

Corporate Environmental Disclosure and Earnings Management: UK Evidence

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Abstract

This paper examines the relationship between corporate environmental disclosure (CED) and earnings management (EM) of 245 UK non-financial companies for the period between 1 April 2006 and 31 March 2007. Three different theoretical frameworks are used to identify the expected association between CER and EM. These include: signalling theory, agency theory and stakeholder-legitimacy theory. We find no significant statistical association between various measures of discretionary accruals and environmental disclosure. This result suggests that UK corporate managers are not using environmental disclosure as a technique to reduce the probability that public policy actions will be taken against their companies (Patten and Trompeter, 2003). We also find that some corporate governance attributes affect the relationship between CER and EM.

Key words: Corporate Environmental Disclosure; Earnings Management.

1. Introduction

Societal concern tends to be recognised as a significant corporate responsiveness to communicate between organisations and the society with regard to social responsibility and sustainability. According to Gray *et al.* (1995), corporate social and environmental disclosure might be treated as a legitimate and social contribution made by the organization. However, due to imperfect auditing in the real world of economy, managers have incentives to take discretionary actions over reported income to maximise their own benefit. Healy and Wahlen (1999: 366) argue that earnings management (EM) exists when managers either “mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers”.

The purpose of the current paper is to investigate the association between corporate environmental disclosure (as a measure of corporate social responsibility) and earnings management. In particular, we are interested in answering the following research question: “What is the relationship between corporate environmental disclosure (CED) and earnings management (EM)?”

Prior research has concentrated either on the relationship between corporate social responsibility (CSR) and corporate financial performance (CFP), indicating that financial and economic performance of an entity has a positive connection with its social responsibility (Ullman, 1985; McGuire *et al.*, 1988; Salama, 2005); or on the association between EM and corporate governance (CG), predicting that the reliability and quality of accounting earnings will be enhanced when managers’ opportunistic EM behaviour is monitored by corporate governance mechanisms (Wild, 1996; Dechow *et al.*, 1996; Klein, 2002). In other words, the research has failed to explore the direct link between CSR and EM and the impact of CG on the association between the two variables. Only recently have Chih *et al.* (2008) and Prior *et al.* (2008) empirically identified the exact relation between CSR and EM, based on international data.

Furthermore, the UK government has recently claimed that environmental reporting is deemed to be crucial in corporate reporting and companies must now report essential environmental issues in their annual reports and accounts under the amendment of the Companies Act 2006. Managers have incentives to voluntarily disclose environmental information in order to attract existing or potential investors and to enhance the corporate image of their company, especially when they attempt to engage in earnings management. Agency conflict exists when managers opportunistically manipulate EM in their own favour; hence, CED, which is a means to secure their jobs, can also be used to distract shareholders' attention from monitoring EM activities. It seems that managers involved in EM practice are motivated to behave in a proactive way by seeking perceptions from shareholders and diverse groups of stakeholders that they are taking actions to secure optimal performance. Thus, voluntary disclosure in annual reports, such as CED, is deemed necessary to demonstrate to stakeholders the company's awareness of wider interests and its accountability to behave in a socially responsible manner.

The rest of our article is organised as follows. Section 2 critically reviews relevant literature, including the relation between CSR and CFP; the relation between EM and CG; and a detailed review of the two key papers on the exact association between CSR and EM. Section 3 presents the theoretical framework and the development of the research hypotheses. Section 4 describes sample selection, data collection and the research methodology. Descriptive analysis, correlation analysis and the empirical results are reported in Section 5. Section 6 concludes the discussion and provides suggestions for further research.

2. Literature Review

Our paper aims to investigate the relationship between corporate environmental disclosure (CED) and earnings management (EM). Therefore, we begin our literature review by discussing empirical studies that are concerned with the association between CSR and CFP and the association between EM and CG. There has been lively research since the 1960s on a firm's CSR coupled with its financial and economic performance. Early theoretical research concentrated on the trade-off between CSR and CFP.

Bowman and Haire (1975) and Alexander and Bucholtz (1978) argue that firms acting in a socially responsible way may give a positive impression to diverse groups of stakeholders. Early stakeholder theory cited that, although CSR activities are very costly, firms will obtain reductions in other explicit costs.¹

Following that, Ullman's (1985) seminal paper pioneered legitimacy theory in relation to powerful stakeholders. CSR actions and activities are expected to improve relationships with shareholders and other groups of stakeholders. Building a satisfactory reputation for the enterprise is strategic to sustaining relationships with different stakeholders and to improving access of capital financing; in other words, the financial and economic performance of an entity has a positive connection with its social responsibility (Ullmann, 1985; McGuire *et al.*, 1988; Salama, 2005).

Based on the framework of the relationship between CSR and CFP, there are two types of empirical research. On the one hand, abnormal returns measured as the short-run financial impact is used in the event studies. Notwithstanding the rather mixed empirical results, it has been frequently exploited in the 1990s.²

On the other hand, scholars and researchers have drawn greater attention to the relation between corporate social performance (a measure of CSR) and profitability (a measure of long-term firm performance). For instance, Aupperle *et al.* (1985) claims that CSR actions have neutral effects on profitability. However, McGuire *et al.* (1988) find that prior return on assets (proxies for profitability) with risks is more closely related to corporate social performance than to subsequent performance.³ Nevertheless, McWilliams and Siegel (2000) conduct the whole firm-level index of CSR regression analysis and argue that there is no relationship between CSR and CFP. Although their statement is consistent with Aupperle *et al.* (1985), they imply that the conflicting

¹ See Moskowitz (1972); benefit from employee ethical credibility and reliability will offset minimal costs of CSR.

² For example, Posnikoff (1997) finds that CSR activities in terms of divestment from South Africa have enhanced shareholder wealth, indicating CSR and its financial performance are positively correlated. Wright and Ferris (1997) report a negative relationship; and Teoh *et al.* (1999) confirm no relationship between the two variables.

³ They measure corporate performance in the form of accounting and stock-market-based interpretations in conjunction with risk factors. Following that, Waddock and Graves (1997) comment that CSR is in an effect to enhance corporate performance.

empirical outcomes might result in flaws of measure of CSR.⁴

In addition, managers should use financial reporting to send relevant information about the firm's underlying economic performance to those outside the entity, if they act in the interests of the firm performance. However, due to imperfect auditing in the real world of economy, managers may have incentives to manage earnings opportunistically. Discretionary accruals, therefore, capture the reliability of actual accounting earnings as an indicator of a firm's financial and economic performance.

According to Healy and Wahlen (1999: 366), EM exists when managers either "mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers". In other words, due to information asymmetry, managers may engage in earnings management or convey information about the firm's future performance to the insiders (management and directors) in the form of financial reporting (Christie and Zimmerman, 1994; Healy and Palepu, 1993; Leuz *et al.*, 2003).

It is argued that the reliability and quality of accounting earnings are enhanced when managers' opportunistic manipulation is monitored by corporate governance (Wild, 1996; Dechow *et al.*, 1996; Klein 2002). There are three major factors that influence corporate activities with respect to the link between corporate governance (CG) and EM: managerial ownership, board composition and audit quality.

