3, and H4.

For the ISAE3000 guideline, with respect to the variables of interest, independence ($z = 2.74$, $p < 0.01$, two tailed), and race-diversity ($z = 2.66$, $p < 0.01$, two tailed) are both positive and significant, which supports H3 and H4. There are no significant effects of CSR committee or expert, interlocking directorates, CEO duality, and gender-diversity found, providing no support for H1, H2, H3, and H4. In the second column, including the control variables on board activity, independence ($z = 2.51$, $p < 0.05$, two tailed), and race-diversity ($z = 2.77$, $p < 0.01$, two tailed) are still positive and significant. Again, there are no significant effects of CRS committee or expert, interlocking directorates, CEO duality, and gender-diversity found, providing no support for H1, H2, H3, and H4.

For the assurance standard: national (general) guideline, with respect to the variables of interest, there are no significant effects of CSR committee or expert, interlocking directorates, CEO duality, independence, gender-diversity and race-diversity found, providing no support for H1, H2, H3, and H4. In the second column, including the control variables on board activity, there are again no significant effects of CSR committee or expert, interlocking directorates, CEO duality, independence, gender-diversity, and race-diversity found, providing no support for H1, H2, H3, and H4.

For the assurance standard: national (sustainability) guideline, with respect to the variables of interest, CSR committee or expert ($z = 2.28$, $p < 0.05$, two tailed), and independence ($z = 1.81$, p

<0.10, two tailed) are both positive and significant, which supports H1 and H3. In addition, CEO duality (z = -1.76, p <0.10, two tailed) is negative and significant, which rejects H3. There are no significant effects of interlocking directorates, gender-diversity, and race-diversity found, providing no support for H2 and H4. In the second column, including the control variables on board activity, CSR committee or expert (z = 2.27, p <0.05, two tailed) is still positive and significant, which supports H1. In addition, CEO duality (z = -1.83, p <0.10, two tailed) is still negative and significant, which rejects H3. However, independence is not significant anymore, providing nu support for H3. Again, there are no significant effects of interlocking directorates, gender-diversity, and race-diversity found, providing no support for H2 and H4.

The results often indicate a negative effect of independence on CSR quality. Nevertheless, this is not in line with the expectation that independent board members aim for more transparency regarding sustainability, and are more effective in controlling management, thereby increasing CSR quality. To further examine this relationship, the dummy variable on independence is used. The analyses for the different components are performed again, and this time the dummy is used instead of the proportion of independence, also for calculating the interaction terms. As the results do not change much when including the control variables on board activity, the analyses are performed without the control variables for board activity. Appendix 5 provides the results relating to the components based on the sustainability and external assurance guidelines together. For the component 'Sustainability guidelines', independence (z = -1.75, p <0.10, two tailed) is still negative and significant, which rejects H3. In addition, CEO duality (z = -1.94, p <0.10, two tailed) is now also negative and significant, which rejects H3. In the interaction model, the interaction terms interlocking directorates and gender-diversity (z = -2.90, p <0.01, two tailed), and race-diversity and CEO duality (z = -1.81, p <0.10, two tailed) remain negative and significant. For the component 'National external assurance', CSR committee or expert (z = -1.95, p <0.10, two tailed) is still negative and significant, which rejects H1. However, independence is not significant anymore, providing no support for H3. In addition, the interaction terms CSR committee or expert and CEO duality, and CSR committee or expert and independence are not significant anymore. For the component 'International external assurance guidelines', independence is not significant anymore, providing no support for H3. In the interaction model, the interaction term interlocking directorates and race-diversity (z = 1.99, p <0.05, two tailed) is still positive and significant. Furthermore, the interaction term between CSR committee or expert and independence (z = 2.50, p <0.05, two tailed) is now positive and significant.

Appendix 6 provides the results relating to the components of only the sustainability guidelines. For the component 'Society sustainability guidelines', independence is not significant anymore, providing no support for H3. In the interaction model, the interaction terms CSR committee or expert and CEO duality (z = -1.81, p <0.10, two tailed), and interlocking directorates and gender-diversity (z = -3.28, p <0.01, two tailed) are still negative and significant. In addition, the interaction term between CSR committee or expert and interlocking directorates (z = 1.79, p <0.10, two tailed) is

now positive and significant. For the component 'Company sustainability guidelines', CSR committee or expert ($z = 2.49$, $p < 0.05$, two tailed) is still positive and significant, which supports H1. In the interaction model, the interaction term between gender-diversity and race-diversity is no longer significant, but the interaction term between CSR committee or expert and CEO duality ($z = 1.88$, $p < 0.10$, two tailed) is now positive and significant.

4.4 Sensitivity analyses

It might be that some measures used are significantly influencing the results. To reduce this possibility, there are different sensitivity analysis included to examine the robustness of the results. The sensitivity analysis is executed using the PCA containing both the sustainability and external assurance guidelines and the PCA on only the sustainability guidelines. First, the different dummies on the industry groups are replaced by a dummy variable indicating sensitive industries. Regarding the PCA on both the sustainability and external assurance guidelines, for the component 'Sustainability guidelines', independence is no longer significant, providing no support for H3. In the interaction model, the interaction term interlocking directorates and gender-diversity is no longer significant. For the component 'National external assurance', CSR committee or expert is no longer significant, providing no support for H1. In the interaction model, the interaction term race-diversity and CEO duality ($z = 1.70$, $p < 0.10$, two tailed) is now also positive and significant. For the component 'International external assurance guidelines', independence is no longer significant, and gender-diversity ($z = -1.70$, $p < 0.10$, two tailed) is now negative and significant, providing no support for H3 and H4. Regarding the PCA on only the sustainability guidelines, for the component 'Society sustainability guidelines', there are no changes. For the component 'Company sustainability guidelines, the interaction term between CSR committee or expert and CEO duality ($z = 1.88$, $p < 0.10$, two tailed) is now positive and significant.

Secondly, the company performance measure return on assets is replaced by the company performance measure return on equity (ROE). Regarding the PCA for both sustainability and external assurance guidelines, for the component 'Sustainability guidelines', CSR committee or expert ($z = 1.82$, $p < 0.10$, two tailed) is now also positive and significant, which supports H1. In the interaction model, the interaction term interlocking directorates and gender-diversity is no longer significant. For the component 'National external assurance', the interaction term CSR committee or expert and CEO duality is no longer significant. For the component 'International external assurance guidelines', independence is no longer significant, providing no support for H3. In the interaction model, the interaction term interlocking directorates and race-diversity is no longer significant. However, the interaction term race-diversity and CEO duality ($z = -1.84$, $p < 0.10$, two tailed) is now negative and significant. For the PCA on only the sustainability guidelines, for the component 'Society sustainability guidelines', there are no changes. For the component 'Company sustainability guidelines', the interaction term CSR committee or expert and CEO duality ($z = 1.75$, $p < 0.10$, two

tailed) is now also positive and significant.

