Environmental and Social Disclosures: Link with Corporate Financial Performance

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Abstract:

Environmental and social disclosures entail costs, yet increasingly large listed firms are making higher and better quality disclosures. In this paper we examine the link between a firm's environmental and social disclosures and its profitability and market value. We find that past profitability drives current social disclosures. However, consistent with the existing evidence, we do not find any strong relation between environmental disclosures and profitability. Further, while prior literature has largely focussed on environmental disclosure and market performance, we find that it is the social disclosures that matter to investors. We find that firms that make higher social disclosures have higher market values. Further analysis reveals that this link is primarily driven by higher expected growth rates in the cash flows of such companies. Overall our findings are consistent with the resource based view of the firm and the voluntary disclosure theory suggesting that firms with higher economic resources make higher disclosures which yield net positive economic benefits.

Keywords:

Environmental disclosures; social disclosures; corporate social responsibility; corporate financial performance

1. Introduction

From an economics perspective, producing objective[1] environmental and social disclosures entail both real, proprietary and opportunity costs (Armitage & Marston, 2008; Brammer & Pavelin, 2006, 2008; Li & McConomy, 1999; Buhr, 2002; Verrecchia, 1983, 2001). Yet, environmental and social disclosures by large listed companies in the UK have grown phenomenally over the years, rising from approximately a page devoted to employee related disclosure in the 1970s (Gray, Kouhy, & Lavers, 1995, 62) to full-blown stand-alone sustainability reports issued by many listed companies in recent years. This trend is in accordance with the growing interest in environmental and social issues on the part of a variety of corporate stakeholders including socially responsible investors, employees, customers, regulators, government (Gray et al. 1995, Gray, Javad, Power, & Sinclair, 2001; Brammer & Pavelin, 2006, 2008; Clarkson, Li, Richardson & Vasvari, 2008, 2011; Deegan, 2004), as well as the wider society via various environmental and social activist groups (den Hond & de Bakker, 2007).

There is a general consensus in the literature that larger, more 'visible' firms are likely to make higher environmental and social disclosures (Gray et al., 1995, 2001; Hackston & Milne, 1996; Brammer & Pavelin, 2006, 2008; Guidry & Patten, 2012). However within this literature, the link between corporate operating performance (i.e. profitability) and such disclosures remains as yet unclear (see Freedman & Jaggi, 1988; Patten 1991; Gray et al. 2001; Brammer & Pavelin 2006, 2008; Clarkson et al., 2011; Guidry & Patten, 2012). Some scholars, drawing on the socio-political and

[1] By objective we mean 'hard' disclosures as used by Clarkson et al. (2008), which according to them, are quantifiable performance indicators which would be difficult for poor environmental performers to mimic.

legitimacy theory based arguments have posited and found some empirical support for the notion that such disclosures are driven primarily by public pressure and are aimed at gaining a 'license to operate' from the various corporate stakeholders and the wider society (Patten, 1991, 2002; Hackston & Milne, 1996; Walden & Schwartz, 1997). Others, drawing on the resource based view (RBV) of the firm (Hart, 1995; Russo & Fouts, 1997) as well as the economics based voluntary disclosure theory (VDT), (Verrecchia, 1983, 2001) have argued, that firms with superior environmental and economic performance would have the incentives to convey their 'type' by making higher and more objective environmental disclosures (Al-Tuwaijri, Christensen, & Hughes, 2004; Clarkson et al., 2008; 2011). Yet, studies taking this latter view have provided less than convincing evidence to support this view, especially with respect to measures of economic performance (see Guidry & Patten, 2012; Clarkson et al., 2011). In this paper we revisit the relationship between environmental disclosures and profitability; as well as explore the relatively understudied link between social disclosures and operating performance. In addition, we shed light on the direction of causality between such disclosures and profitability, an issue that prior research has identified as meriting attention (Gray et al., 1995, 2001; Brammer & Pavelin, 2006, 2008).

There is also an ongoing debate within the environmental and social disclosure literature as to whether these disclosures are value-relevant. Some scholars theorize and find empirical support for the notion that these are mainly a 'legitimation tool', (Gray et al., 1995; Cho & Patten, 2007); others drawing on the RBV and VDT theories have argued that these should matter to investors, as they convey value-relevant information about the firm's environmental performance (Al-Tuwaijri et al.,

2004; Clarkson et al., 2011). RBV theorists (Hart 1995; Russo & Fouts, 1997) argue that superior performance in the environmental arena can confer competitive advantages to the firm in the form of meeting and exceeding regulatory requirements, improving resource use efficiency and building a strong positive reputation. We argue that superior performance in the social arena as reflected by subsequent higher and more objective social disclosures can help build a firm's reputation and strengthen its relations with its key stakeholders like employees (Gray et al., 1995). Such disclosures therefore should matter to investors. Empirical evidence on environmental disclosures and the market performance of a firm, is however, at best, mixed (see Shane & Spicer, 1983; Steven, 1984; Freedman & Patten, 2004; Lorraine, Collison, & Power, 2004; Clarkson et al., 2011). In this paper we not only re-examine the link between environmental disclosures and the market value of a firm, but also examine the relatively understudied link between a firm's social disclosures and its share price.

Finally, we argue that firms may accrue competitive advantages through higher disclosures (Armitage & Marston, 2008), arising possibly from lower operating costs (due to higher resource use efficiency); higher employee productivity; lower transaction costs (like employee turnover); lower distributional conflicts (like equal work and pay opportunities) with its key stakeholders like employees; and a reputation for openness, transparency etc. We hypothesise that this competitive advantage will most likely be manifested through higher growth rates of expected cash flows of such firms. Accordingly, we test whether expected growth rates of the firms' cash flows are impacted by environmental and social disclosures.

Our analyses reveals some interesting results. First consistent with the RBV and VDT theory based arguments, we find that more profitable firms with financial slack make higher combined environmental and social disclosures, particularly social disclosures. Consistent with prior literature we find the link with environmental disclosures to be at best weak. Our finding of a positive link between social disclosures with lagged operating performance implies that profitable companies with resource slack tend to invest more in their employees, for example in their training and/or their health and safety – practices which they subsequently disclose. This finding extends Gray et al.'s (1995) earlier findings that companies in UK have over the years started to focus more on employees, making higher disclosures related to employee training, health and safety and issues of diversity and equal opportunities.

In terms of the value relevance of disclosures, we find a clear positive link between social disclosures and the firm's share price. However, consistent with prior literature, we find no link between environmental disclosures and firm share prices. This evidence complements our profitability related findings, and suggests that social disclosures matter to investors. Our finding of the impact on share price coming through higher implied growth rates in expected cash flows further suggests that social disclosures creates competitive advantages that are commercially beneficial and value relevant.

The rest of the paper is organised as follows. Section 2 discusses the relevant literature and presents the three main hypotheses that we test. Section 3 discusses the data, variables and the econometric models. Section 4 presents the results. Section 5 details the robustness check and section 6 concludes.