Governance regarding the compensation of directors and managers aims to motivate managers to behave in the best interests of shareholders and monitoring management leads to a reduction of agency conflicts. Looking back to Jensen and Meckling's (1976) agency theory, it is indicated that managers with lower firm ownership have more motives to produce reliable accounting earnings that reflect the true economic value of the firm. Jensen (1989) additionally predicts that outside directors with little ownership stake in the firm have less incentive to constrain managers. Equity-based compensation

⁴ Most of the empirical research is limited to the U.S. setting.

is a governance device that attempts to reduce its potential to engage in EM. Warfield *et al.* (1995) also report a negative relationship between stock ownership and abnormal accounting accruals⁵.

Conversely, Klein (1998) claims that board compensation has no impact on a firm's performance but suggests that the structure of the committee does have an effect. The independence of boards is cited as having a negative association with earnings manipulation. The more independent the board, the less likely it is to report abnormal earnings.⁶ Consistent with Davidson *et al.* (1998), Xie *et al.* (2003) argue that independent outside directors are an important mechanism for dealing with agency conflicts. Also, audit committees with financial expertise are expected to have large composition should be large enough to effectively monitor EM.⁷

The arguments put forward so far have typically concentrated either on the association between corporate social responsibility (CSR) and corporate financial performance (CFP) or between corporate governance (CG) and earnings management (EM). However, most of the literature has failed to explain the direct link between CSR and EM and the impact of CG on the association between the two variables. The following paragraphs review the key articles on the relationship between CSR and EM.

Recently, empirical studies by Chih *et al.* (2008) and Prior *et al.* (2008) have attempted to identify the exact link between CSR and EM. According to Chih *et al.* (2008), the principles of CSR reporting should be providing financial transparency and accountability to all levels of stakeholders, provided that EM is detected in terms of CSR practices. This is consistent with the view of Prior *et al.* (2008) that managers engaging in earnings manipulations, could compensate by involving in CSR activities. Given that there is informational asymmetry between insiders (managers and directors) and outsiders (shareholders and stakeholders); discretionary accruals capture the reliability of a firm's financial and economic performance.

⁵ Their results have been consistent with the prior theory that managerial shareholding is viewed as an effective mechanism in aligning the interests of executives and shareholders.

⁶ Klein (2002) also provides evidence with respect to the importance of audit committee. The independent outside directors on audit committee efficiently prevent opportunistic manipulation of the financial reporting process.

⁷ They consider earnings management as an agency cost.

Additional research on the relation between CSR and EM has contributed to Gelb and Strawser's (2001) examination of the relationship between a firm's disclosures and CSR. The positive association between the two variables indicates that firms undertaking CSR actions are more likely to provide extensive and informative disclosures. Motivated by the previous relevant research, Chih *et al.*'s (2008) unique investigation explores, empirically, the relationship between CSR and EM with respect to investor protection.

Chih *et al.* (2008) select a sample of 1,653 companies in 46 countries to examine the relationship between CSR and EM. One group is all companies that issue CSR reports, that feature in both the FTSE All-World Developed Index (Global) and the FTSE4Good Global Index; and the other is a Non-CSR group, with companies included in the first Index but not the latter one. EM has been categorised by three measures: earnings aggressiveness, loss avoidance and earnings smoothing.⁸ Chih *et al.* (2008) argue that these three attributes inevitably moderate the relationship between true accounting performance and the firm's underlying economic performance, and that the relationship between CSR and EM depends upon which earnings cloudiness managers exploit.

In their econometric model, they investigate whether CSR has an effect on the extent to which companies engage in earnings manipulations, so EM is treated as a dependent variable and CSR as an explanatory variable. In order to enhance the reliability of their research, some control variables are incorporated in the model: firm size measured by total assets; the corporation's future growth measured by market-to-book ratio; and the firm's leverage measured by debt-to-equity ratio. The key variable of investor protection is used as a proxy for governmental governance, as it has an impact on the quality of earnings reporting to the outside stakeholders. Audit quality, as a dummy variable, is also incorporated in the model.

Chih *et al.* (2008) find that there is a negative relation between EM and CSR when earnings smoothing or earnings losses avoidance is an indicator of EM. It predicts that

⁸ See Bhattacharya, U., H. Daouk and M. Welker (2003) The world price of earnings opacity, *The Accounting Review*, 78, pp. 641-678.

these CSR companies not only concentrate on income increasing activities but also upon stakeholder management. They conclude that when EM proxies as earnings smoothing, firms with more CSR actions are expected to reduce the likelihood of earnings smoothing and they argue that this applies even in a poor country. They also find that large firms with better quality audit are more likely to make disclosures rather than to manipulate earnings.

However, when EM is measured by earnings aggressiveness, the multiple objectives hypothesis holds, which implies a positive relationship between CSR and EM. Further, the institutional hypothesis, which states that CSR is unrelated to EM, is rejected, even though there are non-ethical incentives to engage in EM, such as “auditor acquiescence and growth in equity-based compensation”.⁹

Chih *et al.* (2008) make the inconclusive comment that a firm with CSR shows considerably less tendency to undertake earnings aggressiveness in a country with strong investor protection. They do not provide a clear answers on the extent to which investor protection influences the link between CSR and EM and the role played by the investor relationship in companies with both CSR activities and earnings management practices. Since other governance attributes have impacts on shareholders’ perception, and non-ethical incentives affect the relationship between CSR and EM, additional control variables should be incorporated in the econometric model with respect to earnings reliability.

Apart from the above literature, Prior *et al.* (2008) devote considerable attention to stakeholder-agency theory and corporate governance. They provide a different point of view in that CSR is treated as a dependent variable in their model, indicating a positive association with EM. The hypothesis is that when managers pursue their own benefit in opportunistically managing earnings, there are more incentives for them to seek more CSR practices. CSR is an entrenchment strategy to regain support from stakeholders, whose interests are damaged by earnings management. They also incorporate corporate

⁹ Chih, Hsiang-Lin, Chung-Hua Shen, and Feng-Ching Kang (2008) Corporate social responsibility, investor protection, and earnings management: some international evidence, *Journal of Business Ethics*, 79, pp. 179-198.

financial performance (CFP) into the relationship, and argue that the positive relationship between CSR and CFP is negatively mitigated when earnings manipulation is included.

Prior *et al.* (2008), following Healy and Wahlen (1999), identify three incentives for earnings management: capital market, contractual arrangements and regulatory motivations. They exploit agency theory and stakeholder theory to explain the consequences of earnings management and the connection between CSR and EM. Managers may use discretions to affect short-term share prices in the pursuit of self-interest benefit; in other words, they may convey private information to the stock market about the firm's future economic performance. Because managers need to safeguard their own job security and also face pressures from other stakeholders, they engage in earnings management for their own benefit. Earnings management serves an agency cost, resulting from the conflicts between managers and owners and between managers and other stakeholders.