Thirdly, the company performance measure return on assets is replaced by the loss dummy. For the PCA on both the sustainability and external assurance guidelines, for the components 'Sustainability guidelines' and 'National external assurance', there are no changes. For the component 'International external assurance guidelines', independence is no longer significant, providing no support for H3. In the interaction model, the interaction term gender-diversity and CEO duality ($z = -1.65$, $p < 0.10$, two tailed) is now also negative and significant. For the PCA on only the sustainability guidelines, for the component 'Society sustainability guidelines', there are no changes. For the component 'Company sustainability guidelines', the interaction term gender-diversity and independence ($z = -1.65$, $p < 0.10$, two tailed) is now also negative and significant.

Fourthly, the gender-diversity measure on the proportion of females on the board is replaced by the dummy variable on gender-diversity. In calculating the interaction terms the dummy is also used, instead of the proportion of females on the board. For the PCA on both sustainability and external assurance guidelines, for the component 'Sustainability guidelines', independence is no longer significant, providing no support for H3. CSR committee or expert ($z = 1.86$, $p < 0.10$, two tailed) is now positive and significant, which supports H1. Furthermore, the female dummy ($z = 3.01$, $p < 0.01$, two tailed) is positive and significant, which supports H4. In the interaction model, the interaction term interlocking directorates and gender-diversity is no longer significant. For the component 'National external assurance', CSR committee or expert is no longer significant, providing no support for H1. In the interaction model, the interaction term CSR committee or expert and independence is no longer significant. For the component 'International external assurance', independence is no longer significant, providing no support for H3. The female dummy ($z = -1.73$, $p < 0.10$, two tailed) is now negative and significant, which rejects H4. In the interaction model, the interaction term interlocking directorates and race-diversity is no longer significant. However, the interaction term race-diversity and CEO duality ($z = -1.65$, $p < 0.10$, two tailed) is now negative and significant. For the PCA on only the sustainability guidelines, for the component 'Society sustainability guidelines', the interaction term interlocking directorates and gender-diversity is no longer significant. In addition, the interaction term interlocking directorates and independence ($z = 1.79$, $p < 0.10$, two tailed) is now positive and significant. For the component 'Company sustainability guidelines', the female dummy ($z = -3.35$, $p < 0.01$, two tailed) is now negative and significant, which rejects H4. In the interaction model, the interaction term gender-diversity and race-diversity is no longer significant. Furthermore, the interaction terms interlocking directorates and race-diversity ($z = -1.95$, $p < 0.10$, two tailed), and CEO duality and the female dummy ($z = -1.82$, $p < 0.10$, two tailed) are now negative and significant.

Fifthly, the PCA is performed including the SDGs guideline for 2015[13]. For the PCA on the sustainability and external assurance guidelines, for the component 'Sustainability guidelines', CSR committee or expert ($z = 1.81$, $p < 0.10$, two tailed) is now also positive and significant, supporting H1. For the component 'National external assurance', CSR committee or expert is no longer significant, providing no support for H1. In the interaction model, the interaction term CSR committee or expert and CEO duality is no longer significant. However, the interaction terms CSR committee or expert and gender-diversity ($z = -1.99$, $p < 0.05$, two tailed), interlocking directorates and gender-diversity ($z = -1.70$, $p < 0.10$, two tailed), and gender-diversity and race-diversity ($z = -2.07$, $p < 0.05$, two tailed) are all negative and significant. For the 'International external assurance guidelines', independence is no longer significant, providing no support for H3. In addition, race-diversity ($z = 1.91$, $p < 0.10$, two tailed) is now positive and significant, which supports H4. In the interaction model, the interaction term interlocking directorates and race-diversity is no longer significant. However, the interaction terms CSR committee or expert and interlocking directorates ($z = 1.77$, $p < 0.10$, two tailed), and CSR committee or expert and CEO duality ($z = 2.00$, $p < 0.05$, two tailed) are now positive and significant. Furthermore, the interaction terms CSR committee or expert and independence ($z = -1.81$, $p < 0.10$, two tailed), interlocking directorates and independence ($z = -2.06$, $p < 0.05$, two tailed), gender-diversity and CEO duality ($z = -1.74$, $p < 0.10$, two tailed), and race-diversity and CEO duality ($z = -2.67$, $p < 0.01$, two tailed) are now negative and significant. For the PCA on sustainability guidelines, for the component 'Society sustainability guidelines', only the interaction term between CSR committee or expert and CEO duality is not significant anymore. For the component 'Company sustainability guidelines', the interaction term CSR committee or expert and CEO duality ($z = 3.16$, $p < 0.01$, two tailed) is now positive and significant. Furthermore, the interactions CSR committee or expert and independence ($z = -1.66$, $p < 0.10$, two tailed), gender-diversity and independence ($z = -1.73$, $p < 0.10$, two tailed), and race-diversity and CEO duality ($z = -1.70$, $p < 0.10$, two tailed) are now negative and significant.

Lastly, CSR reporting quality is assessed by using the company's use of energy, emission of carbon dioxide, waste, and water consumption (Hammond & Miles, 2004). First, to reduce the effect of outliers, the variables are winsorized at the 1% level and there distributions are examined[14]. Then a Hausman test is performed on the four different variables, to indicate whether a fixed effect or random effect model is better suited. For waste, the random effect model is best suited. There are no significant associations found for the independent variables, providing no support for H1, H2, H3, and H4. In the interaction model, the interaction term race-diversity and CEO duality ($z = -1.69$, $p < 0.10$, two tailed) is negative and significant. For the use of energy, the random effects model is best suited.

[13] This is done by running the PCA on 2015 and on 2014/2013 together. Then, these values are used to calculate the components. For all the components a Hausman test is performed to indicate whether the random effects or fixed effects model is better suited. In all cases, the random effects model is better suited.

[14] The changes to the variables (log, quadratic, etc.) do not improve the distribution, so the winsorized variables are used in the analysis.

