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Orientation Influence Environmental Sustainability Disclosure?**

UK Evidence

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Do Board's Corporate Social Responsibility Strategy and Orientation Influence Environmental Sustainability Disclosure? UK Evidence

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ABSTRACT

The environmental implications of corporate economic activities have led to growing demands for firms and their boards to adopt sustainable strategies and to disseminate more useful information about their activities and impacts on environment. This paper investigates the impact of board's corporate social responsibility (CSR) strategy and orientation on the quantity and quality of environmental sustainability disclosure in UK listed firms. We find that effective board CSR strategy and CSR-oriented directors have a positive and significant impact on the quality of environmental sustainability disclosure, but not on the quantity. Our findings also suggest that the existence of a CSR committee and issuance of a stand-alone CSR report are positively and significantly related to environmental sustainability disclosure. When we distinguish between firms with high and low environmental risk, we find that the board CSR/sustainability practices that affect the quantity (quality) of environmental sustainability disclosure appear to be driven more by highly (lowly) environmentally sensitive firms. These results suggest that the board CSR/sustainability practices play an important role in ensuring a firm's legitimacy and accountability towards stakeholders. Our findings shed new light on this under-researched area and could be of interest to companies, policy-makers and other stakeholders.

Keywords: Environmental sustainability disclosure, board corporate social responsibility strategy, board corporate social responsibility orientation, corporate social responsibility committee, UK.

1. Introduction

The environmental implications of corporate economic activities have led to growing demands on firms to adopt sustainable strategies and to disseminate more relevant and reliable information on their environmental performance (Alberici and Querci, 2016; Arena *et al.*, 2015; D'Amico *et al.*, 2016; Shaukat *et al.*, 2016). Corporate Environmental Sustainability Disclosure (CESD) can typically be defined as the process of disseminating information related to a company's activities, aspirations, and public image with regard to environmental sustainability matters (Gray *et al.*, 2001). In practice, CESD practices are affected by the motives and values of corporate directors involved in formulating and setting environmental policies and strategies (Lock and Seele, 2015; Neugebauer *et al.*, 2016; Solomon and Lewis, 2002). Thus, board-level governance can play an important role in enhancing CESD practices (Khan *et al.*, 2013; Michelon *et al.*, 2015; Prado-Lorenzo and Garcia-Sanchez, 2010). These CESD practices indicate an effective corporate commitment to environmental responsibility and construct a firm's image of environmental performance designed to positively manage stakeholders' perceptions and to legitimise its existence (Clarkson *et al.*, 2008; Fifka, 2013; Mallin *et al.*, 2013).

Although Corporate Governance (CG) and Corporate Social Responsibility (CSR) reporting practices have been well researched as separate topics, few studies have investigated their interrelationship (Galbreath, 2010; Landry *et al.*, 2016; Jizi *et al.*, 2014; Schwartz, 2005; Seto-Pamies, 2015). In particular, prior research largely neglects investigating whether board's CSR strategy and orientation have influence on CESD practices. This paper fills this literature gap by investigating the influence of (i) board's CSR strategy, (ii) board's CSR orientation, (iii) the existence of CSR committee, and (iv) the issuance of a stand-alone CSR report on the quantity and quality of CESD.

Our results indicate that effective board's CSR strategy and CSR-oriented directors (i.e., boards with more independent directors, female directors and audit committees' directors with financial expertise) have a positive and significant effect on the quality of CESD, rather than its quantity. Moreover, the existence of CSR committee and issuance of stand-alone CSR reports are positively and significantly related to CESD. Interestingly, when we differentiate between firms with high- and low- environmental risk, we find that the board-level CSR attributes affecting the quantity (quality) of CESD appear to be driven more by highly (lowly)

environmentally sensitive firms. These results lend support to legitimacy, stakeholder, and resource dependence theories. Thus, our paper extends the applicability and predictive power of these complementary and overlapping theories.

This paper differs from prior research, and contributes to the literature in various ways. First, to the best of our knowledge, this is the first study to examine how effective board's CSR strategy and orientation can contribute to safeguarding stakeholders' interests via disseminating relevant and credible CESD. It also directly responds to the call for developing a better understanding of board attributes and CESD practices (Liao *et al.*, 2015; Lock and Seele, 2015; Michelon *et al.*, 2015). Second, this paper is innovative in employing a less subjective multi-dimensional quality model (MQM) for assessing the quality of CESD. This MQM goes beyond the more traditional author-based disclosure index, focusing on preparer- and user-based index that assesses the quality of environmental information (Beck *et al.*, 2010; Helfaya, 2012; Helfaya and Kotb, 2016). Third, our results suggest that firms with high levels of board's CSR strategy, CSR-oriented board, the existence of CSR committee, and publishing stand-alone reports are more likely to disclose more relevant and credible environmental information to gain its legitimacy and stakeholders' satisfaction. This may have important policy and regulatory implications (Khan *et al.*, 2013; Landry *et al.*, 2016; Seto-Pamies, 2015).

The remainder of the paper is structured as follows. Section 2 presents a multi-theoretical framework. Section 3 provides the literature review and hypotheses development, and Section 4 outlines research design. Section 5 discusses results, and Section 6 concludes the study.

2. A multi-theoretical perspective for CESD

CESD research has significantly increased over the last two decades with most of which relying largely on a single theoretical perspective, such as legitimacy, agency, stakeholder, resource dependence, institutional, and impression management theories (Alrazi *et al.* 2016; Chen and Roberts, 2010; Deegan *et al.*, 2002; Cooper and Slack 2015; Mallin and Michelon, 2011; Shaukat *et al.*, 2016), which limits our understanding of CESD practices (Gray *et al.*, 1995; Haque *et al.*, 2016). In contrast, this paper adopts a multi-theoretical perspective (i.e. legitimacy, stakeholder and resource dependence) as complementary rather than competing theories, to provide a richer basis for understanding and explaining the CESD behaviour.