They also introduce corporate governance as along with CSR reporting. They believe that the strategic use of CSR inevitably enhances perceived legitimacy, reinforces the monitoring of the top management and increases the efficacy of the governance system. In turn, these factors influence corporate financial performance (Luoma and Goodstein, 1999). According to Jensen (2001), when managers act as agents of non-shareholder stakeholders, especially when stakeholders share power of corporate control, the strategic behavior of CSR can be regarded as an entrenchment initiative as a consequence of earnings manipulation. They also argue that a good relationship with different stakeholders reinforces corporate financial performance. However, if firms engage in CSR activities as a result of earnings management, the positive impact of CSR on corporate financial performance is diminished.

Prior *et al.* (2008) test their hypotheses using two econometric models: one tests CSR and the other tests CFP, with earnings management as the main independent variable. Their data is based upon 593 companies from 26 countries for the year 2002-2004. In their

paper, discretionary accrual¹⁰ is a proxy for earnings management. By differentiating itself from Jones model¹¹, it has enhanced the reliability of inferences in the EM literature. Income smoothing, which is defined differently from Chih *et al.* (2008), is used as a different variable to detect earnings management. CSR is measured as scores from SiRi ProTM data in terms of eight research fields, such as business activities and corporate social responsibility actions. They find that CFP is an important control variable when examining the association between CSR and EM. Prior *et al.* (2008) provide points of view that differ from those of Chih *et al.* (2008). They argue that when managers act in their own favour in opportunistically managing earnings, there are more motives to engage in more CSR activities. In addition, they suggest that CSR is viewed as an entrenchment device to garner support from other groups of stakeholders, whose interests are damaged by EM practices. Corporate governance (CG) as a monitoring system is a strategic mechanism to reinforce or repair organisational legitimacy. Therefore, companies are motivated to commit to CSR practices, such as voluntary, corporate, social and environmental disclosure reactions; in turn, these will influence corporate financial performance. However, they comment that if firms engage in CSR activities as a consequence of earnings manipulation, the positive impact of CSR on CFP will be negatively mitigated.

3. Theoretical frameworks and hypotheses development

Three theoretical perspectives can be used to explain the potential association between CED and EM. These include signalling theory, agency theory and stakeholder-legitimacy theory.

Signalling theory

Market efficiency¹² assumes, to some extent, that, at any given time, investors are rational and that prices efficiently incorporate all the available information, depending upon a particular stock or market. Nonetheless, due to information asymmetry between management and stakeholders, managers act in their own favour to choose accounting

¹⁰ Use module from: Kothari, S. P., Leone, A. J. and Wasley, C. E. (2005) Performance matched discretionary accrual measures, *Journal of Accounting and Economics*, 39, pp. 163-197.

¹¹ Jones, T. M. (1995) Instrumental stakeholder theory: a synthesis of ethics and economics, *Academy of Management Review*, 20, pp. 404-437.

¹² See Market Efficient Hypothesis (EMH) in E. F. Fama: Efficient Capital Markets: A Review of Theory and Empirical Work, *Journal of Finance*, 25, pp. 383-417 (May 1970).

methods and estimates and, in turn, might conceal the firm's true economic value.

Prior *et al.* (2008) argue that managers may adopt discretionary actions to manage earnings in an attempt to convey favourable or unfavourable information about the firm's future prospects to the capital markets¹³. Earnings manipulation can indicate to investors the likelihood of better earnings and cash flows in the future.

As a result of market information asymmetry, companies may use corporate financial reporting to signal to investors that they hold some favourable information. Managers have incentives to voluntarily disclose additional accounting information as a signal to attract existing or potential investors and to enhance positive corporate images, especially when they attempt to engage in earnings management.

Gray (2005) comments that a company making corporate environmental disclosure (CED) as one of its CSR activities is predominantly concerned with signalling the quality of its management. High quality organisations tend to use corporate social and environmental accounting as a diversion to traditional financial reporting; on the other hand, low quality organisations choose non-disclosure, consistent with constrained accounting information. He further argues that the quality of financial reporting is a signal to financial markets and other stakeholders that the management can be perceived as able to control the social and environmental risks within the firm.

Additionally, corporate environmental disclosure is signalling to investors and other powerful and economic stakeholders that the company is actively taking part in CSR practices and that its market value is in a good position. Good corporate social performance helps a company to gain a reputation for reliability from capital markets and debt markets. Earnings management bears certain risks for the firm's future prospects; and outsiders (investors and stakeholders) will take disciplinary action against managers if earnings management is substantially detected. From a manager's point of view,

¹³ The opportunity to manage reported earnings captures the firm's cash flows and changes in corporate market value, which are discretionary from current cash flows.

corporate environmental disclosure is a signal that deflects shareholders' attention from issues on which managers might be punished.

Agency theory

It is argued that there are a number of overlaps between signalling theory and agency theory as a consequence of significant similarities between the two theories¹⁴. Agency theory explains further signalling perspectives. Agency conflict exists when managers (agents) undertake opportunistic actions, such as earnings management, to maximise their own interests. Managerial actions can mislead stakeholders about the firm's corporate market value and financial position, and cause outsiders to make false economic decisions. Earnings management is, therefore, an agency cost. (Zahra *et al.*, 2005 and Xie *et al.*, 2003)

On the other hand, Dechow *et al.* (1996) claim that when earnings management is suspected, the firm's value will immediately be reduced on stock market. Hence, EM can have an effect on a firm's share price, and in turn, share price will be damaged as a consequence of earnings management disclosed in more transparent reporting. Agency theory suggests that firms may use different methods, such as compensation plans or voluntary disclosures, to reduce conflicting interests between managers and shareholders. CSR requires a company to be accountable to its multi-levels of stakeholders and to report sustainability for business development on a voluntary basis. CED, as a CSR action, is a signal which can aim to divert shareholders' attention from monitoring earnings manipulation to other issues, and share price will be enhanced as a result.

Managers are interested in short-term business performance, so they expect to achieve a positive share price effect. Furthermore, regarding CED, a satisfactory corporate reputation and improved relationships with different stakeholders can be converted into access to capital financing (McGuire, 1988). Since, it is argued, building a satisfactory reputation is strategic to managing shareholders' impressions, investment in a good enterprise reputation may reinforce a firm's competitive advantage and, thus, maximise

¹⁴ See R. D. Morris (1987) Signalling, agency theory and accounting policy choice, Accounting and Business Research, 18 (4), pp. 47-56.

shareholders wealth. It will additionally lead to retain superior profits in capital markets (Salama, 2005).

CSR activities provide a more accurate risk assessment for investors and this, in turn, will give access to external financing at the possible lowest cost. As attractions of potential shareholders through the increased transparency of information, the company is likely to be in a more healthy and liquid position in stock markets. In other words, managers involved in earnings manipulations can be expected to make more corporate environmental disclosures in an attempt to pursue their own benefit.