Interlocking directorates (z = 1.73, p <0.10, two tailed) is positive and significant, which supports H2. In the interaction model, the interaction terms CSR committee or expert and race-diversity (z = -1.98, p <0.05, two tailed), and race-diversity and CEO duality (z = - 1.66, p <0.10, two tailed) are both negative and significant. For the emission of carbon dioxide, the random effect model is best suited. There are no significant associations found for the independent variables, providing no support for H1, H2, H3, and H4. There are also no significant associations found for the interaction terms. For water consumption, the random effects model is best suited. Interlocking directorates (z = 6.00, p <0.01, two tailed), and CEO duality (z = -2.69, p <0.01, two tailed) are both positive and significant, which supports H2 and H3. In the interaction model, the interaction terms CSR committee or expert and interlocking directorates (z = 1.95, p <0.10, two tailed), interlocking directorates and race-diversity (z = 2.18, p <0.05, two tailed), and interlocking directorates and CEO duality (z = 3.19, p <0.01, two tailed) are all positive and significant. In addition, the interaction term CSR committee or expert and CEO duality (z = -2.42, p <0.05, two tailed) is negative and significant. However, all these results should be interpreted with caution, as there are only between 100 and 200 observations for each of the variables.

In sum, the results provide some support for H1 and H5, but do not support H2, H3, and H4.

5. Discussion

5.1 Interpretation of results

Overall, the results provide some support for the effect of CSR committee or expert on CSR quality. CSR committee or expert is often insignificant for the components, with only a negative effect on the 'National external assurance' component and a positive effect on the 'Company sustainability guidelines' component. However, when the regressions on the different guidelines are separated, CSR committee or expert sometimes has a positive effect on CSR quality. This is in line with H1, and indicates that CSR committee or expert provides the board with knowledge to improve CSR quality. This is in line with the findings in other studies, which also find a positive effect of CSR committee or expert on the board (Adnan et al., 2010, Amran et al., 2014). The negative effect and insignificant effects found on the components could be due to the composition of the components, as the components used are not uniform to one specific group of guidelines. In addition, as also the analysis on the separated guidelines do not always provide significant results, the insignificant results could be caused by the fact that there is no distinction made between a CSR committee and a CSR expert. The CSR expert on his own might not bring enough expertise or might not have enough influence to increase CSR quality. This might also be the case for the whole CSR committee, which is partly indicated by the positive effect of the interaction term CSR committee or expert and old directors. Old directors provide the board with more knowledge and experience, which supports the fact that the CSR committee or expert alone might not bring enough expertise or might not have enough influence the increase CSR quality. Furthermore, it might also be the case that the 'wrong' people are on the

CSR committee, as they do not have enough or the right knowledge to improve CSR quality of the company. Nevertheless, this seems to be unlikely as the company sees them as sustainability experts.

The results for interlocking directors do not support the expectation of H2, except for the separate analysis on the ISO 26000 guideline. These results indicate that when there are one or multiple interlocking directorates on the board, it will not have an effect on CSR quality. The insignificant result could be caused by the fact that there is not examined whether the interlocking directorate is with another company which provides a corporate sustainability report. When the other company does not provide a corporate sustainability report, the imitating possibilities and the possibility to get knowledge and experience of the other board will be reduced. If this is the case, the interlocking directorate will not provide a benefit to the board to provide higher quality CSR. In addition, there is no separation made between one interlocking directorate and multiple interlocking directorates. Multiple interlocking directorates on the board could have a higher positive effect on CSR quality than just one interlocking directorate.

The results on CEO duality do not support the expectation of H3, and there are even negative effects found for the separate analyses on external assurance, the assurance standard: national (sustainability), and the component 'Company sustainability guidelines'. It might be the case that if there is CEO duality, that the CEO has also the incentive to optimize CSR quality for the company. Especially for Dutch companies, as the government also supports corporate social responsibility, the CEO might want to increase CSR quality him-/herself. Furthermore, CEO duality might not influence CSR quality as it is not a crucial aspect of companies to provide high quality CSR. The other directors on the board can provide adequate checks to make sure that the CEO does not act in his own interests. The results on the proportion of independent directors do not support the expectation of H3, mostly a negative effect found. This finding contradicts previous studies, which report a positive effect of independence on CSR (Jizi, 2017; Jizi et al., 2014, Rupley et al., 2012). As the management of the company has a big influence of the sustainability operations of the organization, it might indicate that independent directors do not have any influence on these operations and can even negatively affect CSR quality as they have less knowledge of the operations of the organization than the non-independent directors. However, the additional analyses indicates that, except for the component 'Sustainability guidelines', independence is no longer negative significant when including a dummy with value 1 if the board consists of a higher proportion of independent directors than the median value of independent directors. This indicates that there might be some 'critical mass' for the proportion of independent directors to have an effect on CSR quality. It might even be that independence does not have an effect on CSR quality if there is no expertise on the board, as independence alone might not really effect CSR quality. This is supported by a positive significant interaction terms between CSR committee or expert and independence, for the component 'National external assurance'. When examining this further, this interaction term is also positive and significant for different separated sustainability guidelines (unreported), and when using the independence

dummy, it becomes even positive and significant for the component 'International external assurance guidelines'. Furthermore, the results on CEO duality and independence might be influenced by the fact that a director is considered independent if he/she is a non-executive director. However, it might be that he/she was formerly an executive director, but now only a non-executive director. The independence of the directors might also be influenced by the social and professional ties they have. Friendship ties or professional ties of the director to management or other directors in the board could hamper his/her independence. For example, monitoring quality of management can be lower due to friendship ties between directors and management.

The results on gender-diversity are insignificant and for the ISO 26000 guideline even negative significant, providing no support for H4. This indicates that if there is a higher proportion of females on the board, this would not have an influence on CSR quality. However, Jizi (2017), Fernandez-Feijoo et al. (2012) and Konrad et al. (2008) find a positive effect of female participation on CSR. One possible explanation is that 71.47% of the observations indicates two or less women on the board. Fernandez-Feijoo et al. (2012) and Konrad et al. (2008) argue that if a board is dominated by men, the influence of the women may be hampered and reduced by the majority group, which might lead to the fact that the women cannot influence CSR quality. This explanation is in line with Amran et al. (2014), as this study reports a percentage of 92.7% of observations with two or less women on the board and also indicating no significant effect. However, when including the female dummy with value 1 if there are three or more women on the board in the sensitivity analysis, only the component 'Sustainability guidelines' shows a positive effect of the female dummy, and the components 'International external assurance guidelines' and 'Company specific external assurance guidelines' even show a negative effect of the female dummy. These results might also indicate that the positive and negative effects of board diversity cancel each other out. On the one hand, board diversity provides more different perspectives and solutions, and enhances the board's capability to monitor top management. On the other hand, the different perspectives and solutions could make it harder to make short-term decisions, and can even lead to conflicts on the board. Hence, the insignificant results of gender-diversity might indicate that these two effects cancel each other out. The results on race-diversity are also insignificant, providing no support for H4. This finding might have the same reasons as mentioned for gender-diversity. In this case, 88.09% of the observations indicates two or less Africans, Asians, and/or Hispanics on the board. If the board is dominated by other, non-African, non-Asian, and/or non-Hispanics, the influence of this group may be hampered and reduced by the majority group, which might lead to the fact that this group cannot influence CSR quality. Furthermore, the positive and negative effects of board diversity might cancel each other out. More race-diversity will lead to more different perspectives and a better capability of monitoring management, but will also make it harder to make short-term decisions and may even lead to conflicts on the board.