Legitimacy theory proves that firms can gain social acceptance and legitimise their existence by engaging in CESD (Cho and Patten, 2007; Chen and Roberts, 2010; Deegan et al., 2002; Mallin and Michelon, 2011). According to Suchman (1995), corporate legitimation strategies are used to gain and maintain legitimacy (i.e., proactive strategy by good performer [the good apple]) or to repair legitimacy after a specific environmental accident (i.e., reactive strategy to clear the bad image by bad performer [the bad apple]) (Cho, 2009; Menguc *et al.*, 2010). These two legitimacy strategies, therefore, are used by firms to disclose information about their environmental performance and strategies to different stakeholders, to offset negative media coverage about current environmental crises and to purify this bad reputation (Lu and Abeysekera, 2014; Samkin and Schneider, 2010; Schwartz, 2005).

Stakeholder theory is concerned with the impact of environment on firms and focuses on the firms and its various stakeholders who form this environment (Deegan, 2007; Godfery *et al.*, 2010). Stakeholder theory also recognises that the influence of each stakeholder on the firm is dissimilar, and the expectations of different stakeholders are diverse and sometimes conflicting (Chen and Roberts, 2010). Thus, to receive the support from its stakeholders, firms need to have a dialogue with them to balance these conflicting expectations. CESD is, therefore, seen as part of this dialogue between firms and their stakeholders (see, Deegan and Unerman, 2006)

Finally, and closely connected with legitimacy and stakeholder theories, resource dependence theory (RDT) considers CESD as a tool to manage a company's image through communicating its output, goals, or methods of operations, and to enhance its legitimacy (Casciaro and Piskorski, 2005; Davis and Cobb, 2010; Hillman *et al.*, 2009; Schnitfeld and Busch, 2016). It focusses on the effect of the environmental constraint on organisation and its engagement in exchanges and transactions with other entities for various resources (Hillman *et al.*, 2009; Pfeffer and Salancik, 1978; Schnitfeld and Busch, 2016). RDT has been recently used to explain the role of the board of directors in achieving corporate sustainable developments (e.g., Casciaro and Piskorski, 2005; Mallin *et al.*, 2013; Shaukat *et al.*, 2016). It views the board as a resource for managing and controlling a company's external environmental risks (Pfeffer and Salancik, 1978). Hillman and Dalziel (2003) suggested that the key resource dependence related contributions of the board are enhancing corporate legitimacy, providing expertise and advice, formulating corporate strategy, facilitating access to resources and building good external relation with various stakeholders (Casciaro and Piskorski, 2005; Davis and Cobb, 2010; Hillman *et al.*, 2009).

The connection and basic assumptions used by the three theories explained above are that firms operate in a society that affects their practices, since the society has resources that firms want (Chen and Roberts, 2010; Hillman *et al.*, 2009). To receive these resources, firms have to meet the society's expectations. Thus, CESD can be used to convince the society that firms act in accordance with that society's expectations. In CESD literature, scholars have applied many theories, and in this regard Gray *et al.* (1995) and Chen and Roberts (2010) argued that it is not possible to explore CESD by using a single theory. With this in mind, this study used these three overlapping theories to give complementing investigation into the impact of board's CSR strategy and orientation on CESD.

3. Literature review and hypotheses development

3.1 Board's CSR Strategy

Only few of CSR-related studies have identified the variables of capturing a company's board strategy towards its environmental responsibilities (Shaukat *et al.*, 2016). According to Banerjee *et al.* (2003, p. 106), environmental strategy is "the extent to which environmental issues are integrated into a firm's strategic plans" to gain a competitive advantage. The board of directors is responsible for setting the environmental strategy and overseeing its implementation to make a positive impact on the environment (Fraj-Andrés *et al.*, 2009; Hart, 1995). RDT indicates that the firms' specific resources, such as financial, manufacturing and board-level human's vision and strategies could be used to create sustainable competitive advantages, compared to their peers (Shaukat *et al.*, 2016; Hillman *et al.*, 2009; Casciaro and Piskorski, 2005). Additionally, legitimacy and stakeholder theories highlight the importance of communicating these proactive environmental strategies to external stakeholders to gain social legitimacy (e.g., Martensson and Westerberg, 2016; Neugebauer *et al.*, 2016; Shaukat *et al.*, 2016). Empirically, and consistent with the theoretical predictions, Al-Tuwaijri *et al.* (2004) and Clarkson *et al.* (2011) prove that to achieve the firm's long-term interest, good management adopts proactive strategies for controlling environmental pollution. Moreover, Shaukat *et al.* (2016) find that firms with more proactive and comprehensive the firm's CSR strategy are likely to show better environmental performance to gain competitive advantage in the long-term. Accordingly, we frame our first hypothesis as follows:

H1a. *The quantity of CESD is positively associated with the effectiveness of board's CSR strategy.*

H1b. *The quality of CESD is positively associated with the effectiveness of board's CSR strategy.*

3.2 Board's CSR Orientation

Banerjee *et al.* (2003, p.106) define CSR orientation as “the recognition by directors to the importance of environmental issues facing their firms”. In this context, Shaukat *et al.* (2016) find that board's CSR orientation boosts the firm's CSR activities and environmental performance. Previous studies suggest that board attributes may be present amongst directors who have a positive effect on firm's CESD, such as board independence, gender diversity, and audit committee financial expertise. This study follows, among others, Liao *et al.* (2015) and Shaukat *et al.* (2016) in using several board-specific characteristics (i.e. board independence, board gender diversity, and audit committee financial expertise) to capture the board's CSR orientation.

