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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 relation between environmental disclosures and profitability. Further, while prior literature has largely focussed on environmental disclosure, 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 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 greater economic resources make more extensive disclosures which yield net positive economic benefits.

1. Introduction

From an economics perspective, producing objective[1] environmental (E) and social (S) disclosures entail real, proprietary, and opportunity costs (Armitage & Marston, 2008; Brammer & Pavelin, 2006, 2008; Buhr, 2002; Cormier & Magnan, 1999, 2003; Li & McConomy, 1999; Verrecchia, 1983, 2001). Yet, E and S disclosures by large listed companies in the UK (as in many countries around the world, Gray Javad, Power & Sinclair, 2001) have grown phenomenally over the years, rising from approximately a page devoted to employee related disclosure in the 1970s (Gray, Kouhy, & Lavers, 1995, p. 62) to detailed stand-alone sustainability reports issued by many listed companies in recent years. This trend is in line 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 (Brammer & Pavelin, 2006, 2008; Clarkson, Li, Richardson, & Vasvari, 2008, 2011; Cormier & Magnan, 1999, 2003; Deegan, 2004; Gray et al., 1995; Gray, Javad, Power, & Sinclair, 2001), 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[2] that larger, more 'visible' firms and those operating in more environmentally sensitive

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[1] By objective we mean 'hard' disclosures as used by Clarkson et al. (2008), which according to them, are quantifiable performance indicators.
[2] See e.g. Freedman and Jaggi (1988), Patten (1991), Gray et al. (1995), Hackston and Milne (1996), Gray et al. (2001), Cormier and Magnan (2003), Brammer and Pavelin (2006, 2008), Clarkson et al. (2011), and Guidry and Patten (2012).

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sectors are likely to make more extensive E and S disclosures. However, within this literature, the link between profitability and such disclosures remains as yet unclear.

Some scholars, drawing on the socio-political and legitimacy theory based arguments posit and find 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 (Hackston & Milne, 1996; Patten, 1991, 2002a; Walden & Schwartz, 1997). Others, consistent with the resource based view (RBV) of the firm (Hart, 1995; Russo & Fouts, 1997) and the economics based voluntary disclosure theory (VDT), (Verrecchia, 1983, 2001) argue that firms with superior environmental and economic performance have the incentives and the resources to convey their 'type' by making more extensive and objective E disclosures. Yet, studies taking this latter view provide less than convincing evidence, especially with respect to measures of economic performance (see e.g. Al-Tuwaijri, Christensen, & Hughes, 2004; Clarkson et al., 2008, 2011; Cormier & Magnan, 2003; Guidry & Patten, 2012). In this paper we revisit the relation between E and S disclosures and profitability as well as investigate the direction of causality, if any, between the two - an issue that prior research has identified as meriting attention (Brammer & Pavelin, 2006, 2008; Gray et al., 1995, 2001).

Within the E and S disclosure literature there is also an ongoing debate as to whether these disclosures are value-relevant. While some scholars theorise and find empirical support for the notion that these disclosures are mainly a 'legitimation tool', (Cho & Patten, 2007; Gray et al., 1995), others, consistent with the RBV and VDT theories, argue and find some empirical support that objective E disclosures are value-relevant (see Al-Tuwaijri et al., 2004; Clarkson, Li, Richardson, & Vasvari, 2011; Cormier & Magnan, 2007, 2013). RBV theorists (Hart, 1995; Russo & Fouts, 1997) argue that superior performance in the environmental arena and its effective communication can confer competitive advantages to the firm, including a strong positive reputation. Highlighting the importance of communicating the responsible environmental strategies of the firm to its external stakeholders, Hart (1995, p.999) states that such effective communication could '*reinforce and differentiate a firm's position through the positive effects of a good reputation*.' Supporting Hart's (1995) theoretical arguments, as well as integrating the legitimacy and VDT based arguments, Cormier and Magnan (2013) find that reliable and relevant environmental disclosures not only enhance a firm's environmental legitimacy but also help analysts make better earnings forecasts. We extend Cormier & Magnan's (2013) work by arguing that such objective and extensive E (and S) disclosures enhance a firm's reputation and bring economic benefits to the firm, including a higher share price.