The results on the interaction terms are very mixed. The significant interaction terms differ

between the different components, whether board activity is included as control variable, and also differ when the guidelines are regressed separately. Most of the interaction effects are also insignificant after applying the Bonferroni correction. Overall, there is a negative and significant effect found for the interaction term CSR committee or expert and board independence, when measured using CEO duality, on CSR quality. This indicates that if there is a CSR committee or expert on the board combined with no CEO duality, CSR quality will decrease. It was expected that both CSR committee or expert and CEO duality would have a positive effect on CSR quality, so this result is probably due to the limitations in the dataset and the variables used, as just discussed. In addition, the interaction term interlocking directorates and gender-diversity has also a negative and significant effect on CSR quality. This indicates that if there are interlocking directorates on the board combined with a higher proportion of females on the board, CSR quality will decrease. It was expected that both interlocking directorates and the proportion of females on the board would have a positive effect on CSR quality, so this result is probably due to the limitations in the dataset and the variables used, as just discussed. The interaction term is not significant anymore for the components if the female dummy is used instead of the proportion of females on the board. This indicates that probably the negative effect is due to the variables used.

There is a positive and significant effect found for the interaction term CSR committee or expert and old directors. This indicates that if there is a CSR committee or expert on the board combined with a higher proportion of old directors, CSR quality will be higher. In addition, there is a positive and significant effect found for the interaction term CSR committee or expert and independence, when measured using the proportion of independent directors. This indicates that if there is a CSR committee or expert on the board combined with a higher proportion of independent directors, CSR quality will increase. There is also a positive and significant effect found for the interaction term interlocking directorates and old directors. This indicates that if there are interlocking directorates on the board combined with a higher proportion of old directors, CSR quality will increase. These last three interaction terms provide support for H5, as they show that there are positive incremental effect of the board characteristics on CSR quality. Furthermore, these interactions are still positive and significant when examining the different sustainability and external assurance guidelines separately. Regarding the other interaction terms, the results are not conclusive and additional research is needed.

5.2 Limitations and future research

Some aspects of the results found in this study should be interpreted when taking into account their limitations. A first limitation is that because of the data availability, of 163 companies available, only 123 could be used for analyses. If these companies have a very different board composition than the other companies, the results would change when they are included. In addition, there are only three years examined, but the results might be different when more years are added. As the last couple of

years more companies provide sustainability reports, the results could be different for other years. A second limitation is that only Dutch companies are taken into account. The Netherlands is a progressive country regarding corporate sustainability, as argued. Therefore, the results might be different for other countries. Furthermore, as the Dutch is a progressive country and stimulates corporate sustainability reporting, the influence of the board composition on CSR quality might be lower than for a less progressive country. The focus on a small set of companies in the Netherlands could influence the results. Further research could focus on an international context, use more companies for each country, and use a more different years. By examining a broader sample, the country, year, and company differences are taken into account, which could explain why some studies find different effects of board composition on CSR than other studies (Amran et al., 2014, Jizi et al., 2014; Michelon & Parbonetti, 2012).

Third, board expertise is measured by using CSR committee or expert on the board. This could influence the results as the committee or expert alone might not have enough expertise or influence on the board to increase CSR quality. It might also be that the 'wrong' people are on the CSR committee, who do not have enough knowledge regarding corporate sustainability. Future research could examine this by using a broader measure for board expertise.

Fourth, for the data on interlocking directorates, there is no separation made between one interlocking directorate and multiple interlocking directorates on the board. Multiple interlocking directorates on the board could have a higher positive effect on CSR quality than one interlocking directorate. Furthermore, the type of company of the interlocking directorate could matter. If it is a company that does not provide a corporate sustainability report, or a company that does not deal with its corporate sustainability, it will probably have no effect on the imitating possibilities and knowledge of the director. This kind of interlocking directorates are therefore less likely to improve CSR quality than interlocking directorates with companies which provide a corporate sustainability report. Future research could make a distinction between one and multiple interlocking directorates, and could examine the companies with which the board has an interlocking directorate.

Fifth, when obtaining the data on independence, a director is considered independent if he/she is a non-executive director. However, it might be that he/she was formerly an executive director, but now only a non-executive director. This is not examined, and might influence the results of board independence on CSR quality, as these board members are not really independent. The independence of the directors might also be influenced by the social and professional ties they have. Friendship ties or professional ties of the director with management or other directors in the board could hamper his/her independence. This might influence the results, as these directors are seen as independent, but in reality are connected to the managers or other directors. Monitoring quality of management can be lower, for example, due to friendship ties between directors and management (Bruynseels & Cardinaels, 2014). Furthermore, CEO duality hampers independence, but a CEO that has the incentive to optimize CSR quality for the company will not decrease CSR quality. Especially for Dutch

companies, as the government also supports corporate social responsibility, the CEO might want to increase CSR quality him-/herself. It might also be that independence alone does not affect CSR quality, but that a combination of independence, and for example, board expertise is needed to affect CSR quality. Thus, further research could examine the former position of the director on the board, but also the social ties of the directors on the board with the other directors. In addition, further research could examine the combination of board independence and other board characteristics.

Sixth, for the data on board diversity, the results could be influenced by the fact that the companies examined have a very low proportion of gender-diversity and race-diversity on the board. There might be some 'critical mass' before the females or African, Asian, and/or Hispanic directors have an influence on CSR quality. Furthermore, besides the more different perspectives and experiences, the decision-making process of the board could take longer due to the board diversity. Further research could examine whether board diversity positively influences CSR quality by bringing different perspectives to the board, or negatively influences CSR quality by increasing the length of the decision-making process on the board. Future research could also focus on more companies with a higher board diversity, by also focusing on different countries and years.

Seventh, CSR quality is measured by using 13 different sustainability and external assurance guidelines. Another way to measure CSR quality is by using content analysis to construct a measure of CSR quality based on the data in the sustainability reports (Amran et al., 2014). This could provide different results, as it is not examined whether the report complies with guidelines, but the content of the report is taken into account. Furthermore, qualitative analysis could also provide more in-depth information. By interviewing the different directors on the board, these insights and answers can be used to examine how board composition influences CSR quality. Future research could focus on different ways to measure CSR quality, which could even involve a qualitative analysis.