2. Literature review and development of hypothesis

2.1 *E and S disclosures and firm operating profitability*

The extant literature has examined the firm and industry specific characteristics that are associated mainly with environmental disclosures. There is a general consensus within this literature that larger, more publicly visible firms and those from more polluting industries are likely to make higher disclosures (Gray et al. 1995, 2001; Brammer & Pavelin, 2006; 2008). Debate however continues as to whether poor environmental performers make higher environmental disclosures or whether superior environmental and economic (operating) performance is associated with superior environmental disclosures. Legitimacy theorists argue that environmental and social disclosures are driven by public pressure, and are aimed at gaining social legitimacy for a firm's operations that create significant environmental and social impacts (see Gray et al., 1995; Hackston & Milne, 1996; Walden & Schwartz, 1997; Patten, 1991, 2002a, 2002b; Cho & Patten, 2007). This view is articulated well by Patten (1991) who argues that '….*social disclosure is a means of addressing the exposure companies face with regard to the social environment.* And that *'the social legitimacy of business is monitored through the public-policy arena rather than the marketplace and, as such, the extent of social disclosure should be more closely related to the public pressure variables than the profitability measures.'* (Patten, 1991, 297-298). In his study of the factors driving the social disclosures of 156 Fortune 500 companies, Patten (1991) finds support for these arguments. He finds size and industry classifications (which cover the most polluting industries) to be the main factors associated with social disclosures. None of his profitability measures have a significant association with social disclosures. His subsequent studies

including Patten (2002a, 2002b) as well as Cho and Patten (2007) are also consistent with his previous findings and suggest that in addition to size and industry, poor environmental performance appears to drive higher environmental disclosures. However following the 1991 study, none of Patten's later studies focus on social disclosures, nor do they include any measures of profitability as determinants of disclosure (See Patten, 2002a, 2002b; Cho & Patten, 2007).

In contrast to the legitimacy perspective, other scholars have (either implicitly or explicitly) drawn on the resource based view of the firm i.e. the RBV theory (Hart, 1995; Russo & Fouts, 1997); and the economics based voluntary disclosure theory (Verrachia, 1983, 2001). They have argued and found empirical support for the notion that superior environmental performers also possessing superior economic resources are likely to make higher and better quality i.e. more objective environmental disclosures (see Al-Tuwaijri et al. 2004; Clarkson et al., 2008, 2011). While these scholars have found a positive link between superior environmental performance and environmental disclosures, the link of the latter with economic resources that is operating profitability is however, either not explicitly tested (e.g. Al-Tuwaijri et al., 2004) or is found not to be significant (Clarkson et al., 2008, 2011). Moreover, these studies do not test the relationship of profitability with any measures of social disclosures.

Despite the lack of any substantive evidence in the prior literature on (predominantly) environmental disclosures and firm operating performance, one can argue a number of reasons as to why one should find a positive link between higher and more objective environmental and social disclosures and firm profitability. First, making 'hard' or quantified, objective environmental (and social) disclosures entail significant

real costs of production as they involve putting in place systems for identifying, measuring and reporting such information (see Li and McConomy, 1999; Buhr, 2002, Larsen, 2000; Brammer & Pavelin, 2008), costs which according to the RBV theory, more profitable firms would be better able to incur. Second, according to the VDT theory, by revealing objective information about a firm's environmental and social processes, practices and performance, firms incur significant proprietary costs (as revealing information about a firm's environmental technologies, environmental and social practices and performance can be commercially sensitive, not only from the competitors but also the social and environmental activists point of view) which more profitable firms would be more willing to incur in order to convey their 'type' (i.e. better environmental and social performers). Finally, by making hard disclosures, firms incur opportunity costs of lowered future strategic discretion that making public commitments to verifiable current and future actions entail (Brammer & Pavelin, 2008, 122). Thus it is reasonable to expect that firms with higher profitability and resource slack would make higher and more objective environmental and social disclosures. Accordingly, we hypothesise that (stated in alternative form):

H1: Firms with higher operating profitability will have higher environmental and social disclosure scores.

It is important to note that in the above hypothesis, we assume the causality to run from profitability to environmental and social disclosures. Given the cross sectional nature of prior studies (e.g., Freedman & Jaggi, 1988; Patten, 1991; Brammer & Pavelin, 2006, 2008), to date it has only been possible to establish correlation, but not causation. In our study, drawing upon Nelling and Webb's (2009) application of

Granger causality, we also explicitly test for causality between our sample firms' profitability and their environmental and social disclosures.

Environmental and social disclosures and firm value

Superior environmental and socially responsible (ESR) practices and their subsequent disclosure can be a significant source of competitive advantage for a firm (Hart, 1995; Russo & Fouts, 1997; Armitage & Marston, 2008). With increasing societal and regulatory pressure for monitoring responsible business practices (for example, through introduction of Stewardship Code in the UK for institutional investors), investors are also now becoming more interested in the environmental and social practices of their investee companies. Hence firms which produce higher and more objective environmental and social disclosures are likely to be viewed more favourably by investors in terms of their long run competitiveness, sustainability and profitability prospects. Accordingly, higher and better disclosure of these practices can lead to higher share prices for such companies. Thus, consistent with the predictions of the VDT theory (Verrecchia, 1983, 2001), one can argue that despite the associated proprietary costs (as discussed in previous section), firms would make higher and more objective environmental and social disclosures, in order to benefit from higher share prices. Empirically however, many prior studies find a negative link between a firm's mainly environmental disclosures and its share price performance (for example, Shane & Spicer, 1983; Stevens 1984; Freedman & Patten, 2004; and Lorraine et. al., 2004). It is important to note though that these studies gauge the stock market reaction to mostly negative environmental information which as Aerts, Cormier and Magnan (2008) point out could be responsible for the negative stock market impact documented. Shane and Spicer

(1983) for example study the stock market reaction to the negative environmental publicity received by firms which feature in the Council of Economic Priorities (CEP) reports in the US, while Lorraine et al. (2004) focus on the market reaction to publicity about environmental fines and environmental awards for a sample of 32 such events. More recent work (Clarkson et al., 2011) using a comprehensive and more objective measure of environmental disclosure, however, finds a positive link between such disclosures and the economic value (i.e. market value) of a firm.

At this point it is worth noting that while environmental disclosures have been frequently studied, social disclosures have received relatively scant attention in this literature. One notable exception is the work by Cormier, Aerts, Ledoux and Magnan (2009) who study the impact of the precision attribute of social and human capital disclosures on stock market information asymmetry as measured by the market value of a firm. These scholars argue that because social and human capital are key drivers of firm value. Objective and more precise voluntary disclosures in these areas are likely to be valued by investors. Using a sample of 131 large Canadian firms, they find a positive link between the information precision of social disclosures and firm market value. Consistent with Cormier et al.'s (2009) findings, we argue that social disclosures are likely to be value relevant for a number of reasons. First, a strong reputation in the social arena as reflected by higher and more objective social disclosures can help a firm attract and retain quality employees (Cormier, Ledoux & Magnan, 2011); enhance employee morale and hence productivity (Siegel, 2009); and by building good will and trust with its key stakeholders help reduce the transaction costs (e.g. lower employee turnover) and distributional conflicts (e.g. by promoting diversity, equality of pay, fair trade terms etc) with a firm's key

stakeholders (Heal, 2005). All of these outcomes should have positive implications for a firm's market value as measured by its share price. Based on the preceding arguments, we hypothesise (in alternative form):

H2: Firms with higher environmental and social disclosure scores have higher market values.