While Cormier and Magnan (2013) focus on E disclosures, we also consider S disclosures which to date have received relatively scant attention (Cormier, Ledoux, & Magnan, 2011). As with E disclosures, more extensive and objective S disclosures can enhance a firm's reputation (Armitage & Marston, 2008; Hart, 1995) which should also be valued by investors. We further argue that the competitive advantages gained through a strong positive reputation can manifest in the form of enhanced ability of the firm to attract and retain higher quality human capital, higher customer and supplier loyalty, and increased firm sales. Thus, we argue that the effect of such competitive advantages will most likely be reflected in 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 E and S disclosures.

Consistent with the RBV and VDT theory based arguments, we find that more profitable firms with financial resource slack make higher S (but not E) disclosures and higher combined E and S disclosures. We also document a positive link between S (but not E) disclosures and the firm's share price. Moreover, we find the impact on share price to come through higher implied growth rates in the expected cash flows of such firms. While our results are based on the UK's institutional context, these can be of relevance in other institutional settings as well, as we discuss later.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature and presents the 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 checks and Section 6 concludes.

2. Literature review and hypotheses development

2.1. *Environmental and social disclosures and profitability*

While the extent and content of E and S disclosures are believed to vary by time, company, industry, and institutional context (Cormier & Magnan, 2007; Gray et al., 2001), evidence suggests that larger, more publicly visible firms, and those from more polluting industries are likely to make higher disclosures (Adams, Hill & Robert, 1998; Brammer & Pavelin, 2006, 2008; Cormier & Magnan, 1999, 2003; Gray et al., 1995, 2001; Hackston & Milne, 1996; Patten, 1991).

Legitimacy theorists argue that E and S 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 Cho & Patten, 2007; Gray et al., 1995; Hackston & Milne, 1996; Walden & Schwartz, 1997; Patten, 1991, 2002a, 2002b). This view is articulated well by Patten (1991, pp. 297–298) 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.*' In the study of the factors driving the social disclosures of a sample of 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 S disclosures. None of the profitability measures have a significant association with S 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 E disclosures. However following the 1991 paper, none of Patten's later studies focus on S disclosures, nor do they include any measures of profitability as determinants of disclosure (see Cho & Patten, 2007; Patten, 2002a, 2002b).

In contrast to the legitimacy perspective, other scholars either implicitly or explicitly draw on the RBV theory (Hart, 1995; Russo & Fouts, 1997) and the economics based VDT theory (Verrachia, 1983, 2001) and argue that superior environmental performers and/or those possessing superior economic resources are likely to make higher and better quality i.e. more objective E disclosures (see Al-Tuwaijri et al., 2004; Clarkson et al., 2008, 2011; Cormier & Magnan, 1999, 2003). However, while these studies find a positive link between superior environmental performance and E disclosures, the link of the latter with profitability is either not explicitly tested (e.g. Al-Tuwaijri et al., 2004) or is found not to be significant (Clarkson et al., 2008, 2011; Cormier & Magnan, 2003). Moreover, these studies do not test the relationship of profitability with any measures of S disclosures.