Board Independence

Although, there is a lawful responsibility on all corporate directors to execute in the best interests of all stakeholders, this does not assure that directors will execute objectively. To achieve this objectivity, the UK CG Code (2014) requires a sufficient number of board members to be independent of management. The UK CG Code states that board independence means that there are no contractual relationships or circumstances that may affect its director's judgement (see, FRC, 2014, para. B.1.1). According to RDT and legitimacy-stakeholder framework, independent directors attract invaluable resources to their companies by having external dialogues with stakeholders and other organisations and enhancing their reputations (Arena *et al.*, 2015; Haniffa and Cooke, 2005; Mallin and Michelon, 2011). A number of studies (e.g., Chau and Gray, 2010; Cheng and Courtenay, 2006; Harjoto and Jo, 2011; Jizi *et al.*, 2014) document that independent boards are greatly engaged in CSR reporting to promote stakeholders' interests, and to facilitate a comparatively high degree of transparency and CESD. Accordingly, we argue that independent directors are more likely to focus on long-term financial performance goals and offer effective monitoring on environmental matters which in turn improve long-term sustainability.

Board Gender Diversity

Boardroom diversity, particularly gender diversity, is high on the agenda in the UK and in Europe (FRC, 2011). It is increasingly recognised that women can make a significant contribution to a board, especially in relation to social and environmental matters (Ben-Amar *et al.*, 2016; Liao *et al.*, 2015; Landry *et al.*, 2016; Post *et al.*, 2011). The role of female directors was explained from different perspectives. First, there is a general consensus that female

directors are more stakeholder-oriented and more sensitive to CSR issues, which in turn may support mechanisms of stakeholder engagement, and promote CESD practices (Al-Shaer and Zaman, 2016; Landry *et al.*, 2016; Liao *et al.*, 2015; Seto-Pamies, 2015). Second, female directors are more averse to litigation and reputation loss, which in turn could motivate them to take actions to get engaged in sustainable corporate initiatives and minimising perceived environmental risks (Srinidhi *et al.*, 2011). Third, female directors bring diverse perceptions and values to the boardroom, encourage democratic and participative decision-making, and broaden discussions to better represent the concerns of stakeholders, leading to an improvement in the firm's dedication towards CSR activities (Bear *et al.*, 2010; Nielsen and Huse, 2010). Accordingly, we argue that a gender-diverse board may affect CESD due to females' higher concerns of environmentally sustainable initiatives and greater empathy towards stakeholder issues.

Audit Committee Financial Expertise

Owing to the increasing complexity of accounting and auditing information, the expertise of audit committee serves as a valuable instrument in eliminating financial misstatements (Beasley *et al.*, 2009) and enhancing the quality and credibility of corporate reporting (Chen *et al.*, 2006; Smith, 2003; FRC, 2014). In the same way, environmental risks can have significant financial implications, such as environmental fines, litigation costs and potential cash outflows for environmental maintenance. Audit committee members with financial literacy are likely to be qualified for advising the board to avoid and manage these risks in both short- and long-term. Recently, Khan *et al.* (2013) find that the existence of an audit committee on the board has a positive and significant impact on CSR disclosures. Accordingly, to improve the quality of CSR disclosure practice, financial experts on audit committees can inspire their companies to apply CSR reporting guidelines, set a CSR committee, hire a CSR Officer, publish stand-alone CSR reports, etc. (Khan *et al.*, 2013; Peters and Romi, 2014; Rodrigue *et al.*, 2013). This, therefore, supports the argument that audit committee financial expertise could enhance CESD.

Based on the above discussion, we expect a positive relationship between board's CSR orientation and CESD. Thus, our second hypothesis is that:

H2a. *The quantity of CESD is positively associated with board's CSR Orientation.*

H2b. *The quality of CESD is positively associated with board's CSR Orientation.*

3.3 CSR Committee

One of the main CG mechanisms is setting a specific committee (e.g., CSR committee)¹ to manage environmental issues from the perspectives of risks, strategic opportunities, meeting corporate sustainable goals, and commitments to stakeholders (Peters and Romi, 2015). Rodrigue *et al.* (2013) examine whether CSR committee does a substantial or symbolic role on environmental performance and disclosure. They assert that such committees emphasise avoiding reputational risk and litigation cost, and this affects the level of CESD. Among others, Liao *et al.* (2015) and Peters and Romi (2014) investigate the association between the presence of CSR committee and greenhouse gas emissions (GHG) disclosure. They find that GHG disclosure is positively related to the presence of CSR committee. In light of the above discussion, we expect that CSR committee is more likely to respond to stakeholders' demands for more CESD. Therefore, our third hypothesis is that:

H3a. The quantity of CESD is positively associated with the existence of CSR committee.

H3b. The quality of CESD is positively associated with the existence of CSR committee.

3.4 Issuance of Stand-alone CSR Reporting

CSR reporting is the process of disseminating information on the social and environmental performance in corporate annual reports, stand-alone reports and/or websites (Guthrie *et al.*, 2008; Robertson and Samy, 2015). CSR literature states that environmental reporting helps companies to resolve some of their damaged reputation and environmental problems and sustain good relationships with relevant stakeholders (e.g., Chauvey *et al.*, 2015; Patten and Zhao, 2014). Similarly, prior surveys in CSR reporting practices show a large increase in publishing stand-alone CSR reports which include environmental information (KPMG, 2013; Michelon *et al.*, 2015). For example, KPMG Survey (2013) report that the average sustainability reporting rate of the 100 largest companies in 41 countries (N100) has increased from 64% in 2011 to 71% in 2013. Empirically, Dhaliwal *et al.*'s claim that the issuance of a stand-alone CSR report is viewed as a sign of the quality of disclosure because it provides relevant and material information for investors to assess firms' CSR performance (Dhaliwal *et al.*, 2012, 2014). Other scholars argue that CSR reports are little more than public relations mechanisms developed by firms to legitimatise their existence (Unerman *et al.*, 2007) or to

¹ We are using CSR committee as a catchall name of such board committee. This committee may also be referred to as "social responsibility", "sustainability", "corporate ethics", "environmental", "health and safety", "sustainable development" committee.

manage the perceptions of the stakeholders (Thorne *et al.*, 2014). Based on the above debate, our final hypothesis is that:

H4a. The quantity of CESD is positively associated with the issuance of stand-alone CSR report.