Environmental and social disclosures and firm's expected cash flows

The preceding discussion suggests that effective ESR (and its subsequent disclosure) can enhance a firm's share price as it would bring real economic benefits to the firm. These, as we have discussed could include enhanced resource use efficiency, higher employee productivity as well as lower transaction costs with key stakeholders like employees etc. The impact of these benefits is most likely to manifest in the form of higher expected cash flows of such firms. To this effect, scholars (Godfrey, Merrill & Hansen, 2009; Cooper, 2006) argue that building good will with key stakeholders through effective ESR (and its disclosure) can bring significant benefits in the form of reduced cash flow shock when a negative event occurs. Moreover in the context of ESR, scholars have also argued that firms which merge their environmental and social objectives with their financial objectives build confidence and enjoy stronger reputation among key stakeholders that can safeguard against activist actions, as well as open doors to new communities and additional sales (Kim & Nofsinger, 2007). Finally, increased environmental and social disclosures may also lower the costs of monitoring the firm and therefore may have a positive impact on the cash flows that shareholder receive (Stulz, 1999). Based on such arguments, we hypothesise that the affect on market value of higher

environmental and social disclosures is likely to manifest through higher expected growth rates in cash flows (Clarkson, Guedes, & Thompson, 1996). Accordingly we hypothesise (stated in the alternative form):

H3: Firms with higher environment and social disclosures will have higher expected growth rate in cash flows (residual incomes).

3. Sample, variables and models

3.1 Sample

The sample for this study consists of FTSE350 index companies covering the years 2005-2009. We exclude financial companies[2] as these firms follow a different set of environmental and social regulations like the 'Equator Principles'[3] (Macve and Chen, 2010). This reduces our sample by about a 100 firms each year. Further, based on the availability of environmental and social disclosure scores, we are left with a final sample consisting of 152, 214, 165, 87 and 11 firms for the years 2009, 2008, 2007, 2006 and 2005 respectively. In total, these make up 629 firm-year observations. It is worth noting though, that where we use analysts forecasts and research and development (R&D) data in our analyses we lose some observations due to non-availability of this data for some firms. We classify industries based on FTSE/DJ single-digit Industry Classification Benchmark (ICB) March 2008 version. This leads

[2] We have analysed a sustainability reports of some financial companies such as HSBC and Barclays, and found their disclosure formats and contents are dramatically different from other non-financial companies. Thus, financial companies are excluded for this study.

[3] Equator Principles is a risk management framework, adopted by financial institutions for determining, assessing and managing environmental and social risk in projects. See http://www.equator-principles.com/

to 9 single-digit industry classifications in our sample: Oil & Gas, Basic Materials, Industrials, Consumer Goods, Health Care, Consumer Services, Telecommunications, Utilities and Technology.

3.2 Variables

Table 1 describes in detail the variable names, their measurement and data sources. The data on all the financial variables is obtained from Datastream. Environmental news data used for constructing the media coverage variable is obtained from Nexis@UK. From Thomson Reuters Institutional Brokers' Estimate System (IBES), we obtain the consensus (mean) analysts forecasts of earnings and dividends and the analyst coverage data.

[Insert Table 1 about here]

The primary variables of interest in this study are the environmental and social disclosure scores of companies developed by Bloomberg. Bloomberg assigns environmental and social disclosure scores to companies based on data points collected via multiple sources including annual reports, standalone sustainability reports and company websites. 86 different data points (60 environmental and 26 social related) are collected, capturing standardized cross-sector and industry-specific metrics. Moreover, within each environmental and social category, the individual company score is expressed as a percentage, so as to make the score comparable across companies. The score is also tailored to be industry relevant, so that each company is evaluated only in terms of the data that is relevant to its industry sector. The data points are also weighted in terms of importance within each category, so that Green House Gas emissions for example would be weighted more

heavily than other data points within the environment category. Hence, the scores not only capture the quantity but the quality of environmental and social disclosures. A short description of data points covered in each score is discussed below. The complete list of the data points collected under the E and S categories is given in Appendix 1.

The ‘E’ score covers various types of environmental information that could broadly be classified as ‘hard’ items and ‘soft’ items. ‘Hard’ items include quantifiable data like Carbon/GHG emissions, energy/water consumption, waste recycled, investments in sustainability, and ISO certification, among others. ‘Soft’ items include firms’ environmental policies and initiatives such as waste reduction policy, energy efficiency policy and green building policy, among others. As can be seen in Appendix 1, approximately 80% of environmental disclosure items covered are ‘hard’ objective data items, while only 20% (12 out of 60) are ‘soft’ data points. Thus, these environmental scores largely captures a firm’s ‘hard’ environmental disclosure. This is important as poor environmental performers would find difficult these harder to mimic (Clarkson et al. 2008).Also, Cormier et al. (2009) finds these ‘hard’ disclosures to be more strongly associated with reducing the information asymmetry between the firm and its investors.

The ‘S’ score developed by Bloomberg mostly covers reporting of issues related to employee relations, such as employee health and welfare, as well as their training and development including training in CSR. The ‘S’ score also covers disclosure of issues of equality and diversity in employment, community spending and human rights. Based on the type of information covered, about 70% of social score is based on ‘hard’ items while ‘soft’ information makes up about 27% of the score (i.e. 7 out of

26 data points). Hence, the 'S' score, is also likely to be more reflective of a firm's actual social performance. In our analysis, we use the environmental scores, the social disclosure score and a combined environmental and disclosure score that is the sum of the environmental and social scores which can be interpreted as the aggregate environmental and social disclosure score.

3.3 Models

In the following section we describe the specific models used in our analyses. For the profitability analysis (H1), we develop three regression equations. Equation (1) models the association between environmental and social disclosure scores and firm profitability (H1). Equations (2) and (3) are a test for causality between firms' operating profitability and their E/S/ES scores. In each model we control for a number of variables used in the related literature. Below we discuss each model in detail.

$$\text{Disclosure Score}_{it} = \beta_0 + \beta_1 \text{Profitability}_{it} + \beta_2 \text{Slack}_{it} + \beta_3 \text{Size}_{it} + \beta_4 \text{Leverage}_{it} + \beta_5 \text{Financial Activities}_{it} + \beta_6 \text{Strategic Holdings}_{it} + \beta_7 \text{Media Exposure}_{it} + \sum_{j=1}^{j=10} \beta_{8j} \text{IND}_{jit} + \sum_{j=2005}^{j=2009} \beta_{9j} \text{year}_{jit} + \varepsilon_{it} \quad (1)$$

In Equation (1), disclosure score (environment/social/combined environmental and social) is the dependent variable. The main explanatory variable is profitability which is measured by return on sales (ROS). The choice of this measure is driven both by empirical use in prior related literature (Callan & Thomas, 2009), as well as by theoretical arguments that the provision of voluntary E and S disclosures (being a form of a public good) should strategically be tied to the sales of a company (Siegel, 2009, 8). Following prior literature, we control for: firm size (Patten, 1991; Brammer