6. Conclusion

This study examined whether board composition has an effect on CSR quality. It is argued that companies with a higher board expertise, more interlocking directorates, a higher board independence, and a higher board diversity will have higher CSR quality than companies with a lower board expertise, no interlocking directorates, a lower board independence, and a lower board diversity. Particularly, when companies have a higher board expertise, these experts provide knowledge and skills to the board which improve the monitoring quality of the board and enables the board to respond in a good and efficient way to sustainability issues (Hillman & Dalziel, 2003; Baysinger & Butler, 1985). When companies have more interlocking directorates on the board, the directors get more experience and imitating possibilities from their roles on other boards, which increases their capability to respond to sustainability issues and to copy high quality CSR (Barka & Dardour, 2015; Darus et al., 2013). When companies have a higher board independence, the independent directors are more inclined with the sustainability reputation and performance of the company, and they often have

another perspective regarding corporate sustainability, which enhances CSR quality (Ibrahim et al., 2003; Said et al., 2009). Lastly, when companies have a higher board diversity, the board will have more different perspectives and a wider range of skills and knowledge, which results in better monitoring of management and making better decisions related to corporate sustainability, which enhances CSR quality (Harjoto et al., 2015).

In contrast to the expectations, the results of several panel data and logistic regression analyses show that interlocking directorates and board diversity are rarely significant. Furthermore, the results provide some support for board expertise. Board independence, when measured using the proportion of independent directors on the board, seems to have a negative effect on CSR quality. This indicates that independent directors will probably not have the right knowledge and skills of the company itself, which leads to bad decisions regarding CSR quality. However, when using an independence dummy, the results are mostly insignificant. This indicates that there might be a 'critical mass', for which there needs to be a minimum proportion of independent directors on the board to influence CSR quality. It might also indicate that independence alone does not have an influence on CSR quality, but that a combination of independence with the other board characteristics positively influences CSR quality. Furthermore, the results suggest a negative effect of the interaction term board expertise and board independence, when measured using CEO duality. When the board has a CSR committee or expert combined with no CEO duality, CSR quality will decrease. This is also the case for the interaction of interlocking directorates and diversity. When the board has interlocking directorates combined with a higher proportion of female directors, CSR quality will decrease. However, these findings are probably due to the measures and dataset used. In addition, the results suggest a positive effect of the interaction term board expertise and board activity, when measured using old directors. When the board has a CSR committee or expert combined with a higher proportion of old directors, CSR quality will increase. The same goes for the interaction of interlocking directorates and board activity, when measured using old directors. When the board has interlocking directorates combined with a higher proportion of old directors, CSR quality will increase. Furthermore, the results suggest a positive effect of the interaction term board expertise and board independence, when measured using the proportion of independent directors. When the board has a CSR committee or expert combined with a higher proportion of independent directors, CSR quality will increase.

These results have several implications for practice and research related to CSR quality. First, the results have practical implications for managers and directors. This study finds some support for a positive effect of board expertise on CSR quality, a negative effect of the interaction terms board expertise and board independence (when measured using CEO duality), and interlocking directorates and gender-diversity on CSR quality, and a positive effect of the interaction terms board expertise and board activity, interlocking directorates and board activity, and board expertise and board independence (when measured using the proportion of independent directors) on CSR quality. When

directors or managers want to enhance CSR quality, they can take these findings into account when appointing or introducing a new director or manager to the board. In addition, standard setters can use these findings when they consider to provide legislation on CSR quality. Second, the findings that most of the board composition aspects have no effect on CSR quality has important implications for research. Current research focuses mostly on the effect of board composition on the disclosure of corporate social responsibility information, but does not examine the quality of this information (Liao et al., 2015; Chan et al., 2014; Ben-Amar & Mcllkenny, 2014; Michelon & Parbonetti, 2012). As this study almost finds no effect of board composition on CSR quality, despite some support for board expertise, research should examine which factors influence CSR quality and what the role of directors is in this. Third, the study examines the effect of interlocking directorates on CSR quality. It indicates that interlocking directorates itself do not have an effect on CSR quality, but that the combination of interlocking directorates and gender-diversity negatively effects CSR quality and the combination of interlocking directorates and board activity positively effects CSR quality. Therefore, research should take into account the effect of interlocking directorates on CSR quality. In addition, the results indicate that the combinations of board characteristics influences CSR quality. Thus, the possible interaction between the board composition characteristics need to be taken into account.

Overall, this study indicates that more research is needed regarding the effect of board composition on CSR quality, as it seems to be that the effect might not be as important as initially thought. However, in practice, the combination of different board characteristics seems to be important.

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8. Appendix

Appendix 1. Pearson Correlation Matrix with dependent variable including both sustainability and external assurance guidelines and control variables on board activity

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.0000												
2	-0.0000	1.0000											
3	0.0000	0.0000	1.0000										
4	0.2611***	0.0062	0.0071	1.0000									
5	0.1514***	-0.0110	0.0490	0.0023	1.0000								
6	0.1208**	-0.0898	-0.0826	0.0747	0.1314**	1.0000							
7	0.1179**	0.1269**	0.0735	0.1341**	-0.0117	-0.0681	1.0000						
8	0.1470***	-0.0016	0.0707	0.1318**	-0.1115**	-0.0029	0.1165**	1.0000					
9	-0.0157	-0.1835***	0.0140	0.0123	0.3563***	0.0763	-0.1395**	-0.4073***	1.0000				
10	0.3450***	0.1161**	-0.1068*	0.2567***	0.3602***	0.0696	0.1344**	-0.0274	0.2202***	1.0000			
11	0.4394**	0.0019	0.0069	0.2313***	0.3046***	0.1998***	0.1663***	0.0658	0.1132**	0.5554***	1.0000		
12	-0.0213	-0.1866***	-0.0341	0.0175	-0.0558	-0.0491	0.0051	-0.0955*	0.1236**	-0.0300	0.0105	1.0000	
13	0.3196***	0.1629***	-0.1146**	0.2417***	0.0687	-0.0078	0.0372	0.0607	-0.0659	0.4008***	0.2605***	-0.2495***	1.0000
14	-0.0581	0.0224	-0.0382	-0.0796	-0.1251**	-0.0000	-0.0053	0.1147**	-0.2556***	-0.0867	-0.0432	-0.1218**	-0.1331**
15	0.3788***	0.0273	-0.0488	0.2847***	0.3461***	0.2397***	0.1127**	0.0932*	0.1088*	0.5407***	0.5222***	-0.0545	0.3048***
16	-0.1129**	-0.0610	-0.0853	-0.1270**	0.0706	0.1387**	-0.2371***	-0.0602	0.1013*	-0.1010*	-0.2862***	0.0459	-0.2662***
17	0.1617***	0.0902	-0.1207**	0.1550***	-0.0512	0.0065	0.0836	0.1371**	-0.1309**	0.1649***	0.1360**	-0.0441	0.2528***
18	-0.0533	-0.1677***	0.0249	-0.0337	0.2246***	-0.0048	-0.0453	-0.1627***	0.2925***	-0.0534	-0.0585	0.1321**	-0.0815