H4b. The quality of CESD is positively associated with the issuance of stand-alone CSR report.

4. Research Design

4.1. Sample and Data Collection

Our sample comprises firms listed on the UK FTSE 100 for the fiscal year 2010; the FTSE 100 is one of the globe's best-known stock market indices and a bellwether for the UK economy. The UK was chosen because it has experienced high levels of environmental reporting practices (KPMG, 2013; Michelin *et al.*, 2015). We investigate environmental disclosure by analysing corporate stand-alone CSR reports, and when they were not publicly available, annual reports were used. Data on environmental governance and financial variables were manually collected from company annual reports or DataStream database. To ensure comparability of the results, companies with complete data for all study variables were used which led to a total sample of 94 firms. The sample distribution is presented in Table 1.

<INSERT TABLE 1 HERE>

4.2. Dependent variables - CESD disclosure

To quantify CESD, we developed a disclosure index based on the Global Reporting Initiative (GRI) sustainability reporting guidelines as an international benchmark (GRI, 2006) and prior studies. This index consists of 32 environmental disclosure items and six environmental categories: (1) environmental policy; (2) energy, and raw materials used (inputs); (3) environmental product- and process-related data (outputs); (4) environmental-financial data; (5) climate change and sustainability; and (6) environmental others (This appendix is available upon request). We then employed the widely used content analysis method to analyse CESD; this may include: page, paragraph, sentence or word counts (Beattie *et al.*, 2004; Gray *et al.*, 1995; Martinez-Ferrero *et al.*, 2016). Notwithstanding words and sentences count often being used as the most appropriate measures for determining the quantity, the assessment still resulted in non-narrative disclosures such as pictures, graphs, or charts being ignored (Van

Staden and Hooks, 2007), thus producing an inaccurate picture of the reporting. This study, therefore, scores the quantity of CESD (QUAN_ED) using the proportion of the page that conveys the space given to each environmental theme/item, reflecting the relative importance of reported theme(s).

For assessing the quality of CESD (QUAL_ED), we used a less subjective multi-dimensional quality model (MQM) developed by Helfaya (2012) for assessing the quality of environmental discourse. This MQM goes beyond the more traditional author-based disclosure indices, focusing on preparer- and user-based index that assesses quantity of CESD and captures a high level of content, credibility and communication of environmental information. The MQM measures the quality of CESD depending on three different complementary dimensions (3Cs): first, *Content* - CON_ED (weighted 56%) including four sub-dimensions: quantity (10%), themes (14%), measures of disclosure (16%), and types of information (16%). Second, *Credibility* - CRE_ED (weighted 31%) including two sub-dimensions: adopting external reporting guidelines (16%), and including third-party assurance (15%). Third, *Communication* - COM_ED (weighted 13%) including three sub-dimensions: tables (4.60%), graphs (4.40%), and images (4%).

Following MQM, we assigned a score for each sub-dimension of information as a preliminary process to calculate the quality disclosure score (QUAL_ED). Other than the quantity sub-dimension, the quality sub-dimensions were assessed using the developed index. Except for sub-dimensions of communication quality, a binary variable was used (1 or 0, depending on whether the item was disclosed or not). The total quality disclosure score is calculated by using the following formula and is then expressed as a percentage, ranging from the lowest (0%) to the highest (100%):

$$QUAL_ED_i = \sum (CON_ED_i + CRE_ED_i + COM_ED_i)$$

To enhance reliability of the research index, a preliminary check was performed on a sample of nine annual documents (Krippendorff, 2004). Coding was undertaken by the first researcher and was assessed by the second researcher for achieving greater accuracy and consistency (Krippendorff, 2004). The Cronbach's Alpha was also calculated to assess the internal consistency reliability of CESD scores (89.3%), which is above the appropriate minimum acceptable level (70%) (Cavana *et al.*, 2001).

4.3. Independent variables

The independent variables in our analysis are: board's CSR strategy, board's CSR orientation, CSR committee, and issuance of a standalone CSR report. We measure board's CSR strategy (BCSRS) through a board CSR strategy index developed by Thomson Reuters ASSET4 database. The index captures firm-level CSR policies and initiatives, with higher CSR strategy score indicating greater CSR-related activism of a firm and hence more proactive is its board-level CSR planning, oversight, and communication strategy. Following recent studies (Qiu *et al.*, 2016 and Shaukat *et al.*, 2016), we used the ASSET4 scores, namely indicators related to board strategy, which are regarded as one of the comprehensive leading databases on corporate social, environmental and governance information.

Additionally, we include board's CSR orientation (BCSRO) which is a composite measure consisting of board independence (INDED), board gender diversity (FEMD) and audit committee financial expertise (ACFEX). Board independence is a dummy variable equal to 1 if the majority of board members are independent and 0 otherwise. Gender diversity on the boards is a dummy variable equal to 1 when there is at least one female director on board and 0 otherwise. Audit committee financial expertise is a dummy variable equal to 1 when there is at least one member of the committee having financial expertise and 0 otherwise. Therefore, BCSRO uses a score of 0–3 to provide an indicator of the board-level CSR orientation. We also include CSR committee (CSRC) which is a dummy variable equal to 1 if a CSR committee exists and 0 otherwise. Stand-alone CSR report (SCSRR) is a dummy variable equal to 1 if the company issues a standalone CSR report and 0 otherwise.