& Pavelin, 2006, 2008; Dhaliwal, Li, Tsang, & Yang., 2011;); leverage (Brammer & Pavelin, 2006, 2008; Cormier et al., 2011); financial activities (Dhaliwal et al., 2011); media exposure (Brammer & Pavelin, 2006); strategic holdings (Brammer & Pavelin, 2006); slack (Arora & Dharwadkar, 2011); industry (Patten, 1991); and year dummies. To test for causality between a firm's operating profitability and its ES/E/S score, we carry out a Granger causality test following Nelling and Webb (2009). The models tested are as follows:

$$\text{Disclosure Score}_{it} = \beta_0 + \beta_1 \text{Disclosure Score}_{it-1} + \beta_2 \text{Profitability}_{it} + \beta_3 \text{Profitability}_{it-1} + \beta_4 \text{Slack}_{it} + \beta_5 \text{Size}_{it} + \beta_6 \text{Leverage}_{it} + \beta_7 \text{Financial Activities}_{it} + \beta_8 \text{Strategic Holdings}_{it} + \beta_9 \text{Media Exposure}_{it} + \sum_{j=1}^{j=10} \beta_{10j} \text{IND}_{jit} + \sum_{j=2005}^{j=2009} \beta_{11j} \text{year}_{jit} + \varepsilon_{it} \quad (2)$$

$$\text{Profitability}_{it} = \beta_0 + \beta_1 \text{Profitability}_{it-1} + \beta_2 \text{Disclosure Score}_{it} + \beta_3 \text{Disclosure Score}_{it-1} + \beta_4 \text{Slack}_{it} + \beta_5 \text{Size}_{it} \beta_6 \text{Leverage}_{it} + \beta_7 \text{Financial Activities}_{it} + \beta_8 \text{Strategic Holdings}_{it} + \beta_9 \text{Media Exposure}_{it} + \sum_{j=1}^{j=10} \beta_{10j} \text{IND}_{jit} + \sum_{j=2005}^{j=2009} \beta_{11j} \text{year}_{jit} + \varepsilon_{it} \quad (3)$$

In Equation (2), disclosure score (environment/social/combined environmental and social) is a function of lagged disclosure score, current profitability and lagged profitability, while in Equation (3), profitability is a function of lagged profitability, and current and lagged disclosure score. All other variables are the same as in Equation (1). If the coefficients β_2 and β_3 of profitability are significant in Equation (2), we conclude that firms' profitability 'Granger causes' disclosure. Similarly, if the coefficients β_2 and β_3 in Equation (3) are significant, then we conclude that firms' disclosure score 'Granger causes' profitability.

To test the impact of environmental and social disclosures on firm value (H2), we adapt a model developed in the value relevance literature and implemented in Barth, Clement, Foster, and Kasznik (1998). The specific form of the model is:

$$P_{it}= \beta_0 + \beta_1 BVPS_{it}+\beta_2 EPS_{it}+\beta_3 \text{Disclosure Score}_{it}+\beta_4 ROA_{it}+ \beta_5 RDPS_{it}+\beta_6 SIZE_{it}+\beta_7 Leverage_{it} \sum_{j=1}^{j=10} \beta_{8j} IND_{jit}+ \varepsilon_{it} \quad (4)$$

Where P_{it} is the market price of the firm's share at time t. BVPS is the book value per share, EPS is earnings per share and disclosure score*it* is either the environment/social/combined environmental and social score for firm *i* in year *t*. In (4) we also include a proxy for size, profitability and leverage as control variables. We control for the effect of intangibles on firm value by including the R&D expenditure per share as a control variable. To test (H3), we use a model based on Lee, Myers and Swaminathan (1999) as in (5) below:

$$p_t = b_t + \sum_{\tau=1}^{n} \frac{(FROE_{t+\tau} - r_e)}{(1+r_e)} b_{t+\tau-1} + \frac{(FROE_n - r_e) b_{n-1}(1+g)}{(r_e - g)(1+r_e)^n} \quad (5)$$

In (5) g is the long run growth rate of `residual incomes' from year n onwards, $FROE_{t+\tau}$ is the forecasted return on equity for period t + τ, computed as forecast $\frac{EPS_{t+\tau}}{BVPS_{t+\tau-1}}$, where $EPS_{t+\tau}$ is the forecasted EPS and $BVPS_{t+\tau-1}$ is the book value of equity per share for period $t + \tau - 1$. Since analyst forecasts for UK firms is most complete for forecast periods up to two years ahead, in our implementation of (5) we restrict n to 2. To estimate the cost of equity capital, r_e, required in (5) we follow Gregory, Tharyan and Whittaker (2013). First, Gregory et al. (2013) show that differences in cost of capital differences between firms is driven mainly by industry effects and therefore we use the industry cost of capital as a proxy for the firm cost of capital. To arrive at the industry cost of capital, we first calculate industry betas

each month using the previous 60 months of returns, by regressing industry returns on market returns. Then, we use these estimated rolling betas in a simple capital asset pricing model (CAPM) framework to arrive at a time varying cost of capital each month. Specifically, the industry cost of capital is calculated as r_f + (industry beta x the market risk premium). Where, r_f is the 3 month UK treasury bill rate and the market risk premium is assumed to be 4.3% and is based on estimates from Dimson (2011).[4] For each industry, these monthly measures are averaged over each year to arrive at a cost of capital measure for that year. Having estimated r_e, the specification in (5) allows us to solve for the long run growth rate, g, that is implied by the share price, p_t by using: analysts' earnings forecasts; the forecasted value of b_t (i.e. book value at t) estimated using the clean surplus relation and the estimated cost of equity capital, r_e. Once we estimate the growth rates, we analyse the impact of environment/social/combined environmental and social score disclosures on the long run implied growth rates by a regression of the growth rate 'g' on disclosure i.e. E/S/ES scores and control variables including profitability (ROA), a proxy for firm size (Weir, Lang & McKnight., 2002; Lo and Sheu, 2007), leverage (Weir et al., 2002), R&D expenditure, and indicator variable for industry membership. The specific model is as follows:

$$g_{it}=\beta_0+\beta_1 \text{Disclosure Score}_{it}+\beta_2 RDPS_{it}+\beta_3 ROA_{it}+\beta_4 SIZE_{it}+\beta_5 Leverage_{it}+\sum_{j=1}^{j=10}\beta_{6j} IND_{jit}+\varepsilon_{it} \quad (6)$$

where g_{it} (grate) is the long run implied growth rate of residual incomes.

[4] As in Gregory et al. (2013), we undertake a sensitivity analysis by assuming a range of values (3%-5%) consistent with the Dimson (2011) estimates and our results are robust

4. Results

Table 2 shows that the mean value of the combined environmental and social score is 53%. For the individual scores, social disclosure has an average score of 32%, and environmental disclosure of 21%. The mean values of lagged environmental and lagged social are 21% and 32% respectively. The average slack (which is the natural log of the sum of cash & short term investments and accounts receivables) is 6, equivalent to the mean value of £403 million. Average ROS is 12%, while the mean value of lagged ROS is 14%. Average size measured as natural log of employee number is 9.32 (i.e. about 11,159 employees) and natural logarithm of net sales is 14.39 i.e. approximately £8 billion. The average leverage i.e. total debt to total assets ratio is 25%. The mean values of strategic shareholdings (i.e. shareholdings of 5% or more, Datastream classification) and financial activities (new equity raised as % of total assets) are 19% and 2% respectively. The mean of the log of media exposure is 1.5. In other words, the average number of environmental news to which a firm is exposed in one year is about 5. On average, there are 13 analysts issuing earnings forecasts for a firm in a year. The average book value per share (BVPS), earnings per share (EPS) and R&D expenditure per share (RDPS) are £5.26, £0.39 and £0.04 respectively.

[Insert Tables 2 and 3 about here]

As can be seen in Table 3, there is a high correlation among disclosure scores and their lagged values, which implies stickiness of these scores across years. It seems that once a firm sets a precedence of voluntary reporting in a particular area, it tends to continue doing so in subsequent periods, consistent with the costs of commitment argument. When size is measured as log sales, there is a relatively high correlation

between firm size and slack (0.86); and firm size and media exposure (0.62), suggesting that bigger and more publicly visible firms have greater financial slack. As expected we find a high correlation (0.49) of book value per share with market price per share, and (0.81) of earnings per share with market price, suggesting that both are highly value relevant. We now turn to the results of the tests of our hypotheses.