	14	15	16	17	18
14	1.0000				
15	-0.0649	1.0000			
16	0.0073	-0.0821	1.0000		
17	0.0038	0.2413***	-0.0354	1.0000	
18	-0.1238**	0.0476	-0.0177	-0.0125	1.0000

*, **, and *** indicate the statistical significance at the 1 percent, 5 percent, and 10 percent level respectively.

Appendix 2. Pearson Correlation Matrix with dependent variable including only sustainability guidelines and control variables on board activity and external assurance

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.0000												
2	0.0000	1.0000											
3	0.2298***	0.1162**	1.0000										
4	0.1226**	-0.0610	0.0023	1.0000									
5	0.0607	-0.0492	0.0747	0.1314**	1.0000								
6	0.1402**	-0.0772	0.1341**	-0.0117	-0.0681	1.0000							
7	0.1174**	0.0505	0.1318**	-0.1115**	-0.0029	0.1165**	1.0000						
8	-0.1265**	-0.1068*	0.0123	0.3563***	0.0763	-0.1395**	-0.4073***	1.0000					
9	0.3495***	-0.1928***	0.2567***	0.3602***	0.0696	0.1344**	-0.0274	0.2202***	1.0000				
10	0.3542***	0.1575***	0.2313***	0.3046***	0.1998***	0.1663**	0.0658	0.1132**	0.5554***	1.0000			
11	-0.1191**	-0.0133	0.0175	-0.0558	-0.0491	0.0051	-0.0955*	0.1236**	-0.0300	0.0105	1.0000		
12	0.3693***	-0.0603	0.2417***	0.0687	-0.0078	0.0372	0.0607	-0.0659	0.4008***	0.2605***	-0.2495***	1.0000	
13	-0.0323	0.1317**	-0.0796	-0.1251**	-0.0000	-0.0053	0.1147**	-0.2556***	-0.0867	-0.0432	-0.1218**	-0.1331**	1.0000
14	0.3273***	-0.1334**	0.2847***	0.3461***	0.2397***	0.1127**	0.0932*	0.1088*	0.5407***	0.5222***	-0.0545	0.3048***	-0.0649
15	-0.1151**	-0.0124	-0.1270**	0.0706	0.1387**	-0.2371***	-0.0602	0.1013*	-0.1010*	-0.2862***	0.0459	-0.2662***	0.0073
16	0.1969***	0.0197	0.1550***	-0.0512	0.0065	0.0836	0.1371**	-0.1309**	0.1649***	0.1360**	-0.0441	0.2528***	0.0038
17	-0.1319**	-0.0581	-0.0337	0.2246***	-0.0048	-0.0453	-0.1627***	0.2925***	-0.0534	-0.0585	0.1321**	-0.0815	-0.1238**
18	0.2967***	-0.0067	0.1776***	0.0978*	0.1571**	-0.0113	0.1385**	0.0631	0.1766***	0.3799***	0.1461***	0.0995	-0.0185

	14	15	16	17	18
14	1.0000				
15	-0.0821	1.0000			
16	0.2413***	-0.0354	1.0000		
17	0.0476	-0.0177	-0.0125	1.0000	
18	0.2761***	-0.1216**	0.0443	0.0627	1.0000

*, **, and *** indicate the statistical significance at the 1 percent, 5 percent, and 10 percent level respectively.

Appendix 3. Analysis of determinants of CSR quality (based on separated sustainability guidelines) related to board composition and board activity