Stakeholder-legitimacy theory

Stakeholder theory explains the relationship between stakeholders and the information they receive. Managers can be employed not only as the owner's agent but also as an agent of other stakeholders (Hill and Jones, 1992). Managers can take certain EM actions in an attempt to obtain personal gains at the expense of other stakeholders. Nonetheless, stakeholders will respond to management in case their own interests are damaged by EM practices. Thus, managers may have incentives to use their controls to make financial reports more informative and extensive, so as to minimise threats of being dismissed.

Ullman's (1985) seminal paper has pioneered legitimacy theory in relation to powerful stakeholders. There are two perspectives on corporate social responsibility activities: first, it builds a positive image among stakeholders and gains support and trust from diverse groups of stakeholders; secondly, it has a positive impact on corporate reputation and brings economic benefit from the strategic perspective. CSR activities are expected to improve relationships with shareholders, suppliers, creditors and other groups of stakeholders. In other words, the financial and economic performance of an entity has a positive connection with its social responsibility (Salama, 2005).

In line with Gray *et al.* (1995), information disclosed to the stakeholders might be regarded as a legitimate social contribution made by the organization. Managers engaged in earnings management tend to realise that voluntary environmental disclosures

can be used to maintain organisational legitimacy, especially with social and political stakeholders. CED initiatives provide a channel to inform stakeholders of the firm's wider interests and of its accountability to behave in a socially responsible manner. On the other hand, legitimacy management can be viewed as a way of communicating, within the organisation-society relationship, to obtain societal support. Managers, who have control of the decision making process, have incentives to use such strategies to fulfill the expectations of other groups of stakeholders. Hence, it is argued, the motivation for corporate social and environmental disclosures is to deflect stakeholders' attention from detection EM.

It seems that managers involved in EM are motivated to behave in a positive way to seek perceptions from shareholders and diverse groups of stakeholders that they are acting to assure optimal performance. Alternatively, organisations with a low level of EM are less likely to promote CED initiatives. Based on the above discussion, our main and first hypothesis is formulated as follows:

Hypothesis 1: Firms that engage in earnings management have incentives to undertake CSR initiatives such as corporate environmental disclosure (CED).

Prior research offers evidence that the reliability and the quality of accounting earnings is enhanced when managerial opportunistic behaviour is monitored by corporate governance mechanisms (Klein, 2002). Thereby, governance will be improved due to the reduction of agency conflicts. From an agency perspective, a larger board is an effective mechanism in monitoring managers. Jensen (1993) suggests that board size is negatively related to the ability of the board to pursue long term strategic goals. Nonetheless, increased board size leads to more experienced independent directors (Xie *et al.*, 2003), so it is likely to diminish managers' opportunistic manipulation such as earnings management by diverting attention to corporate social responsibilities.

Hypothesis 2: Board size is positively related to CSR activities.

Hypothesis 3: Board size will moderate the relationship between earnings management and corporate social responsibility; the greater the board size, the lesser the positive effect of earnings management on corporate social responsibility.

Ebrahim (2007) examines the relation between earnings management and the activity of both the board and the audit committee. Using a sample of US manufacturing companies for two years 1999 and 2000, he finds that earnings management, as measured by the modified Jones model, is negatively related to both board and audit committee independence and he documents that this relation is stronger when the audit committee is more active. Xie *et al.* (2003) also argue that an active audit committee is expected to have a large composition to effectively monitor discretionary current accruals.

Both studies used audit committee meeting frequency as a proxy for the level of audit committee activities, and indicate that the number of audit committee meetings is negatively associated with earnings management. Based on the above discussion, we formulate the fourth and fifth hypotheses as follows:

Hypothesis 4: Number of audit committee meetings is positively related to CSR activities.

Hypothesis 5: Number of audit committee meetings will moderate the relationship between earnings management and corporate social responsibility; the greater the number of audit committee meetings, the lesser is the positive effect of earnings management on corporate social responsibility.

4. Research method

Sample

The sample for this research is retrieved from the second review of environmental reporting in the annual reports and accounts of companies in the FTSE All-share Index for the year ending 31 March 2007. The FTSE All-share, as one of the FTSE UK indices, is designed to represent 98-99% of the UK equity market. The second report is published by the UK's Environment Agency Trucost. It examines corporate environmental disclosures on waste, water, climate change (and energy use), and the EU Emissions Trading Scheme in companies' annual reports and accounts. We exclude financial companies (i.e. insurance, banks, and investments funds) and utilities companies because of the unique characteristics of their financial statements. Financial data is collected for FTSE All-share non-financial companies from Thomson Database. This

database contains all the key financial items derived from company balance sheets, income statements and cash flow statements. Control variables such as the total number of board committee members and the number of audit committee meetings are manually collected from each company's annual report. Firms with missing data are removed from the analysis. This gives us a final sample of 245 firms for the year between 1 April 2006 and 31 March 2007.

Measurement of variables

Dependent variable- corporate environmental disclosure

Prior research has used many proxies for CSR. Content analysis is the most frequently used method to measure corporate social and environmental disclosures as a proxy for CSR. It is used to codify the content (or text) of writing into various categories on the basis of essential criteria.¹⁵ Disclosures are broadly classified into environmental, employee, community and customer disclosures.¹⁶ As illustrated in Prior *et al.* (2008), the scores are rated by SiRi ProTM, according to a firm's responsibility to different groups of stakeholders.

In our paper, CED will be adopted as a measure of CSR. The UK government has recently claimed that environmental reporting is a significant element of corporate reporting. Under the amendment of the Companies Act 2006, companies must now report on essential environmental issues within the Business Review or Operating and Financial Review (OFR) in their annual reports and accounts. Companies are required to employ the UK Government's *Environmental Key Performance Indicators (KPI) - Reporting Guidelines for UK Business*. Companies need to disclose quantitative environmental information for most of its recommended KPIs such as waste, water and energy use including climate change. The numbers relating to the core KPIs disclosed in accordance with Government Guidelines are as follows:

0: No Quantification;

1: General Quantification;

2: Data that could be derived to meet Government Guidelines;

¹⁵ See Webber, R. P. (1988) *Basic content analysis*, Sage University Paper Series on Quantitative Applications in the Social Sciences, Series No. 07-049, Sage, Beverly Hills, CA, and London.

¹⁶ CSEAR (The Centre for Social and Environmental Disclosure Database) is also based upon a content analysis of the social and environmental disclosures in the annual reports of the UK companies.

3: Disclosure that meets Government Guidelines.

Independent variable

Earnings management

Earnings management measured by discretionary accruals has been pioneered by Healy since 1985. Healy (1985: 89) explains that non-discretionary accruals are “the adjustments to the cash flows mandated by the accounting standard-setting bodies”, whereas discretionary accruals are “adjustments to cash flows selected by the manager”. Recent research on EM focuses on an analysis of discretionary accruals.¹⁷

The most widely used method to measure discretionary accruals in the literature are the Jones (1991) and the modified Jones (Dechow, Sloan, and Sweeney, 1995) models. However, Kothari, Leone, and Wasley (2005) argue that measuring discretionary accruals without controlling for firm performance will produce misspecification in the EM model, therefore they propose a model that includes an intercept and control for the firm performance using Return on Assets (ROA) to mitigate the problematic heteroskedasticity and mis-specified issues that exist in other aggregate accruals models. As many recent studies e.g. Changa, et al. (2010) and Cornett, et al.(2009). This study uses Kothari et al. (2005) performance adjusted discretionary accruals model with a two-digit SIC code to estimate the discretionary accruals.