[Insert Table 4 about here]

As Table 4 shows, when environmental score is the dependent variable, the coefficient on ROS is both positive and significant ($p<0.05$). This result suggests that firms with higher current operating profits have the resources to invest in the mitigation of the environmental impacts of their operations (e.g. through better recycling of resources, improved pollution abatement etc.) which they then report via higher environmental disclosures. We however, do not find any significant relation between operating profitability and social score. Overall, these findings support our hypothesis (H1), and are consistent with the RBV and VDT based view, that more profitable firms are likely to have the resources to make superior contemporaneous investments in the environmental arena which they then convey to investors and other stakeholders via higher environmental disclosures., These results are also consistent with the costs argument as more profitable firms are likely to be better able to afford making higher and more objective environmental disclosures. Moreover, our findings of a positive link of both environmental and social disclosures with financial slack, suggests that such firms can also bear the opportunity costs of commitment implied by such disclosures. Managers in firms with higher resource slack are likely to have greater access to resources which would allow them to honour their environmental and social commitments – thus lowering their opportunity

costs of making such disclosures. Consistent with prior findings (Brammer & Pavelin 2006, 2008), we also find a positive relation of environmental and social disclosure scores with both size and media exposure in all regressions. These findings suggest that larger firms with greater public exposure tend to provide more environmental and social information. Also consistent with prior findings (Brammer & Pavelin, 2006, 2008), we find a negative relation between strategic shareholdings and ES and E disclosures, with a significant negative relation for environmental and the combined environmental and social disclosures. This result suggests that firms having more concentrated shareholdings (and therefore by implication) a lower information asymmetry between the firm and its investors tend to disclose less environmental and social and environmental information. Firms with concentrated shareholdings maybe less stakeholder-oriented and prefer to invest less in ESR related activities, thus have less to report in these areas. Prima facie these findings are largely consistent with prior UK evidence on determinants of environmental disclosures (Gray et al., 2001; Brammer & Pavelin, 2006, 2008). However as we note in our hypotheses development section, causality is an issue that previous research has identified as meriting attention before one can draw any strong conclusions about the strength and direction of the relationships identified. We turn to this next.

[Insert Table 5 here]

Table 5 reports the results of Granger causality test with respect to disclosure score and firm profitability. While we do not find any evidence of causality running from disclosures to profitability, we find evidence of causality with respect to lagged profitability and environmental and social and particularly social disclosures. This finding suggests that firms that have a track record of being profitable, have the

resources and willingness to commit to investments in the social arena. Contrary to say pollution abatement expenditures, investments in stakeholders like employees entail longer term commitments (for example decisions to improve pay conditions or health and safety conditions cannot be reversed easily), the type that firms would be willing to enter into only if they have a track record of profitability – hence the link of lagged profitability with social disclosures. This finding is also consistent with prior related evidence in the literature that over the years, companies at least in the UK have enhanced their stakeholder engagement especially with respect to their employees (Gray et al. 1995).

In terms of the control variables, we find that after controlling for lagged values of the dependent variable other than size, all controls discussed earlier lose their explanatory power. This finding leads one to question the cross sectional findings of previous research and highlights the importance of controlling for lagged values of disclosure (consistent with the costs of commitment argument). Nevertheless our finding that the lagged value of profitability matters for social disclosures despite additional controls can be seen as a relatively strong finding. We now turn to the issue of value relevance of environmental disclosures (H2). Table 6 presents the regression results of testing hypothesis (H2).

[Insert Table 6 here]

Consistent with our hypothesis (H2), we find a positive and significant association between the overall ES disclosure and the firm's stock price. At a disaggregated level, similar results are generated for social disclosure, though not for E disclosures. In some ways, this finding is quite surprising, given the preponderance in literature on capital market implications of environmental performance and environmental

disclosures. Our findings suggest that while the academia has focused more on environmental issues in ESR research, for investors it is the social performance and its subsequent disclosure that appears to matter more. It seems that investors place a relatively higher value on firms who are seen to better address their social responsibilities towards their stakeholders particularly their employees (given that the Bloomberg social disclosure score covers largely issues related to employees). While theoretical arguments for ESR also focus on employees (Seigel, 2009; Heal 2005) anecdotal evidence also suggests that prominent distributional conflicts between business and its stakeholders have been related to employee issues; well-known examples being Wal-Mart and Nike (see Heal 2005 for further details). It appears that investors have now become sensitised to how a business addresses its responsibility towards this key stakeholder, placing higher value on firms which are seen to be more concerned about their relations with this key stakeholder.

[Insert Table 7 here]

Table 7 tests the third hypothesis (H3). Results in Table 7 show that, consistent with the positive impact on firm value of S disclosure, the long run implied growth rates in residual income are positively and significantly associated with social and the combined environmental and social disclosures, but not with environmental disclosures. This result further strengthens our earlier assertion that social disclosures matter to investors primarily because they help build a firm's social and moral reputation, leading to increased ability of the firm to attract and retain better more productive employees; and help reduce transaction costs; and distributional conflicts with this and other key

stakeholders. All these are factors that would have a positive implication for the firm's future cash flows.

5. Robustness checks

In the analysis of the impact of disclosure on firm value, it is possible that this effect is manifested via the discount rate or the cost of equity capital. Although, we do not have a formal hypothesis, regarding the cost of capital effects, however given its importance in the disclosure literature (Botosan, 2006; Verrecchia, 2001, Dhaliwal et al. 2011) we run regressions similar to the regression in (4), but with the implied cost of capital estimates as the dependent variable. The specific form of the regression we run is:

$$re_{it}=\beta_0+\beta_1 \text{Disclosure}_{it}+\beta_2 RDPS_{it}+\beta_3 ROA_{it}+\beta_4 SIZE_{it}+\beta_5 Leverage_{it}+\sum_{j=1}^{j=10}\beta_{6j} IND_{jit}+\varepsilon_{it} \quad (7)$$

Where, re_{it} is the cost of equity capital. In contrast to the results on the growth rate, we find that there is no significant relationship between the disclosure scores and the cost of equity capital (hence in the interest of brevity we do not report the results) In our analysis as described earlier, to back out the implied growth rate of residual income, we assumed the cost of capital was the same for each firm within the same industry. So as an added robustness check we use the price to earnings growth (PEG) estimate using the two year ahead (eps_2) and one year ahead analyst forecast(eps_1) of earnings and current prices (P_0), $repEG = \sqrt{(eps_2 - eps_1)/P_0}$ as an alternative measure of the cost of equity capital (Easton, 2004; Botosan and Plumlee, 2005). Our results remain unchanged.

6. Discussion and conclusion

In this paper we examine the link between environmental and social disclosures of a firm and its profitability and market value. The strongest result emerging from our profitability analysis is the positive link between past profitability and current social disclosures. It appears that profitable companies have the resources to invest in stakeholder engagement practices particularly with respect to their employees. Good relations and effective communication with these key stakeholders (as evidenced by higher and more objective social disclosures) can help build a firm's reputation and trust which in turn can help reduce transaction costs and distributional conflicts with these stakeholders. As our market value analysis reveals, investors also appear to value this corporate communication, Moreover our finding of the driver in value coming from the expected growth rate of cash flows, supports our assertions that firms are expected to reap real economic benefits from enhanced social disclosures. Overall, these results are consistent with the predictions of the RBV as well as the voluntary disclosure theory. In the context of these theories, such disclosures can be seen as part of the overall competitive strategy of the firm, aimed at bringing both non-financial as well as financial rewards.