4.4. Control variables

To avoid model misspecification, we control for additional variables that could influence the CESD practices. Following prior literature, we control for firm size (FSIZE) which is measured as the natural log of total assets (see D'Amico *et al.*, 2016; Liao *et al.*, 2015; Tauringana and Chithambo, 2015). We also control for firm profitability, measured by return on assets (ROA) (Brammer and Pavelin, 2008; Clarkson *et al.*, 2011). We account for the effect of firm leverage (LEV) on disclosure practices, measured through the ratio of long term debt to total assets (D'Amico *et al.*, 2016). In line with prior research (Tauringana and Chithambo, 2015), we also control for the effect of financial slack (SLACK). Firms with higher financial slack (measured as cash & short term investments, divided by total assets) are likely to invest in socially

responsible activities, including CESD. Moreover, capital expenditure (CAPEX), the ratio of capital expenditure to total assets, is also considered to be a factor that could affect the CESD (de Villiers et al., 2011; Tauringana and Chithambo, 2015).

Furthermore, we control for block shareholdings (SHOLD) which are measured as shareholdings of 5% or more. There is evidence suggesting that block shareholdings tend to further their own interests, rather than the interests of other stakeholders, leading to a decline in CSR related activism (Shaukat *et al.*, 2016). Accordingly, we expect negative association between block shareholdings and CESD. We also control for CEO duality (i.e. a dummy variable that equals 1 if the CEO simultaneously serves as the chairman and 0 otherwise). Finally, we also controlled for industry classification (IND) (ten groups).

4.5. Empirical model

We develop the following empirical model to test our hypotheses,

$$\begin{aligned}
 & \text{QUAN_ED, QUAL_ED, CON_ED, CRE_ED, COM_ED} \\
 & = \alpha + \beta_1 \text{BCSRS} + \beta_2 \text{BCSRO} + \beta_3 \text{CSRC} + \beta_4 \text{SCSRR} + \beta_5 \text{SHOLD} \\
 & + \beta_6 \text{DUALITY} + \beta_7 \text{FSIZE} + \beta_8 \text{ROA} + \beta_9 \text{LEV} + \beta_{10} \text{SLACK} \\
 & + \beta_{11} \text{CAPEX} + \beta_{12} \text{IND} + \varepsilon
 \end{aligned}
 \tag{1}$$

where QUAN_ED is the quantity of CESD score, QUAL_ED is the quality of CESD score, CON_ED is the content sub-index of CESD quality, CRE_ED is the credibility sub-index of CESD quality, COM_ED is the communication sub-index of CESD quality, BCSRS is board's CSR strategy, BCSRO is board's CSR orientation, CSRC is CSR committee, SCSRR is the issuance of a standalone CSR report, SHOLD is the block shareholdings, DUALITY is the CEO duality, FSIZE is the firm size, ROA is the return on assets, LEV is the firm leverage, SLACK is the financial slack, CAPEX is the capital expenditure, INDU is the industrial membership, and ε is the error term. The analysis is carried out using the OLS regression model. We also used the robust standard errors to ensure robust and valid statistical inference (Hoechle, 2007).

5. Results and discussions

5.1 Descriptive statistics and univariate analysis

Table 2 reports the descriptive statistics for all variables used in the regression model. It is evident that the firms disclosed, on average, 24.15% of the total report pages on CESD, with a minimum of 0.17% and a maximum of 100%, indicating wide variation in the quantity of environmental disclosure (QUAN_ED). We also find that the mean CESD quality score (QUAL_ED) is 46.08 %, with disclosures ranging from 9.16% to a maximum of 83.99%, indicating that the quality of CESD by FTSE 100 companies is still low. A review of the quality of disclosures with respect to the three sub-indices indicates that the quality of content (CON_ED), on average, is 26.68 out of 56, indicating that the content of CESD is largely non-financial and qualitative in nature with little use of different environmental themes, quantitative measures and different types of information (bad news, future looking information, etc.). Similarly, the credibility of CESD (CRE_ED), on average, is 15.68 out of 31, suggesting most of the firms adopted sustainability reporting guidelines or used assurance services. Interestingly, for the use of communication tools (e.g., graphs, tables and images), it seems that most of the CESD content is textual rather than visual (the average level of disclosure for COM_CD = 3.72 out of 13). These findings provide support for past evidence (Alrazi *et al.*, 2016; Tauringana and Chithambo, 2015), which that firms tend to disclose primarily non-financial and qualitative environmental information to gain and maintain corporate legitimacy.

Table 2 further shows that the mean value of board's CSR strategy (BCSRS) is 84.35%. We also find the board's CSR orientation (BCSRO) ranging from 0 to 3 with an average of 2.104. The mean values of independent directors (INDED) and financial expertise on audit committees (ACFEX) are 56.01% and 65.4%, respectively. This is similar to Shaukat *et al.* (2016) who reported a mean of 52 % board independence and 65% of audit committees having financial expertise. With regard to board gender diversity, we find the the percentage of female directors on boards (FEMD) is 12.6%. This is lower than the 14.1% reported in Al-Shaer *et al.* (2016) for their sample of 2012 FTSE350 firms, indicating that there has been a gradual increase in the percentage of women on boards in 2012 compared to 2010. We also find that on average, 68.75% of firms have a CSR committee (CSRC) and 74.75% of firms publish standalone CSR report (SCSRR). In addition, the mean value for block shareholdings (SHOLD) is 14.27%, CEO duality (DUALITY) is 2%, firm size (FSIZE) is £ 89.05 million,

profitability (ROA) is 6.76 %, leverage (LEV) is 18.15%, firm financial slack (SLACK) is 11%, and capital expenditure (CAPEX) is 4.17%.

<INSERT TABLE 2 HERE>

Table 3 shows the correlation matrix for variables used in our analysis. It is evident that quantity and quality of CESD are significantly and positively related to all independent variables, supporting hypotheses 1, 2, 3 and 4. Table 3 further shows low correlations among all the independent variables, implying that multicollinearity is unlikely to be a concern. We also examine the variation inflation factors (VIF) to test for the existence of multicollinearity (Gujarati, 2003). The results indicate that the VIF values are below 10, suggesting no serious collinearity in the examined models.