Total accruals (TA_{it}) are measured by the difference between net income (NI_{it}) and net cash flows from operating activities (CFO_{it}) as follows: $TA_{it} = NI_{it} - CFO_{it}$. Discretionary accrual (DA_{it}), which is the proxy to detect EM, is the residuals of the following model:

$$TA_{it} / A_{it-1} = \alpha_i [1/A_{it-1}] + \beta_{1i} [(\Delta REV_{it} - \Delta REC_{it}) / A_{it-1}] + \beta_{2i} [PPE_{it} / A_{it-1}] + \beta_{3i} [ROA_{it} / A_{it-1}] + \varepsilon_{it}$$

Where:

¹⁷ See Jones (1991) model. He addresses that depreciation and change in working capital are the major components of the total accruals. Gross Property, plant and equipment (PPE) is used to measure the level of amortisation. Change in turnover is supposed to explain change in working capital net of short term depreciation.

TA_{it}	the total accruals of firm i in year t
ΔREV_{it}	the change in revenues of firm i between years t and t-1
ΔREC_{it}	the change in receivables of firm i between years t and t-1
PPE_{it}	the level of gross property, plant, and equipment of firm i in year t
ROA_{it}	Return on Assets of firm i in year t.
A_{it-1}	the total assets of firm i at the end of year t-1

Finally, since managers might have incentives to engage in either income-increasing or income-decreasing earnings management, we use unsigned (absolute value of) abnormal accruals as a proxy for the mixed effect of upward or downward earnings.¹⁸

In addition to applying Kothari et al. (2005) model of estimating discretionary accruals, this study also applies the same model using only the current accruals instead of long term accruals. Becker et al (1998) suggest that management have greater discretion over current accruals than long-term accruals.

Control variables

Corporate governance attributes are important as a signal to the shareholders of the level of EM behavior; and they also have impacts on the degree of earnings reliability (Dechow *et al.*, 1996). In our paper, we use board size as a measure of corporate governance to indicate the effect of EM on CSR. Shareholders have incentives to perceive large boards as having greater monitoring competence over managers' discretionary accounting choices.¹⁹ Klein *et al.* (2002) argue that the role of board audit committee is to monitor the firm's financial reporting process and to resolve conflicts between internal financial managers and outside auditors. Audit committee meeting frequency is used as a proxy for the level of audit committee activities, as in Xie *et al.* (2003).

Given that corporate governance is not the unique factor in influencing opportunistic

¹⁸ Other earnings management studies have used this measure; see Warfield *et al.* (1995), DeFond and Park (1997) and Bartov *et al.* (2000).

¹⁹ Relevant prior studies regarding board size: see Xie et al. (2003) and Dechow et al. (1996).

earnings manipulation, firm size, profitability, and financial leverage are incorporated as controls, since these variables may influence discretionary accruals, as indicated by previous studies (e.g. Xie *et al.*, 2003 and Press and Weintrop, 1990). We follow the specification shown in Prior *et al.* (2008), Chih *et al.* (2008) and Hackston and Milne (1996). Firm size is measured by total assets. Debt-to-equity ratio is used to measure a firm's leverage, as it is an indicator of the firm's financial structure. Profitability is measured using the accounting-based return on assets.

Method

Our main research hypothesis is that firms that engage in earnings management have more incentives to undertake corporate social responsibility (CSR) initiatives, such as corporate environmental disclosures (CED). In order to explain CED and investigate the expected positive relationship, we use the following Ordinary Least Square (OLS) regression with robust standard errors on a basis of cross-sectional analysis:

$$CED_{it} = \lambda_1 + \lambda_2(DA)_{it} + \lambda_3(Size)_{it} + \lambda_4(LEV)_{it} + \lambda_5(ROA)_{it} + \lambda_6(CG)_{it} + \lambda_7(AUDIT)_{it} + \lambda_8(INDUSTRY)_{it} + \varepsilon_{it} \quad [1]$$

Where:

Earnings management (DA)	Absolute performance adjusted discretionary accruals
Size (SIZE)	Total assets
Leverage (LEV)	Debt-to-equity ratio
Profitability (ROA)	Return on Total Assets
Corporate governance (CG)	Board size i.e. total number of board committee members
Audit (AUDIT)	Total number of audit committee meetings
Industry (INDUSTRY)	Indicator, 1 for regulated sectors, and 0 for unregulated sectors

Additionally, industry sector is considered as a dummy variable in an attempt to test whether it is effective in explaining the effect of earnings management on CED. As reported in Trucost's second review of environmental reporting in 2007, Industry Classification Benchmark (ICB), industry sectors are comprised of financials, industries, consumer services, consumer goods, oil & gas, health care, basic materials, technology, utilities, and telecommunications. As mentioned before, we exclude financial and utilities firms. Then, following Prior *et al.* (2008), we classify industry sectors into two

groups: regulated and unregulated sectors. Regulated sectors (i.e. oil & gas, health care, technology and telecommunications) are given a dummy value of 1; a value of 0 is given to the other sectors (the unregulated sectors). Robust regression for the regulated sectors is also conducted in the paper.

5. Results

Descriptive statistics

Table 1 represents descriptive statistics. Corporate environmental disclosure (CED) is calculated as number of core KPIs disclosed with respect to Government Guidelines. It shows that the minimum score is 0 out of 3, and the mean score is 0.278. Discretionary accrual as a proxy for earnings management has a mean value of around .06, which is comparable with the findings of prior studies such as .06 for Canadian companies and .03 for French companies, as reported by Othman and Zeghal (2006). The total number of board committee members has a mean value of 9 on a scale between 4 and 19 while the number of audit committee meetings ranges from is 2 to 14. Remarkably, the standard deviations of SIZE and LEVERAGE are the highest of the seven independent variables; hence they represent the widest dispersion of these values. Normality tests of these variables are provided in the following analysis.

Insert Table 1 here

Correlation analysis

Table 2 presents the correlation analysis. It shows that the variations in DA are positively correlated with variations in CED (1.77%). The positive relationship between firm size and corporate environmental disclosure is consistent with prior research. Large companies are expected to make more CED as a consequence of accountability and visibility to legitimise their business (Cormier and Gordon, 2001; Carven and Marston, 1999). It is notable that variations in board size are positively correlated with variations in both firm size and the number of audit committee meetings, suggesting that large firms have large boards. It also shows that, as the size of the board increases, the more active the audit committee becomes. ROA shows the highest correlation with DA at 40%, which enhances the argument that it is important to consider firm performance when measuring the discretionary accruals.