Finally, our finding of no impact of disclosures on the cost of equity capital is consistent with the conclusions of Armitage and Marston (2008) that the main benefits of disclosure as seen by practitioners, is a reputation for openness and the building of shareholder confidence. In the context of this finding they pose a question for future research, as to '*why many executives regard promotion of confidence amongst investors and a reputation for openness as the primary benefits of corporate communication*?' (Armitage & Marston, 2008, 334). Towards an answer

they suggest that perhaps this reputation is an intangible asset that can bring commercial benefits. Our findings of the effect of disclosures on market value and its channel (i.e. expected growth rate of cash flows) is consistent with this suggestion.

It is worth noting at this point that one important limitation of our study is that it relates only to large listed companies in UK. Environmental and social responsibility is becoming important for all types of companies, big and small. To gain a more complete understanding of disclosures, future work could investigate smaller listed firms and their disclosure practices, the motivations for these practices and their consequences. This is important as any future regulation in this area may have different economic implications for small and large firms. There is a suggestion in the literature that the impact of disclosure varies according to the informational climate (Leuz & Verrecchia, 2000), so future research could test these findings in different institutional settings. Finally, research to date has mainly focused on environmental disclosures. With increased focus on firm sustainability and stakeholder management practices in general, future research could fruitfully focus on social performance, social disclosures and their link with economic performance.

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Table 1: Variable definitions, measures and data sources

Category	Measure	Definition/Measurement	Source
Environment and social disclosures	E	Environmental score (60 environmental data points adjusted by industry and weighted by importance) ranges from 0 to 100 as percentage.	Bloomberg
	S	Social score (26 social data points adjusted by industry and weighted by importance) ranges from 0 to 100 as percentage.	Bloomberg
Slack	Slack	Slack resources – natural logarithm of the sum of cash & short-term investments (02001) and total receivables (02051)	Datastream
Operating Profitability	ROA	Return on assets – the ratio of earnings before interest and taxes (18191) to total assets (02999) at the beginning of the year i.e. $EBIT_t/TA_{t-1}$	Datastream
	ROE	Return on equity (DWRE) - the ratio of net income before preferred dividends minus preferred dividend requirement to last year's common equity. The calculation differs from Worldscope. Datastream data is based on the current period, and Worldscope is an average of prior and current period Equity.	Datastream
	ROS	Return on sales – the ratio of earnings before interest and taxes (18191) to net sales (01001)	Datastream
Firm Size	Size_emp	Size – natural logarithm of employee number (07011)	Datastream
	Size_sales	Size – natural logarithm of net sales (01001)	Datastream
Other firm characteristics	Leverage	Leverage - Total debt (03255) divided by total assets (02999)	Datastream
	Fin_acts	Financial activities - the ratio of net proceeds from sale/issue of common and/or preferred stock (04251) during the year divided by total assets (02999) at the beginning of the year.	Datastream
	Media	Media exposure – natural logarithm of the number of environmental news exposed. It is obtained by searching company's name and any one of the terms 'environment sustainability', 'waste management', 'pollution' and 'environmental award' within all English language news published over the world. Specific date for each year is from 1 January 200X to 31 December 200X.	Nexis@UK
	Str_holds	Strategic holdings - the percentage of total shares in issue held strategically and not available to ordinary shareholders (NOSHST). Holdings of 5% or more are counted as strategic.	Datastream
	RDPS	Research and Development Expenditure per Share-Research and Development (01201) divided by the number of shares outstanding (05301).	Datastream
	BVPS	Book Value per share- price of the company on its books (03501) divided by the number of shares outstanding (05301).	Datastream
	EPS	Earnings per share – Net Income (01751) divided by the number of shares outstanding (05301).	Datastream
	Price	End of June Price – (P)	Datastream
Capital market	AnaRec	Analyst coverage - number of analysts issuing earnings forecasts for the firm.	IBES
	Analysts forecast EPS	Analyst Mean Forecast of EPS, 1 and 2 years ahead	IBES

Table 2. Descriptive statistics

Table 2 reports the descriptive statistics of the sample. E is the environmental disclosure score, S is the social disclosure score and ES is the sum of environmental and social scores. E; ESt_1, Et_1 and St_1: are the one year lagged ES score, E score and S score respectively. ROSt_1 is the one year lagged ROS. All other variables are as defined in Table 1.

Variable	Mean	Median	SD	IQR
E	21.39	19.38	12.20	18.60
S	31.74	28.07	11.84	15.79
ES	53.13	49.22	21.37	31.29
Et_1	21.74	20.16	12.42	18.60
St_1	32.37	28.07	11.97	19.30
ESt_1	54.30	50.99	21.80	31.91
Qratio	1.82	1.51	1.36	0.88
Slack	6.00	5.86	1.39	1.82
ROA	0.12	0.10	0.12	0.10
ROS	0.12	0.11	0.15	0.12
ROSt_1	0.14	0.12	0.14	0.13
Size_emp	9.36	9.34	1.46	1.84
Size_sales	14.41	14.26	1.31	1.81
Leverage	0.25	0.23	0.17	0.26
Fin_acts	0.02	0.00	0.06	0.01
Str_holds	0.19	0.15	0.16	0.20
Media	1.47	1.10	1.43	2.30
AnaRec	13.50	13.00	5.84	8.00
price	5.26	3.93	4.50	4.83
bvps	1.95	1.43	1.63	1.76
EPS	0.39	0.30	0.33	0.32
rdps	0.04	0.00	0.12	0.02

Table 3. Pair-wise correlation matrix

Table 3 reports the pairwise correlations between the variables. All the variables are defined in the same way as in Table 1. In Table 4, 1:E; 2:S; 3:ES; 4:Envt_1; 5:Soct_1; 6:ESt_1; 7:Qratio; 8:Slack; 9:ROA; 10:ROS; 11:ROSt_1; 12:Size_emp; 13:Size_sales; 14:Leverage; 15:Fin_acts; 16:Str_Holds;17:Media; 18:Analyst Coverage; 19:price; 20:bvps; 21:EPS; 22:rdps