<INSERT TABLE 3 HERE>

5.2 Multivariate regression analyses

Table 4 shows the regression results examining the impact of board's CSR strategy, board's CSR orientation, CSR committee and issuance of stand-alone CSR report on the quantity and quality of CESD.

5.2.1 Board's CSR strategy (H1)

The results show that board's CSR strategy score has a significant and positive association with both CESD quality and credibility, but is not significantly associated with the quantity, content or communication of CESD. This only supports hypothesis *H1b* of a positive relationship between board's CSR strategy and the quality of CESD. Our evidence suggests that that firms respond to increased stakeholders' expectation through developing a proactive and comprehensive board's CSR strategy, which in turn leads to greater CSR-related activism and CESD quality. Specifically, we find boards with effective CSR strategy tend to disclose more reliable and useful environmental information to stakeholders through the use of the GRI guidelines and independent external assurance. This result is consistent with the findings of previous studies (e.g., Al-Tuwaijri *et al.*, 2004; Clarkson *et al.*, 2011; Hart, 1995; Martensson and Westerberg, 2016) that indicate that CSR strategy has a positive effect on organisational outcomes. Shaukat *et al.* (2016) also find a positive association between firm's CSR strategy

and environmental and social performance. It also provides further empirical support for our multi-theoretical framework that integrates insights from stakeholder, legitimacy, and RDT theories. For instance, board's CSR strategy can help to manage stakeholders' interests with regard to CSR disclosure (stakeholder theory), gain and maintain corporate legitimacy licences and reputation (legitimacy theory), and facilitate access to resources (RDT).

5.2.2 Board's CSR orientation (H2)

The results indicate a significant positive relationship between the composite measure of board's CSR orientation and the quality of CESD as well as its components (content, credibility and communication), rather than its quantity. This suggests that boards with more independent directors, female directors and audit committees' directors with financial expertise, are likely to adopt environmentally responsible activities and disclose higher quality of CESD. Hence, *H2a* is rejected but *H2b* is confirmed. This result is consistent with prior studies (e.g., Arena *et al.*, 2015; Cheng and Courtenay, 2006; Hillman *et al.*, 2002; Jo and Harjoto, 2011; Khan *et al.*, 2013). Liao *et al.*, (2015) found independent and diversified boards are positively associated with carbon disclosures. Al-Shaer and Zaman (2016) also found that gender diverse boards are associated with higher quality sustainability reports of UK firms. This evidence is consistent with the stakeholder theory in that diversified and independent boards and audit committees' directors with financial expertise are more likely to make a balance between a firm's financial and non-financial goals and put pressure on managers to respond to stakeholder concerns related to environmental activities (Deegan, 2007; Hanniffa and Cooke, 2005), and then disclose more useful environmental activities (Khan *et al.*, 2013). Additionally, RDT suggests that more independent, female directors and audit committee directors' financial expertise can attract crucial resources such as human and relational capital, which in turn improves firms' long-term sustainability including CSR reporting.

5.2.3 CSR committee and stand-alone CSR report (H3 & H4)

The results indicate that the existence of CSR committee (CSRC) and the issuance of stand-alone CSR report (SCSRR) are positively and significantly associated with the quantity and quality of CESD and its content and communication but not significantly associated with the credibility of CESD, thus confirming hypotheses H3 and H4. A possible explanation is that the CSR committees are mainly responsible for overseeing the firm's management of CSR which might lead to more extensive CESD for the firm. Regarding the issuance of the stand-alone CSR report, the results support the notion that firms need to legitimise its performance and

manage the perception of stakeholders (Michelon *et al.* 2015). This is consistent with previous studies (Dhaliwal *et al.*, 2011, 2012, 2014; KPMG, 2013; Patten and Zhao, 2014). The positive relationship implies that the existence of CSR committee and publishing stand-alone CSR report are two of the main corporate environmental governance mechanisms to address environmental risks and engage with interested stakeholders (Mahoney *et al.*, 2013; Peters and Romi, 2014, 2015). This, therefore, will lead to more emphasis on avoiding any reputational risk and expected litigation cost, and improving the quantity and quality of CESD. This result is in line with our multi-theoretical framework that suggests that firms adopt these CG mechanisms as public relations' tools to legitimise their existence (e.g., Mahoney *et al.*, 20013; Mallin *et al.*, 2013), and manage the perceptions of the relevant stakeholders (Thorne *et al.*, 2014).

<INSERT TABLE 4 HERE>

5.3. Additional analyses

We carry out two additional analyses to ascertain the robustness of our results. Firstly, we further investigate the effect of board's CSR strategy and orientation on the quantity and quality CESD when corporate environmental risks differ. Prior empirical studies indicate that CESD is influenced by the level of environmental risk of companies (i.e. sensitivity to the environment) (Brammer and Pavelin, 2008; Cuganesan *et al.*, 2010; Helfaya, 2012; Tauringana and Chithambo, 2015). Thus, we re-run Eq. (1) by splitting our sample into high environmentally sensitive industries (HESI) and low environmentally sensitive industries (LESI). A number of interesting results emerge from the additional analysis (not tabulated): First, and consistent with our findings in Table 4, BCSRS has a significant positive effect on CESD (i.e., quality and credibility) for LESI, but not significant for HESI. Second, CSR committee, with respect to HESI, is positively related to all disclosures, but only the coefficient on (QUAN_ED) is statistically significant. In contrast, the effect is positive and significant in LESI, implying that a board with CSR committee is more likely to provide a better connection with stakeholders, and enhance corporate legitimacy and reputation. These results also suggest that board's CSR strategy and CSR committee play a more pronounced CESD role by acting as a substitute for statutory control in LESI. Third, except for (CON_ED), board's CSR orientation (BCSRO) is significantly positively related to all disclosures in HESI, whereas in LESI the coefficient of BCSRO is significant with the quality and credibility of CESD. These

results are consistent with stakeholder theory, suggesting that a strong board orientation toward environmental accountability is more likely to be more environmentally responsive, thereby leading to more CESD.