Insert Table 2 here

OLS regression with robust standard errors

Table 3A provides the OLS regression with robust standard errors, and corporate environmental disclosure (CED) is regarded as the dependent variable and earnings management (DA) and other control variables are considered as the independent variables.

CED is unrelated to DA (true for both long-term and current DA) since its p value in both models is about 0.67 with a robust standard error around 0.66²⁰. Similarly, financial leverage, return on assets and board size are also unrelated. The number of audit committee meetings is also unrelated to CED. However, firm size has a positive coefficient that is significant at the 0.01 level. This is consistent with the prior studies that reported that large companies are likely to face an increased pressure from external groups and they may undertake more CSR activities (e.g. corporate environmental disclosures) for the sake of external funds. We also find that industry sector, as a dummy variable, is negatively related to CED.

Insert Table 3A here

Managers may have motives to manage either income-increasing or income-decreasing earnings; hence in regression [1] following prior studies on EM, we comparably use absolute value of both long term and current discretionary accruals as a proxy of the issue of both upward and downward earnings management. As noted in Table 3A, the corporate environmental disclosure (CED) variable is also insignificantly associated with neither directions of positive nor negative absolute value of discretionary and current accruals, though it converts into a positive relationship with negative DA.

Number of audit committee meetings is related to CED in the signed discretionary accruals samples, audit committee meetings seems to positively impact the CED when managers imply upward EM practice while it has a negative effect on CED in firms with

²⁰ Robust standard errors exist if they are autocorrelated or heteroskedastic.

downward EM. This is in line with previous findings that suggest audit committees have different effect based on the type and directions of EM, which in turn may have reflected in the relationship between audit committee number of meetings and CED.

In the signed DA test, the firm size is not significant in the signed discretionary accruals models but remain significant in the current discretionary accruals models. This result raises the question of the possible effect of the type of EM strategy on the relationship between CED and firm size. The relationship between CED and industry type remain significantly negative in most of the tested models.

Insert Table 3B and 3C here

Following Myers and Omer (2003), we also tested the raw discretionary accruals. Panel (D) shows that raw long term discretionary accruals and raw current discretionary accruals have no significant effect on CED. In addition, neither board size, nor audit committee diligence is significantly associated with CED. However, firm size and industry type still show significant associations with CED in these models.

Insert Table 3D here

In order to test hypotheses three and five of the moderating role of corporate governance in the relationship between DA and CSR, we introduce two interaction variables of large boards with earnings management, and active audit committee with earnings management.

We employ the following cross-sectional regression model, which includes the interaction terms of corporate governance attributes and earnings management:

$$CED = b_0 + b_1 EM + b_2 EM*CG + b_3 EM*AUDIT + b_j \text{ Control Variables } j + e$$

Where:

EM = performance-matched discretionary accruals, measured in absolute, positive, and negative values

EM*CG is an interaction term between the DA variable and the BOARDSIZE dummy variable

EM*AUDIT is an interaction term between the DA variable and the AUDIT dummy variable

The results in Table 4 (Panel: A) show that the coefficient for board size is significantly negative at .10 level, whereas the coefficient for the interaction term EM*CG is positive (coef = .47 with $t = 2.9$, $p = \square .01$). In contrast, the coefficient for audit committee is significantly positive at .05 level, whereas for the interaction term EM*AUDIT is negative (coef = -0.39 with $t = -2.18$, $p = \square .05$).

Table 4 (Panel: A)

When the interaction effect between EM and corporate governance variables are included within the regression model, the effect of board size and audit committee becomes statistically significant, whereas the interaction effect is highly significant. These results also provide support for Hypothesis 2 concerning the negative moderating effect of audit committee in the relationship between earnings management practices and CED. Even though, this research has not documented a direct effect of the earnings management variable on CED, we provide evidence of the importance of considering the interaction and joint effect of earnings management and corporate governance variables on CED.

Furthermore, when we replace the absolute EM measure with signed EM measures (DA+ and DA-) in table 4 panel (B) to test the moderating role of corporate governance attributes in the relationship between signed DA and CSR, the findings are similar in the negative DA sample. However, in the positive DA sample, there is no significant interaction effect in both EM*CG and EM*AUDIT. This is may be due to the relatively small sample in this group or the weak effect of both board size and audit committee in effecting positive DA that is also found in the previous analysis.

Table 4 panel (B)

Robustness check

In the main test, the relationship between CED and DA is insignificant; this finding might be reflected when all the seven independent variables are included simultaneously. In order to check outliers of these variables, a normality test is conducted in Table (5). Considering the number of observations, the probability of Chi² being higher than 140.169 is 0.5% (see statistic table). Therefore, SIZE, LEVERAGE and AUDIT are found to be not normally distributed. A cross-sectional analysis using regression [2], is run after dropping these three variables from the initial model.

$$CED_{it} = \lambda_1 + \lambda_2(EM)_{it} + \lambda_3(ROA)_{it} + \lambda_4(CG)_{it} + \lambda_5(INDUSTRY)_{it} + \varepsilon_{it} \quad [2]$$

The results in table (5) are qualitatively similar to the main regression results of no significant relationship between DA and CED, however, there is a positive significant relationship between board size and CED.

Insert Table 5 here

Following Prior *et al.* (2008), we run robust regression for the regulated and unregulated industries sectors and find that the *p* value of ROA and leverage are significant at .01 and 0.05 levels respectively (see Table 6). Nevertheless, regulated industries sectors results indicate a positive and significant relationship between firm size and CED. Table (6) also shows that the relation between CED and EM is still insignificant in both regulated and unregulated industries sectors. These results indicate that the impact of firm size, leverage and ROA on CED are different based on industries sectors' characteristics, whereas CED and EM are not related regardless the sector type.

Insert Table 6 here

6. Conclusions

The aim of this article is to identify the association between corporate environmental disclosure (CED) and earnings management (EM) and the main hypothesis is that firms practising EM might have incentives to undertake CSR initiatives such as corporate environmental disclosure (CED).

We use the UK Government's Environmental Key Performance Indicators (KPI) for the

year ending 31 March 2007, as reported by Trucost, a respected environmental research company. Performance adjusted discretionary accruals model (Kothari. et al, 2005) is used to capture discretionary accruals as a measure of EM. We find insignificant association between CED and EM, when we run Ordinary Least Square (OLS) with robust errors. And this result is counterintuitive, even when some variables that are not normally distributed have been removed from the regression model.

In essence, managers are in a control of decision making processes, they are motivated to engage in either income-increasing or income-decreasing EM for their own benefit. Given that we comparably use absolute value of discretionary accruals, signed accruals and raw accruals for both long term accruals and current accruals as proxies for the mixed effect of earnings manipulation, and hence find insignificant relationship between CED and EM.

We also examined the interaction effect of corporate governance variables namely board size and audit committee diligence on the relationship between EM and CED. We find that audit committee diligence but not board size, effect the relationship between EM and CED. Thus, other corporate governance mechanisms (i.e. board composition and sub-committees characteristics) need to be considered in the future research as factors that may influence the relationship between EM and CED.