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	1.00																					
2	0.58	1.00																				
3	0.89	0.89	1.00																			
4	0.85	0.56	0.79	1.00																		
5	0.59	0.87	0.82	0.60	1.00																	
6	0.80	0.80	0.89	0.90	0.89	1.00																
7	-0.01	0.06	0.03	0.13	0.16	0.16	1.00															
8	0.40	0.54	0.53	0.45	0.56	0.57	-0.16	1.00														
9	-0.07	-0.11	-0.10	-0.02	-0.04	-0.04	0.59	-0.17	1.00													
10	0.04	0.00	0.02	0.02	0.08	0.07	0.25	0.00	0.58	1.00												
11	0.02	0.02	0.02	0.03	-0.01	0.02	0.13	-0.06	0.22	0.49	1.00											
12	0.32	0.34	0.38	0.34	0.34	0.38	-0.20	0.64	-0.19	-0.21	-0.30	1.00										
13	0.45	0.49	0.53	0.49	0.51	0.56	-0.22	0.86	-0.18	-0.10	-0.16	0.80	1.00									
14	0.05	0.00	0.03	0.08	0.03	0.08	-0.23	0.15	-0.13	0.15	0.23	0.22	0.17	1.00								
15	0.06	0.07	0.08	0.14	0.14	0.15	0.17	0.03	0.00	-0.05	0.04	0.04	0.00	-0.01	1.00							
16	-0.27	-0.25	-0.29	-0.30	-0.31	-0.35	0.07	-0.39	0.03	-0.10	-0.10	-0.24	-0.32	-0.16	-0.10	1.00						
17	0.38	0.45	0.47	0.40	0.49	0.50	-0.04	0.58	-0.05	0.09	0.07	0.45	0.62	0.23	-0.03	-0.29	1.00					
18	0.36	0.37	0.41	0.32	0.34	0.37	0.01	0.48	-0.03	0.05	0.07	0.51	0.60	0.18	-0.01	-0.26	0.44	1.00				
19	0.20	0.11	0.17	0.26	0.17	0.25	0.20	0.19	0.28	0.30	0.28	0.04	0.15	-0.01	0.00	-0.19	0.13	0.06	1.00			
20	0.12	-0.07	0.03	0.16	-0.02	0.08	-0.26	0.07	-0.13	0.09	0.18	-0.04	0.10	-0.06	-0.06	-0.09	0.02	-0.03	0.49	1.00		
21	0.25	0.08	0.18	0.28	0.16	0.25	0.00	0.20	0.15	0.21	0.26	0.08	0.23	0.06	0.00	-0.22	0.13	0.07	0.81	0.61	1.00	
22	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.17	0.09	0.09	0.09	0.08	0.06	-0.07	-0.04	-0.11	0.09	0.07	0.18	0.01	0.14	1.00

Table 4. Determinants of E/S/ES disclosures (Equation 1)

Table 4 reports the results of the Tobit regressions explaining the E/S/ES scores. The dependent variables are ES, E and S scores. The t-statistics using standard errors clustered by firm and year are in parentheses. *, **, *** indicates significance at 10%, 5% and 1% levels respectively. The industries classification is based on FTSE/DJ single-digit Industry Classification Benchmark (ICB). All the variables are as defined in the in Table 1.

	Dependent variable		
	E	**S**	**ES**
ROS	3.545**	-1.487	2.175
	(2.52)	(-0.96)	(0.80)
Slack	1.515**	1.850**	3.465***
	(2.00)	(2.23)	(2.44)
Size_emp	1.770**	1.546*	3.208***
	(2.38)	(1.91)	(2.32)
Leverage	-3.043	-0.421	-2.652
	(-0.86)	(-0.11)	(-0.42)
Fin_acts	0.784	-9.301	-8.946
	(0.08)	(-1.42)	(-0.64)
Str_holds	-11.54***	-2.225	-13.49**
	(-2.92)	(-0.57)	(-1.95)
Media	1.589***	1.421**	2.968***
	(2.69)	(2.50)	(2.88)
Intercept	-4.600	9.299	-6.181
	(-0.83)	(1.42)	(0.61)
Industry Effects	yes	yes	yes
Time Effects	yes	yes	yes
R-squared	0.0624	0.0692	0.0709
F-statistic	12.48***	14.42***	16.68***

Table 5: Granger Causality tests of Disclosures and Profitability

Table 5 reports the results of causality models with Tobit specifications when dependent variable is ES, E or S score (Equations 2 and 3). OLS regressions are used when the dependent variable is ROS. The t-statistics using standard errors clustered by firm and year are in parenthesis. *, **, *** indicates significance at 10%, 5% and 1% levels respectively. The industries classification is based on FTSE/DJ single-digit Industry Classification Benchmark (ICB). All the variables are as defined in the in Table 1.

	Dependent Variable					
	E	**ROS**	**S**	**ROS**	**ES**	**ROS**
Envt_1	0.884***	0.002				
	(28.46)	(0.41)				
E		0.001				
		(0.93)				
Soct_1			0.863***	0.003		
			(24.85)	(1.53)		
S				-0.005		
				(-1.64)		
ESt1					0.925***	0.002
					(36.10)	(1.06)
ES						-0.001
						(-1.11)
ROS	0.473		-1.585		-1.223	
	(0.82)		(-1.40)		(-1.19)	
ROSt_1	0.765	0.127	0.909*	0.139	1.662**	0.136
	(0.98)	(0.88)	(1.69)	(1.03)	(2.41)	(1.00)
Slack	-0.491	0.014	0.130	0.019	-0.462	0.015
	(-1.15)	(0.91)	(0.30)	(1.13)	(-0.70)	(0.90)
Size_emp	1.046***	-0.054	0.691*	-0.042	1.472***	-0.047
	(2.92)	(-1.50)	(1.89)	(-1.51)	(2.77)	(-1.37)
Leverage	0.930	0.081	2.288	0.098**	1.965	0.0762
	(0.49)	(1.63)	(1.32)	(2.27)	(0.71)	(1.58)
Fin_acts	3.327	-0.092	-4.29	-0.136	-0.585	-0.092
	(0.64)	(-0.64)	(-1.29)	(-0.97)	(-0.09)	(-0.63)
Str_holds	-0.598	0.094	1.634	0.073	1.454	0.083
	(-0.27)	(0.75)	(0.96)	(0.76)	(0.49)	(0.79)
Media	0.056	0.006	-0.333	0.009	-0.377	0.006
	(0.17)	(0.66)	(-1.09)	(0.76)	(-0.74)	(0.69)
Intercept	-2.057	0.635	0.601	0.657*	-2.087	0.657
	(-0.82)	(1.64)	(0.27)	(1.86)	(-0.60)	(1.54)
Industry Effects	yes	yes	yes	yes	yes	yes
Year Effects	yes	yes	yes	yes	yes	yes
R-squared	0.198	0.170	0.224	0.172	0.220	0.162
F-Statistic	102.30***	9.31***	141.27***	9.77***	184.68***	9.32***

Table 6. Impact of E/S/ES disclosures on market value

Table 6 reports the results of regression of disclosure on stock price. The regression model is $P_{it}=\beta_0+\beta_1 BVPS_{it}+\beta_2 EPS_{it}+\beta_3 Disclosure_{it}+\beta_4 ROA_{it}+\beta_5 RDPS_{it}+\beta_6 SIZE_{it}+\beta_7 Leverage_{it}+\sum_{j=1}^{j=10}\beta_{8j} IND_{jit}+\varepsilon_{it}$. The t-statistics using standard errors clustered by firm and year are shown in parenthesis. *,** and *** denote significance at 10%, 5% and 1% levels respectively. The industries classification is based on FTSE/DJ single-digit Industry Classification Benchmark (ICB). All the variables are as defined in the in Table 1.