Secondly, to examine whether our results are sensitive to the board's CSR orientation proxy employed, we replicate our results in Table 4 by using an alternative measure which is a measure of the average of Z-scored of (i) % of independent directors; (ii) % of female directors; and (iii) % of audit committee financial expertise. Noticeably, the results (not tabulated) are consistent with our earlier results.

6. Conclusions

This study investigates the effects of board's CSR strategy, board's CSR orientation, CSR committee and issuance of a stand-alone CSR report on the quantity and quality of CESD. Based on sample of the UK FTSE100 firms, we find that effective board's CSR strategy and CSR-oriented boards have a positive and significant impact on the quality of disclosure, rather than its quantity. Our findings also suggest that the presence of CSR committee and issuance of stand-alone CSR report are positively and significantly related to CESD. These results lend support to legitimacy, stakeholder and resource dependence theories (Mallin *et al.*, 2013). For CSR-related RDT, the board of directors and sustainable strategies could be seen as unique governance mechanisms which help firms disclose high-quality information on environmental performance (Mallin and Michelon, 2011; Shaukat *et al.*, 2016). Moreover, these board's attributes are more likely to seek environmental legitimacy and high stakeholders' satisfaction via disseminating useful environmental information (e.g., Axjonow *et al.*, 2016; Michelon *et al.*, 2015). This study contributes to the literature by providing empirical evidence of board's CSR strategy and orientation for disseminating high quality of CESD in UK context. The study is also innovative in employing a less subjective multi-dimensional quality model for assessing the quality of CESD.

Our findings have several implications for a number of constituencies. For corporate directors, our results support earlier recommendations in CSR literature that the quality of reporting is a multifaceted concept covering many features such as quality of content, credible content using reporting guidelines and assurance services, and readable content using visual tools (e.g., Helfaya and Kotb, 2016; Michelon *et al.*, 2015). Firms should also consider the beneficial

effects of having CSR-oriented directors and board's CSR strategy on their environmental performance. For policy-makers and regulators, our results of a positive link between board's CSR strategy and orientation and the credibility of CESD are mainly relevant as these raise concerns about the reliability of CESD (i.e., adopting reporting guidelines and assurance service). This link is indicative of the trust gap between CSR reporters and users. To decrease this gap, policy-makers and regulators need to set a commonly agreed set of CSR reporting guidelines and assurance standards. Additionally, having women on board brings several advantages to companies; they present new ideas, long-term success, and appear on the multiple 'best' sustainable ranks (Al-Shaer and Zaman, 2016; Brammer *et al.*, 2007; Landry *et al.*, 2016). Regulators and policy-makers could set or reform CG regulations to enhance the board composition and to encompass all aspects of diversity such as gender, age, ethnic group, and educational level. For CSR Scholars, the multi-theoretical perspective and the MQM used in this study could be used to conduct future investigations of the board features and CSR/CG disclosure and performance.

This paper is subject to some limitations as well as future research implications. First, we examine CESD in the UK for a single year. Future research, therefore, could encompass a longitudinal and cross-country sample to provide evidence for the broader applicability of these findings. Second, our analysis is limited to CESD made only in standalone CSR reports or annual reports. Further research might address this issue and focus on examining other outlets of corporate communication such as online reporting (e.g., Li, 2010; Robertson and Samy, 2015). Third, this study also used female directors as a measure of board diversity but does not account for the other measures of diversity. So, future studies could also examine other measures of diversity such as: age, educational level, experience and ethnic group (Seto-Pamies, 2015). In spite of the above limitations, this study contributes to the literature by providing evidence that board's CSR strategy and orientation have a significant positive association with the quality of CESD practices.

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Table 1: Sample distribution

Panel (A) Sample selection	
UK FTSE 100 companies	100
Less	
Firms with missing stand-alone CSR reports/annual reports or complete data	(6)
Total final sample	94

Panel (B) Industry composition	
Industry	Number of firms (%)
Oil and Gas	7 (8)
Basic Materials	11(12)
Industrials	13(14)
Consumer Goods	8 (9)
Health Care	4 (4)
Consumer Services	15(16)
Telecommunications	4 (4)
Utilities	6 (6)
Financials	22 (23)
Technology	4 (4)
Total	94 (100)

Table 2: Descriptive statistics

Variables	Mean	Median	Std. Dev.	Min.	Max.
QUAN_ED (%)	24.15	25	18.63	.17	100
QUAL_ED (%)	46.08	45.18	21.02	9.16	83.99
CON_ED	26.68	27.66	8.02	5.1	43.01
CRE_ED	15.68	16	13.74	0	31
COM_ED	3.72	3.44	3.01	0	13
BCSRS (%)	84.35	91.85	15.88	9.96	94.37
BCSRO	2.104	2	0.8643	0	3
INDED (%)	56.01	54.11	15.01	24.17	91.36
FEMD (%)	12.60	11.11	9.74	0	42.86
ACFEX (%)	65.40	73.9	22.60	5.92	73.90
CSRC	0.6875	1	0.4660	0	1
SCSRR	0.7475	1	0.4367	0	1
SHOLD (%)	14.27	7	19.42	0	79
DUALITY	0.0204	0	0.1421	0	1
FSIZE (£b)	89.05	9.131	278.17	1.01	1576.30
ROA (%)	6.76	5.99	5.57	-4.69	29.15
LEV (%)	18.15	16.65	14.24	0	55.16
SLACK (%)	11.00	8.099	10.86	.81	66.53
CAPEX (%)	4.17	2.607	4.32	0	20.60

Notes: Variables are defined as follows: quantity of environmental sustainability disclosure score (QUAN_ED); quality of environmental sustainability disclosure score (QUAL_ED); content sub-index of environmental sustainability disclosure quality (CON_ED); credibility sub-index of environmental sustainability disclosure quality (CRE_ED); communication sub-index of environmental sustainability disclosure quality (COM_ED); board's CSR strategy (BCSRS); board's CSR orientation (BCSRO); board independence (INDED); board gender diversity (FEMD); audit committee financial expertise (ACFEX); CSR committee (CSRC); issuance of a standalone CSR report (SCSRR); block shareholdings (SHOLD); CEO duality (DUALITY); firm size (FSIZE); return on assets (ROA); firm leverage (LEV); financial slack (SLACK); and capital expenditure (CAPEX).