Variable	CDP	CDP	OECD	OECD	UNGC	UNGC	ISO26000	ISO26000	Stakeh. panel/expert opinion	Stakeh. panel/expert opinion
CSR committee/expert	-0.1688	-0.2046	0.9371*	0.8864*	0.0533	-0.0043	1.319***	1.310***	1.382**	1.350**
	(-0.32)	(-0.38)	(1.91)	(1.82)	(0.14)	(-0.01)	(2.75)	(2.72)	(2.42)	(2.25)
Interlocking directorates	-0.3163	-0.1948	-0.2080	-0.1341	0.0879	0.2317	1.976**	2.134***	-0.2113	0.0902
	(-0.43)	(-0.27)	(-0.32)	(-0.20)	(0.19)	(0.50)	(2.47)	(2.66)	(-0.36)	(0.14)
CEO Duality	-0.0754	0.0106	0.0363	0.0752	0.3140	0.3831	-0.3305	-0.2875	0.3358	0.4755
	(-0.15)	(0.02)	(0.07)	(0.15)	(0.80)	(0.97)	(-0.62)	(-0.53)	(0.55)	(0.73)
Independence	-4.110***	-4.051***	-2.217*	-2.033	-1.671**	-1.430*	-1.946	-1.587	-0.8137	-0.2757
	(-3.60)	(-3.36)	(-1.65)	(-1.45)	(-2.01)	(-1.68)	(-1.54)	(-1.24)	(-0.68)	(-0.23)
Gender-diversity	1.982	1.983	-1.363	-1.421	2.360	2.323	-5.170**	-5.383**	3.108	3.115
	(0.98)	(0.95)	(-0.41)	(-0.43)	(1.54)	(1.50)	(-2.16)	(-2.16)	(1.31)	(1.25)
Race-diversity	-0.0782	0.2274	-0.5300	-0.3387	1.826	1.915	0.3334	0.3926	-2.609	-2.927
	(-0.03)	(0.10)	(-0.14)	(-0.09)	(1.12)	(1.20)	(0.15)	(0.18)	(-0.90)	(-1.03)
Company size	0.2279	0.2331	0.3769	0.3519	0.0565	0.0338	0.2298	0.2053	-0.3428	-0.4658
	(0.79)	(0.82)	(1.32)	(1.26)	(0.31)	(0.19)	(0.83)	(0.75)	(-1.30)	(-1.61)
Company leverage	-1.042	-1.007	-0.9891	-0.9577	-0.2145	-0.1871	-0.6119	-0.5488	0.1809	0.2772
	(-1.14)	(-1.12)	(-1.33)	(-1.30)	(-0.35)	(-0.30)	(-0.68)	(-0.61)	(0.20)	(0.33)
Financial performance	-2.426	-1.766*	-6.361*	-5.795*	0.0367	-0.0034	0.4420	0.4305	2.048***	1.764**
	(-1.32)	(-1.76)	(-1.82)	(-1.65)	(0.05)	(-0.01)	(0.43)	(0.46)	(3.02)	(2.29)
Listed	1.815***	1.761***	1.003*	0.9670*	0.3410	0.2644	0.3507	0.2464	0.7523	0.5064
	(3.29)	(3.15)	(1.84)	(1.68)	(0.83)	(0.61)	(0.56)	(0.41)	(1.29)	(0.84)
Media attention	0.1393	0.0901	0.1623	0.1578	0.2741*	0.2577	-0.1325	-0.1358	-0.0250	0.0234
	(0.48)	(0.31)	(0.79)	(0.78)	(1.75)	(1.64)	(-0.68)	(-0.68)	(-0.12)	(0.09)
Board size	1.371**	1.337***	0.3769	0.8238	0.8633*	0.8046*	-0.9674	-1.016*	0.0795	0.0038
	(2.54)	(2.57)	(1.32)	(1.64)	(1.86)	(1.75)	(-1.61)	(-1.79)	(0.10)	(0.00)
External assurance	1.487***	1.524***	1.357***	1.374***	1.028***	1.072***	0.4661	0.5267	0.9455	1.085
	(3.20)	(3.22)	(2.84)	(2.86)	(2.70)	(2.74)	(1.13)	(1.26)	(1.54)	(1.51)
Board meetings		0.5852		0.2333		0.4860		0.3728		0.8272*
		(1.56)		(0.40)		(1.25)		(0.81)		(1.71)
Old directors		-0.5744		-1.869		-2.410		-2.707		-8.627**
		(-0.15)		(-0.62)		(-0.92)		(-0.95)		(-2.01)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	-7.428***	-8.718***	-8.685***	-8.856***	-5.312***	-5.998***	-2.112	-2.625	-1.215	-1.845
	(-3.16)	(-3.74)	(-3.40)	(-3.15)	(-3.65)	(-3.87)	(-0.85)	(-1.03)	(-0.51)	(-0.79)
Wald chi^2	63.78***	69.92***	64.94***	70.38***	41.33***	43.94***	30.30**	34.04**	47.48***	61.38***
N	319	319	319	319	319	319	319	319	319	319

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent respectively. The values given represent the regression coefficient and the Z-values are provided in brackets. Tables 7 and 8 provide definitions of the variables.

Appendix 4. Analysis of determinants of CSR quality (based on separated external assurance guidelines) related to board composition and board activity

Variable	External assurance	External assurance	ISAE3000	ISAE3000	Assurance standard: national (general)	Assurance standard: national (general)	Assurance standard: national (sustainability)	Assurance standard: national (sustainability)
CSR committee/expert	0.2667	0.2920	-0.5869	-0.5818	0.2760	0.3413	0.9287**	0.9621**
	(0.83)	(0.91)	(-1.15)	(-1.15)	(0.73)	(0.90)	(2.28)	(2.27)
Interlocking directorates	-0.0744	-0.1566	-0.7831	-0.8636	0.6007	0.4488	0.3710	0.2598
	(-0.16)	(-0.35)	(-0.90)	(-0.91)	(1.02)	(0.76)	(0.61)	(0.45)
CEO Duality	-0.7827**	-0.8166**	-0.5027	-0.5311	-0.4345	-0.4466	-0.6682*	-0.7013*
	(-2.29)	(-2.36)	(-0.86)	(-0.90)	(-1.10)	(-1.15)	(-1.76)	(-1.83)
Independence	0.7692	0.6000	2.912***	3.017**	1.184	0.8507	1.599*	1.373
	(1.06)	(0.80)	(2.74)	(2.51)	(1.32)	(0.90)	(1.81)	(1.45)
Gender-diversity	1.076	1.157	-1.404	-1.4500	-0.2389	-0.0755	1.551	1.816
	(0.80)	(0.88)	(-0.64)	(-0.63)	(-0.17)	(-0.05)	(1.02)	(1.25)
Race-diversity	-1.939	-1.913	6.364***	6.471***	-2.041	-2.019	0.2842	0.1597
	(-1.36)	(-1.36)	(2.66)	(2.77)	(-1.17)	(-1.11)	(0.13)	(0.07)
Company size	0.8168***	0.8289***	0.8882***	0.8816***	0.4446**	0.4838**	0.3971*	0.4421**
	(4.20)	(4.39)	(2.64)	(2.71)	(2.48)	(2.52)	(1.94)	(2.03)
Company leverage	1.715**	1.679**	-0.8181	-0.7602	0.8597	0.7798	0.9752	0.9430
	(2.53)	(2.48)	(-0.71)	(-0.68)	(1.48)	(1.31)	(1.40)	(1.34)
Financial performance	0.3311	0.3563	-8.877*	-10.63**	-2.956*	-3.130	0.4474	0.4990
	(0.39)	(0.41)	(-1.78)	(-2.05)	(-1.67)	(-1.64)	(0.32)	(0.34)
Listed	0.3118	0.3549	-0.1140	-0.0016	0.2994	0.3623	0.6359*	0.6810*
	(0.86)	(0.98)	(-0.18)	(-0.00)	(0.87)	(1.07)	(1.75)	(1.84)
Media attention	0.1729	0.1771	0.4115	0.4799	-0.0716	-0.0686	0.0011	-0.0141
	(1.16)	(1.19)	(1.41)	(1.60)	(-0.51)	(-0.47)	(0.01)	(-0.08)
Board size	-0.5390	-0.4995	-0.3845*	-0.4628	-1.072**	-1.000**	0.0500	0.1193
	(-1.36)	(-1.26)	(-0.43)	(-0.55)	(-2.43)	(-2.29)	(0.10)	(0.25)
Board meetings		-0.2381		-0.4891		-0.3071		-0.0933
		(-0.74)		(-0.94)		(-0.92)		(-0.24)
Old directors		1.338		-0.8634		2.303		2.598
		(0.81)		(-0.25)		(1.49)		(1.04)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	-7.326***	-7.020***	-11.21***	-9.985***	-3.947***	-3.850**	-8.727***	-9.263***
	(-4.58)	(-4.22)	(-4.07)	(-3.62)	(-2.85)	(-2.32)	(-4.91)	(-4.39)
Wald chi^2	51.69***	54.50***	35.30***	36.90***	32.22**	33.50***	50.59***	49.18***
N	319	319	319	319	319	319	319	319

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent respectively. The values given represent the regression coefficient and the Z-values are provided in brackets. Tables 7 and 8 provide definitions of the variables.