	Dependent Variable		
	price	**price**	**price**
bvps	0.224	0.262*	0.242
	(1.45)	(1.70)	(1.58)
eps	9.468***	9.429***	9.426***
	(9.60)	(9.84)	(9.70)
E	0.0120		
	(0.98)		
S		0.034***	
		(2.59)	
ES			0.015**
			(2.18)
ROA	5.908***	6.189***	6.032***
	(4.07)	(4.07)	(4.09)
rdps	3.393***	3.392***	3.399***
	(2.68)	(2.75)	(2.70)
Size_sales	0.012	-0.086	-0.061
	(0.11)	(-0.72)	(-0.53)
Leverage	1.020	1.162	1.102
	(1.31)	(1.51)	(1.43)
Industry Effects	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes
Intercept	3.189	3.251	3.506
	(1.39)	(1.44)	(1.53)
R-squared	0.692	0.696	0.694
F-Statistic	36.40***	35.26***	35.84***

Table 7. Impact of E/S/ES disclosure on growth rates

Table 7. Reports the results of the regression of growth rates on disclosure scores. g_{it} (grate) is an implied long run growth rate of residual income. The specific form of the regression is $g_{it}=\beta_0+\beta_1 Disclosure_{it}+\beta_2 RDPS_{it}+\beta_3 ROA_{it}+\beta_4 SIZE_{it}+\beta_5 Leverage_{it}+\sum_{j=1}^{j=10}\beta_{6j} IND_{jit}+\varepsilon_{it}$. The t-statistics using standard errors clustered by firm and year are shown in parenthesis. *, ** and *** denote significance at 10%, 5% and 1% level respectively. The industries classification is based on FTSE/DJ single-digit Industry Classification Benchmark (ICB).All the variables are as defined in the in Table 1.

	Dependent Variable		
	grate	**grate**	**grate**
E	0.001		
	(1.64)		
S		0.002***	
		(3.28)	
ES			0.001***
			(2.84)
rdps	0.0260	0.028	0.0272
	(0.87)	(0.98)	(0.93)
ROA	-0.078**	-0.069*	-0.074**
	(-2.07)	(-1.91)	(-1.98)
Size_sales	-0.005	-0.009**	-0.008*
	(-1.22)	(-2.10)	(-1.94)
Leverage	0.006	0.009	0.009
	(0.20)	(0.31)	(0.30)
Intercept	0.138**	0.137**	0.152***
	(2.40)	(2.47)	(2.64)
Industry Effects	yes	yes	yes
year Effects	yes	yes	yes
R-squared	0.294	0.310	0.305
F-Statistic	21.76***	20.71***	21.56***

Appendix 1: E and S indicators with Bloomberg fields

Environmental

Percent of Disclosure	PERCENT_OF_DISCLOSURE
Direct CO2 Emissions	DIRECT_CO2_EMISSIONS
Indirect CO2 Emissions	INDIRECT_CO2_EMISSIONS
Travel Emissions	TRAVEL_EMISSIONS
Total CO2 Emissions	TOTAL_CO2_EMISSIONS
CO2 Intensity (Tonnes)	CO2_INTENSITY
CO2 Intensity per Sales	CO2_INTENSITY_PER_SALES
GHG Scope 1	GHG_SCOPE_1
GHG Scope 2	GHG_SCOPE_2
GHG Scope 3	GHG_SCOPE_3
Total GHG Emissions	TOTAL_GHG_EMISSIONS
NOx Emissions	NOX_EMISSIONS
SO2 Emissions	SO2_EMISSIONS
SOx Emissions	SULPHUR_OXIDE_EMISSIONS
VOC Emissions	VOC_EMISSIONS
CO Emissions	CARBON_MONOXIDE_EMISSIONS
Methane Emissions	METHANE_EMISSIONS
ODS Emissions	ODS_EMISSIONS
Particulate Emissions	PARTICULATE_EMISSIONS
Total Energy Consumption	ENERGY_CONSUMPTION
Electricity Used (MWh)	ELECTRICITY_USED
Renewable Energy Use	RENEW_ENERGY_USE
Water Consumption	WATER_CONSUMPTION
Water/Unit of Prod (in Liters)	WATER_PER_UNIT_OF_PROD
% Water Recycled	PCT_WATER_RECYCLED
Discharges to Water	DISCHARGE_TO_WATER
Waste Water (Th Cubic Meters)	WASTE_WATER
Hazardous Waste	HAZARDOUS_WASTE
Total Waste	TOTAL_WASTE
Waste Recycled	WASTE_RECYCLED
Paper Consumption	PAPER_CONSUMPTION
Paper Recycled	PAPER_RECYCLED
Fuel Used (Th Liters)	FUEL_USED

Raw Materials Used	RAW_MAT_USED
% Recycled Materials	PCT_RECYCLED_MATERIALS
Gas Flaring	GAS_FLARING
Number of Spills	NUMBER_SPILLS
Amount of Spills (Th Tonnes)	AMOUNT_OF_SPILLS
Nuclear % Total Energy	NUCLEAR_%_ENERGY
Solar % Total Energy	SOLAR_%_ENERGY
Phones Recycled	PHONES_RECYCLED
Environmental Fines #	NUM_ENVIRON_FINES
Environmental Fines $	ENVIRON_FINES_AMT
ISO 14001 Certified Sites	ISO_14001_SITES
Number of Sites	NUMBER_OF_SITES
% Sites Certified	%_SITES_CERTIFIED
Environmental Accounting Cost	ENVIRONMENTAL_ACCTG_COST
Investments in Sustainability	INVESTMENTS_IN_SUSTAINABILITY
Energy Efficiency Policy	ENERGY_EFFIC_POLICY
Emissions Reduction Initiatives	EMISSION_REDUCTION
Environmental Supply Chain Management	ENVIRON_SUPPLY_MGT
Green Building Policy	GREEN_BUILDING
Waste Reduction Policy	WASTE_REDUCTION
Sustainable Packaging	SUSTAIN_PACKAGING
Environmental Quality Management Policy	ENVIRON_QUAL_MGT
Climate Change Policy	CLIMATE_CHG_POLICY
New Products - Climate Change	CLIMATE_CHG_PRODS
Biodiversity Policy	BIODIVERSITY_POLICY
Environmental Awards Received	ENVIRONMENTAL_AWARDS_RECEIVED
Verification Type	VERIFICATION_TYPE

Social

Number of Employees	NUMBER_EMPLOYEES_CSR
Employee Turnover %	EMPLOYEE_TURNOVER_PCT
% Employees Unionized	PCT_EMPLOYEES_UNIONIZED
Employee Average Age	EMPLOYEE_AVERAGE_AGE
% Women in Workforce	PCT_WOMEN_EMPLOYEES

% Women in Mgt	PCT_WOMEN_MGT
% Minorities in Workforce	PCT_MINORITY_EMPLOYEES
% Disabled in Workforce	PCT_DISABLED_IN_WORKFORCE
% Minorities in Mgt	PCT_MINORITY_MGT
Workforce Accidents	WORK_ACCIDENTS_EMPLOYEES
Lost Time from Accidents	LOST_TIME_ACCIDENTS
Lost Time Incident Rate	LOST_TIME_INCIDENT_RATE
Fatalities – Contractors	FATALITIES_CONTRACTORS
Fatalities – Employees	FATALITIES_EMPLOYEES
Fatalities – Total	FATALITIES_TOTAL
Community Spending	COMMUNITY_SPENDING
Employee Training Cost	EMPLOYEE_TRAINING_COST
SRI Assets Under Management	SRI_ASSETS_UNDER_MANAGEMENT
# Awards Received	AWARDS_RECEIVED
Health and Safety Policy	HEALTH_SAFETY_POLICY
Fair Remuneration Policy	FAIR_REMUNERATION_POLICY
Training Policy	TRAINING_POLICY
Employee CSR Training	EMPLOYEE_CSR_TRAINING
Equal Opportunity Policy	EQUAL_OPPORTUNITY_POLICY
Human Rights Policy	HUMAN_RIGHTS_POLICY
UN Global Compact Signatory	UN_GLOBAL_COMPACT_SIGNATORY