Table 3: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
QUAN_ED (1)	1.00															
QUAL_ED (2)	0.62 (0.00)	1.00														
CON_ED (3)	0.78 (0.00)	0.84 (0.00)	1.00													
CRE_ED (4)	0.30 (0.00)	0.90 (0.00)	0.54 (0.00)	1.00												
COM_ED (5)	0.85 (0.00)	0.62 (0.00)	0.72 (0.00)	0.31 (0.00)	1.00											
BCSRS (6)	0.40 (0.04)	0.45 (0.00)	0.41 (0.00)	0.36 (0.00)	0.36 (0.08)	1.00										
BCSRO (7)	0.25 (0.01)	0.47 (0.00)	0.32 (0.00)	0.47 (0.00)	0.27 (0.00)	0.10 (0.33)	1.00									
CSRC (8)	0.44 (0.00)	0.63 (0.01)	0.62 (0.20)	0.50 (0.00)	0.46 (0.00)	0.48 (0.00)	0.21 (0.04)	1.00								
SCSRR (9)	0.69 0.00	0.64 0.00	0.69 0.00	0.43 0.00	0.66 0.00	0.51 0.00	0.18 0.08	0.47 0.00	1.00							
SHOLD (10)	-0.06 (0.58)	0.07 (0.49)	0.07 (0.51)	0.06 (0.54)	0.02 (0.85)	-0.11 (0.29)	-0.13 (0.22)	0.15 (0.16)	-0.11 (0.27)	1.00						
DUALITY (11)	0.21 0.04	-0.02 0.83	0.03 0.81	-0.08 0.44	0.14 0.17	-0.03 0.74	0.15 0.14	-0.06 0.57	-0.08 0.43	-0.01 0.89	1.00					
FSIZE (12)	0.00 0.96	0.16 0.12	0.06 0.58	0.21 0.03	-0.03 0.75	0.15 0.14	0.10 0.32	0.17 0.10	0.12 0.24	0.11 0.27	-0.04 0.69	1.00				
ROA (13)	-0.11 (0.26)	0.00 (0.97)	-0.05 (0.61)	0.06 (0.52)	-0.13 (0.19)	-0.11 (0.26)	0.07 (0.47)	-0.04 (0.70)	-0.17 (0.10)	0.18 (0.08)	0.00 (0.98)	-0.32 (0.00)	1.00			
LEV (14)	0.10 0.35	0.08 0.46	0.19 0.06	-0.03 0.78	0.15 0.14	0.13 0.22	0.04 0.73	0.08 0.45	0.15 0.13	-0.22 0.03	0.15 0.13	-0.20 0.05	-0.05 0.60	1.00		
SLACK (15)	-0.19 0.07	-0.18 0.08	-0.23 0.02	-0.11 0.30	-0.15 0.14	-0.08 0.43	-0.17 0.09	-0.06 0.54	-0.13 0.19	0.09 (0.40)	-0.06 (0.53)	-0.17 (0.09)	0.16 (0.13)	-0.13 (0.20)	1.00	
CAPEX (16)	0.01 (0.92)	0.04 (0.68)	0.01 (0.93)	0.06 (0.54)	-0.01 (0.90)	0.05 (0.60)	0.03 (0.75)	0.12 (0.23)	-0.09 (0.37)	0.26 (0.01)	0.10 0.35	-0.23 0.02	0.33 (0.00)	0.00 (0.99)	0.01 (0.96)	1.00

Notes: Table 2 fully defines all the variables used. P-values are in parentheses.

Table 4: OLS regression results of CESD

Indep. and control variables (Model)	Expected Sign	QUAN_ED (1)	QUAL_ED (2)	CON_ED (3)	CRE_ED (4)	COM_ED (5)
BCSRS	+	.043	.208**	.063	.242***	-.001
BCSRO	+	.134	.296***	.194**	.275***	.163*
CSRC	+	.412**	.566***	.594***	.248	.478**
SCSRR	+	1.234***	.728***	.878***	.225	1.283***
SHOLD	+/-	-.092	-.202**	-.197*	-.163	.210*
DUALITY	+/-	.521	-.316	.252	-.430*	.706
FSIZE	+/-	-.050	-.043	.040	-.004	-.046
ROA	+	.072	.045	.078	.024	-.025
LEV	+	.008	.006	.001	-.006	.039
SLACK	+	.014	.031	.016	.007	.056*
CAPEX	+	.011	.031*	.012	.023	.007
Industry effects		Included	Included	Included	Included	Included
Intercept		-1.231***	-.758***	-1.163***	.174	-1.670***
<i>R-squared</i>		0.69	0.75	0.68	0.66	0.68
<i>F-Statistic</i>		11.46***	10.84***	10.75***	19.35***	12.50***
<i>VIF</i>		2.11	2.11	2.11	2.11	2.11
<i>N</i>		94	94	94	94	94

*, **, and *** indicate significance at 1%, 5%, and 10%, respectively (all two tailed).

All variables are fully defined in Table 2.