Appendix 5. Analysis of determinants of CSR quality (based on sustainability and external assurance guidelines) related to board composition with alternative independence measure

Variable	Sustainability Guidelines	Sustainability guidelines	National external assurance	National external assurance	International external assurance guidelines	International external assurance guidelines
CSR committee/expert	0.2967	0.6368	-0.3384*	-0.2937	0.0784	-0.0588
	(1.46)	(1.24)	(-1.95)	(-0.70)	(0.51)	(-0.17)
Interlocking directorates	0.0969	-0.1353	-0.0473	-0.4648	0.2152	0.4465
	(0.38)	(-0.30)	(-0.22)	(-1.20)	(1.16)	(1.35)
CEO Duality	-0.4392*	-0.5878	0.0349	-0.1519	-0.1379	-0.1005
	(-1.94)	(-1.16)	(0.19)	(-0.36)	(-0.89)	(-0.28)
Independence	-0.3198*	-0.5417	-0.4466	-0.4134	0.1518	0.1882
	(-1.75)	(-1.25)	(0.28)	(-1.03)	(1.03)	(0.51)
Gender-diversity	0.4253	3.548*	-0.1057	2.005	-0.6755	1.019
	(0.53)	(1.95)	(-0.16)	(1.23)	(-1.14)	(0.70)
Race-diversity	0.4023	0.0542	0.5127	-1.386	-0.0449	-0.5997
	(0.38)	(0.02)	(0.59)	(-0.76)	(-0.06)	(-0.40)
Company size	0.2603*	0.298**	0.0105	-0.0211	0.1576	0.0896
	(1.83)	(1.98)	(0.09)	(-0.17)	(1.58)	(0.85)
Company leverage	0.2639	0.3495	-0.3900	-0.4048	-0.2636	-0.2253
	(0.68)	(0.87)	(-1.27)	(-1.23)	(-1.01)	(-0.84)
Financial performance	-0.1929	-0.1192	0.1218	0.1769	-0.4458	-0.3087
	(-0.34)	(-0.21)	(0.24)	(0.34)	(-0.97)	(-0.66)
Listed	0.7483***	0.8360***	0.1127	0.1607	-0.3943**	-0.3266*
	(2.75)	(2.99)	(0.54)	(0.73)	(-2.28)	(-1.84)
Media attention	0.1252	0.1130	0.0353	0.0538	0.0316	0.0530
	(1.45)	(1.26)	(0.48)	(0.68)	(0.49)	(0.77)
Board size	0.1095	-0.0293	0.3381	0.3488	-0.3347*	-0.3281*
	(0.43)	(-0.11)	(1.61)	(1.59)	(-1.85)	(-1.78)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
CC[1] * IN[2]						0.7319**
						(2.50)
ID[3] * GD[4]		-4.761***				
		(-2.90)				
ID * RD[5]						3.600**
						(1.99)
RD * CD[6]		-3.967*				
		(-1.81)				
Intercept	-3.460*	-4.201**	-0.3100	-0.0879	-0.9668	-0.6936
	(-1.95)	(-2.27)	(-0.21)	(-0.06)	(-0.74)	(-0.51)
Wald chi[2]	99.87***	118.91***	51.27**	61.63*	32.08	50.82
N	319	319	319	319	319	319

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent respectively. The values given represent the regression coefficient and the Z-values are provided in brackets.
[1] CC indicates the presence of a CSR Committee/expert, [2] IN indicates independence, [3] ID indicates interlocking directorates, [4] GD indicates gender-diversity, [5] RD indicates race-diversity, and [6] CD indicates CEO duality. Tables 7 and 8 provide definitions of the variables.

Appendix 6. Analysis of determinants of CSR quality (based on sustainability guidelines) related to board composition with alternative independence measure

Variable	Society sustainability guidelines	Society sustainability guidelines	Company sustainability guidelines	Company sustainability guidelines
CSR committee/expert	-0.0679	-0.3695	0.3626**	0.1370
	(-0.38)	(-0.76)	(2.49)	(0.40)
Interlocking directorates	0.0147	-0.7120*	0.1458	0.2769
	(0.07)	(-1.71)	(0.82)	(0.87)
CEO Duality	-0.2778	-0.6532	-0.1466	-0.1722
	(-1.32)	(-1.40)	(-0.94)	(-0.50)
Independence	-0.1887	-0.4579	0.0094	-0.0872
	(-1.20)	(-1.27)	(0.07)	(-0.27)
Gender-diversity	0.2117	3.821**	0.0205	1.130
	(0.30)	(2.44)	(0.04)	(0.85)
Race-diversity	0.5139	-1.037	0.0993	1.520
	(0.53)	(-0.49)	(0.13)	(1.02)
Company size	0.0308	0.0601	-0.2357**	-0.1567
	(0.23)	(0.43)	(-2.34)	(-1.49)
Company leverage	0.01285	0.2049	0.0155	0.0715
	(0.04)	(0.54)	(0.06)	(0.26)
Financial performance	-0.1612	-0.1525	0.5534	0.6521
	(-0.33)	(-0.31)	(1.32)	(1.54)
Listed	0.6882***	0.8014***	0.0414	0.1230
	(2.62)	(2.87)	(0.23)	(0.68)
Media attention	0.1006	0.0917	-0.0322	-0.0516
	(1.31)	(1.16)	(-0.52)	(-0.89)
Board size	0.4545*	0.3318	-0.1356	-0.1701
	(1.95)	(1.36)	(-0.76)	(-0.94)
External assurance	0.5569***	0.5411***	0.0948	0.0516
	(3.67)	(3.60)	(0.72)	(0.38)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
CC[1] * ID[2]		0.8622*		
		(1.79)		
CC * CD[3]		-0.6132*		0.5165*
		(-1.81)		(1.88)
ID * GD[4]		-4.584***		
		(-3.28)		
Intercept	-1.734	-2.132	2.184*	1.434
	(-1.05)	(-1.13)	(1.76)	(1.12)
Wald chi[2]	77.03***	100.05***	42.22	61.96*
N	319	319	319	319

*, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent respectively. The values given represent the regression coefficient and the Z-values are provided in brackets.
[1] CC indicates the presence of a CSR committee/expert, [2] ID indicates interlocking directorates, [3] CD indicates CEO duality, and [4] GD indicates gender-diversity. Tables 7 and 8 provide definitions of the variables.