Robust regression is a confirmatory method in econometric models. More specifically, additional robustness check shows an insignificant association between CED and EM in regulated and unregulated industries. Despite that, firm size as a control variable is significantly positively related to CED. This is consistent with previous disclosure studies that report that large companies are likely to face an increased pressure from external groups and they may undertake more CSR activities for the sake of external funds. Another explanation for the association is that large companies are expected to make more corporate environmental disclosures (CED) as a consequence of accountability and visibility to legitimise their business (Cormier and Gordon, 2001; Carven and Marston, 1999).

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Variable	Mean	Median	Std.Dev	Max	Min
CED	0.278	0.000	0.727	3.000	0.000
DA	0.064	0.047	0.064	0.534	0.000
SIZE	3.581	0.618	13.628	126.598	0.034
LEVERAGE	92.317	44.620	248.876	3027.140	-679.370
ROA	7.147	7.770	10.673	38.580	-75.650
BOARDSIZE	9.420	9.000	2.685	19.000	4.000
AUDIT	3.698	4.000	1.289	14.000	2.000
INDUSTRY	0.216	0.000	0.413	1.000	0.000

Table 1: Descriptive Statistics

Table 2: Correlation Matrix

	CED	DA	SIZE	LEVERAGE	ROA	BOARDSIZE	AUDIT	INDUSTRY
CED	1							
DA	-0.043	1						
SIZE	0.1507	0.0265	1					
LEVERAGE	-0.0651	0.0526	-0.0225	1				
ROA	-0.0412	-0.4083	0.0047	0.0402	1			
BOARDSIZE	0.1121	-0.008	0.4865	0.1151	0.0319	1		
AUDIT	0.1378	-0.0085	0.4	0.0199	0.0637	0.3031	1	
INDUSTRY	-0.078	0.4046	0.1955	0.0992	-0.1642	0.1432	0.1233	1

Table 3: Regression estimates of CED on DA with robust standard errors

Panel (A): Absolute Value Measures												
Variable	Discretionary Long Term Accruals						Current Accruals					
CED	Coef.	Std. Err.	t	P>t	95% Conf.	Interval]	Coef.	Std. Err.	t	P>t	95% Conf.	Interval]
DA	-0.300	0.700	-0.430	0.669	-1.680	1.080	-0.295	0.666	-0.440	0.659	-1.607	1.017
SIZE	0.006	0.002	2.440	0.015	0.001	0.010	0.006	0.002	2.480	0.014	0.001	0.010
LEVERAGE	0.000	0.000	-1.010	0.312	0.000	0.000	0.000	0.000	-1.000	0.317	0.000	0.000
ROA	-0.005	0.004	-1.270	0.205	-0.013	0.003	-0.005	0.004	-1.260	0.208	-0.014	0.003
BOARDSIZE	0.015	0.016	0.910	0.362	-0.017	0.047	0.015	0.016	0.910	0.364	-0.017	0.047
AUDIT	0.055	0.048	1.160	0.245	-0.038	0.149	0.055	0.048	1.150	0.252	-0.039	0.149
INDUSTRY	-0.204	0.111	-1.840	0.067	-0.421	0.014	-0.210	0.103	-2.040	0.043	-0.412	-0.007
_cons	0.027	0.182	0.150	0.884	-0.332	0.385	0.029	0.185	0.160	0.875	-0.336	0.394
Number of obs	245						Number of obs	245				
F(7, 237)	4.590						F(7, 237)	4.600				
Prob > F	0.000						Prob > F	0.000				
R-squared	0.053						R-squared	0.053				
Root MSE	0.718						Root MSE	0.718				

Table 3: Regression estimates of CED on DA with robust standard errors

Panel (B): Signed Measures (Discretionary Long Term Accruals)

CED	Coef.	Std. Err.	t	P>t	95% Conf.	Interval]	CED	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
DA-	-0.212	0.616	-0.340	0.731	-1.429	1.004	DA+	2.176	3.152	0.690	0.493	-4.131	2.176
SIZE	0.004	0.003	1.600	0.112	-0.001	0.009	SIZE	0.033	0.030	1.110	0.273	-0.027	0.033
LEVERAGE	0.000	0.000	-0.650	0.514	0.000	0.000	LEVERAGE	-0.001	0.000	-2.110	0.039	-0.002	-0.001
ROA	-0.005	0.005	-0.920	0.357	-0.015	0.005	ROA	-0.019	0.010	-1.920	0.060	-0.038	-0.019
BOARDSIZE	0.009	0.018	0.480	0.634	-0.027	0.044	BOARDSIZE	0.043	0.051	0.840	0.405	-0.059	0.043
AUDIT	0.101	0.055	1.830	0.070	-0.008	0.211	AUDIT	-0.161	0.053	-3.040	0.004	-0.266	-0.161
INDUSTRY	-0.197	0.120	-1.650	0.101	-0.433	0.039	INDUSTRY	-0.588	0.203	-2.900	0.005	-0.994	-0.588
_cons	-0.091	0.222	-0.410	0.681	-0.529	0.346	_cons	0.521	0.446	1.170	0.247	-0.371	0.521
No of obs	178						No of obs	67					67
F(7, 237)	3.140						F(7, 237)	1.660					1.660
Prob > F	0.004						Prob > F	0.136					0.136
R-squared	0.076						R-squared	0.115					0.115
Root MSE	0.696						Root MSE	0.775					0.775

Table 3: Regression estimates of CED on DA with robust standard errors

Panel (C): Signed Measures (Current Accruals)													
CED	Coef.	Std. Err.	t	P>t	95% Conf.	Interval]	CED	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
DA-	-0.737	0.648	-1.140	0.257	-2.016	0.541	DA+	0.864	2.666	0.320	0.747	-4.461	6.189
SIZE	0.007	0.003	2.400	0.018	0.001	0.013	SIZE	0.009	0.004	2.570	0.012	0.002	0.017
LEVERAGE	0.000	0.000	-0.760	0.449	0.000	0.000	LEVERAGE	-0.001	0.000	-2.250	0.028	-0.001	0.000
ROA	-0.007	0.005	-1.480	0.142	-0.017	0.002	ROA	0.001	0.006	0.140	0.887	-0.012	0.014
BOARDSIZE	0.013	0.018	0.700	0.486	-0.024	0.049	BOARDSIZE	0.016	0.039	0.410	0.684	-0.062	0.093
AUDIT	0.110	0.073	1.500	0.136	-0.035	0.254	AUDIT	-0.030	0.046	-0.650	0.520	-0.121	0.062
INDUSTRY	-0.235	0.126	-1.870	0.064	-0.483	0.013	INDUSTRY	-0.185	0.180	-1.030	0.307	-0.544	0.174
_cons	-0.076	0.268	-0.290	0.776	-0.605	0.452	_cons	0.165	0.282	0.580	0.562	-0.399	0.728
No of obs	173						No of obs	72					
F(7, 237)	3.340						F(7, 237)	4.370					
Prob > F	0.002						Prob > F	0.001					
R-squared	0.067						R-squared	0.089					
Root MSE	0.761						Root MSE	0.613					

Table 3: Regression estimates of CED on DA with robust standard errors

Panel (D): Raw Measures												
Variable	Raw long Term Discretionary Accruals						Raw Current Accruals					
CED	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
DA	0.073	0.559	0.130	0.896	-1.028	1.174	-0.113	0.499	-0.230	0.821	-1.096	0.870
SIZE	0.006	0.002	2.440	0.015	0.001	0.010	0.006	0.002	2.420	0.016	0.001	0.010
LEVERAGE	0.000	0.000	-1.030	0.304	0.000	0.000	0.000	0.000	-1.060	0.290	0.000	0.000
ROA	-0.005	0.004	-1.160	0.249	-0.013	0.003	-0.004	0.004	-1.020	0.310	-0.013	0.004
BOARDSIZE	0.015	0.016	0.930	0.352	-0.017	0.048	0.015	0.016	0.930	0.355	-0.017	0.047
AUDIT	0.055	0.048	1.160	0.247	-0.038	0.149	0.056	0.048	1.180	0.238	-0.037	0.150
INDUSTRY	-0.214	0.111	-1.940	0.054	-0.432	0.004	-0.224	0.101	-2.220	0.027	-0.423	-0.025
_cons	0.007	0.181	0.040	0.969	-0.350	0.364	-0.003	0.184	-0.020	0.988	-0.365	0.359
Number of obs	245						Number of obs	245				
F(7, 237)	4.620						F(7, 237)	4.690				
Prob > F	0.000						Prob > F	0.000				
R-squared	0.052						R-squared	0.052				
Root MSE	0.719						Root MSE	0.719				

Table 4: Panel (A) Regression of the interaction effect of corporate governance attributes on the relationship of absolute DA and CSR

CED	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
DA (absolute)	-0.324	0.705	-0.460	0.646	-1.714	1.065
EMCG	0.294	0.122	2.410	0.017	0.054	0.535
EMAUD	-0.202	0.112	-1.800	0.074	-0.424	0.019
BOARDSIZE	-0.025	0.022	-1.150	0.253	-0.067	0.018
AUDIT	0.103	0.063	1.630	0.104	-0.021	0.228
SIZE	0.008	0.003	2.910	0.004	0.003	0.013
LEVERAGE	0.000	0.000	-0.900	0.367	0.000	0.000
ROA	-0.005	0.004	-1.150	0.252	-0.014	0.004
INDUSTRY	-0.238	0.106	-2.240	0.026	-0.447	-0.028
_cons	-0.324	0.705	-0.460	0.646	-1.714	1.065
Number of obs	245					
F(9, 163)	2.76					
Prob > F	0.0044					
R-squared	0.0788					
Root MSE	0.71147					

Table 4: Panel (B) The interaction effect of corporate governance attributes on the relationship of signed DA and CSR

CED	Coef.	Std. Err.	t	P>t	95% conf.	Interval	CED	Coef.	Std. Err.	t	P>t	95% conf.	Interval
DA -	-0.400	0.599	-0.670	0.505	-1.583	0.783	DA+	1.471	3.261	0.450	0.654	-5.048	7.990
EMCG	0.367	0.145	2.540	0.012	0.081	0.653	EMCG	-0.015	0.181	-0.080	0.934	-0.376	0.346
EMAUD	-0.247	0.134	-1.850	0.066	-0.512	0.017	EMAUD	-0.070	0.135	-0.520	0.605	-0.340	0.199
BOARDSIZ	-0.041	0.025	-1.630	0.105	-0.090	0.009	BOARDSIZ	0.015	0.046	0.320	0.752	-0.077	0.106
AUDIT	0.160	0.077	2.070	0.040	0.008	0.313	AUDIT	-0.012	0.053	-0.240	0.815	-0.118	0.093
SIZE	0.007	0.003	1.970	0.050	0.000	0.013	SIZE	0.009	0.004	2.450	0.017	0.002	0.017
LEVERAGE	0.000	0.000	-0.540	0.587	0.000	0.000	LEVERAGE	-0.001	0.000	-2.180	0.033	-0.001	0.000
ROA	-0.005	0.005	-0.960	0.339	-0.015	0.005	ROA	0.001	0.007	0.070	0.946	-0.014	0.015
INDUSTRY	-0.210	0.112	-1.880	0.062	-0.430	0.011	INDUSTRY	-0.206	0.186	-1.110	0.273	-0.577	0.166
_cons	-0.002	0.244	-0.010	0.995	-0.484	0.481	_cons	0.164	0.336	0.490	0.627	-0.507	0.835
No of obs	178						No of obs	72					
F(7, 237)	2.000						F(7, 237)	7.370					
Prob > F	0.042						Prob > F	0.000					
R-squared	0.120						R-squared	0.094					
Root MSE	0.683						Root MSE	0.622					

Table (5) Excluding outliers and non normally distributed variables.

CED	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
DA (absolute)	-0.387	0.737	-0.530	0.600	-1.839	1.065
BOARDSIZE	0.035	0.015	2.350	0.020	0.006	0.064
ROA	-0.005	0.004	-1.210	0.226	-0.013	0.003
INDUSTRY	-0.167	0.116	-1.440	0.150	-0.395	0.061
_cons	0.049	0.144	0.340	0.734	-0.235	0.334
Number of obs	245					
F(4, 240)	2.020					
Prob > F	0.092					
R-squared	0.026					
Root MSE	0.724					

Table (6): Robustness Regression of Different Sectors

Variable	Unregulated sectors						Regulated sectors					
	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]		
CED	0.098	1.417	0.070	0.945	-2.698 2.893	-0.062	0.309	-0.200	0.843	-0.684 0.561		
DA (absolute)	0.014	0.018	0.790	0.433	-0.022 0.051	0.006	0.002	2.870	0.006	0.002 0.010		
SIZE	0.014	0.018	0.790	0.433	-0.022 0.051	0.006	0.002	2.870	0.006	0.002 0.010		
LEVERAGE	-0.001	0.000	-2.040	0.043	-0.001 0.000	0.000	0.000	-0.040	0.972	0.000 0.000		
ROA	-0.019	0.006	-3.190	0.002	-0.031 -0.007	0.004	0.004	1.090	0.283	-0.003 0.011		
BOARDSIZE	0.018	0.020	0.890	0.376	-0.022 0.058	0.011	0.030	0.370	0.716	-0.050 0.072		
AUDIT	0.033	0.068	0.480	0.630	-0.101 0.166	0.061	0.065	0.940	0.352	-0.070 0.192		
_cons	0.199	0.271	0.730	0.464	-0.336 0.733	-0.245	0.217	-1.130	0.264	-0.682 0.191		
Number of obs	192					Number of obs	53					
F(7, 237)	2.320					F(7, 237)	7.310					
Prob > F	0.035					Prob > F	0.000					
R-squared	0.063					R-squared	0.253					
Root MSE	0.756					Root MSE	0.501					