Despite the lack of any substantive evidence in the literature on (predominantly) E disclosures and firm operating performance, one can make a number of theoretical arguments as to why one should find a positive link between higher and more objective E and S disclosures and firm profitability. First, making 'hard' or quantified, objective E (and, possibly, S) disclosures entail significant real costs of production as they involve putting in place systems for identifying, measuring and reporting such information (see Brammer & Pavelin, 2008; Buhr, 2002; Larsen, 2000; Li & McConomy, 1999), costs which according to the RBV theory more profitable firms should be better able to incur. Second, consistent with the VDT theory, revealing objective information about a firm's environmental and social processes, practices, and performance can attract significant proprietary (including regulatory, contractual, and reputational) costs (Blacconiere & Patten, 1994; Cormier & Magnan, 1999). For example, revealing information about a firm's environmental technologies, environmental and social practices and performance cannot only be commercially sensitive, but being of interest to regulators, employees and other corporate stakeholders (like social and environmental activists groups) can also attract or pre-empt regulatory, contractual or reputational costs. Hence, as Cormier and Magnan (1999) argue, firms with better financial (and environmental/social performance) should be more willing to incur these costs. Finally, by making objective disclosures, firms incur opportunity costs of lowered future strategic managerial discretion that comes from making public commitments to verifiable current and future actions (Brammer & Pavelin, 2008, p.122). Hence, based on these arguments, it is reasonable to expect that firms with higher profitability and resource slack should make more extensive and objective E and S disclosures. Accordingly, we hypothesize that:

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

It is important to note that in the hypothesis above we assume the causality to run from profitability to E and S disclosures. However, it is worth noting that concern has been raised in the broader corporate social responsibility (CSR) literature about the direction of causality between CSR and financial performance, in that superior CSR performance could lead to enhanced financial performance and vice-versa (Hillman & Keim, 2001; Waddock & Graves, 1997). Within the disclosure literature, Brammer and Pavelin (2006, 2008) note the possibility of reverse causality between E disclosures and firm profitability, though they do not elaborate on it nor test for it. While in motivating H1 we elaborate on the reasons why we believe profitability should drive disclosures, it is also entirely plausible to argue that more extensive and objective E and S disclosures can enhance a firm's profitability by building its reputation. It can do so, for example, by enabling a firm to attract more capable, competent, and productive human capital, by building brand loyalty, and by broadening the customer base (Armitage & Marston, 2008). These in fact are the arguments we make to motivate H3. Finally, it is also possible that a "virtuous circle" exists (Nelling & Webb, 2009) and causality, if any, runs in both directions. To date, however, the direction of causality remains an open empirical question (Brammer & Pavelin, 2006, 2008; Gray et al., 1995, 2001). In our study, drawing upon Nelling & Webb's (2009) application of Granger causality, we explicitly test for causality between our sample firms' profitability and their E and S disclosures.

2.2. Environmental and social disclosures and firm value

As we have argued above, more extensive and objective E and S disclosures can confer competitive advantages to a firm including a strong reputation (Armitage & Marston, 2008; Hart, 1995; Russo & Fouts, 1997). Moreover, with increasing societal and regulatory pressure, investors are also becoming more interested in E and S disclosures of their investee companies (Cormier & Magnan, 2007; Friedman & Miles, 2001). It is reasonable then to expect that firms which produce more extensive and objective E and S disclosures are likely to be viewed more favourably by investors. Thus, consistent with the predictions of the RBV (Hart, 1995; Russo & Fouts, 1997) and VDT theory (Verrecchia, 1983, 2001), one can argue that firms that make more extensive and objective E and S disclosures are likely to benefit from higher share prices. Empirically however, many prior studies find a negative link between a firm's (mainly E) disclosures and its share price performance (e.g. Freedman & Patten, 2004; Lorraine, Collinson & Power, 2004; Shane & Spicer, 1983; Stevens, 1984). 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) note could be responsible for the negative stock market impact documented in the literature. 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, Collison, and Power (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 E disclosure, however, finds a positive link between such disclosures and the market value of a firm.

At this point it is worth noting that while E disclosures have been frequently studied, S 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. They 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 large Canadian firms, they find a positive link between the information precision of S disclosures and firm market value.

Consistent with Cormier et al.'s (2009) findings, we argue that S disclosures are also likely to be value-relevant for a number of reasons. First, a strong reputation in the social arena, as reflected by more extensive and objective S disclosures (e.g. by reporting the firm's practices in terms of diversity, equality of pay, fair trade etc.), can help a firm attract and retain quality employees (Cormier et al., 2011), enhance employee morale and hence productivity (Siegel, 2009), and by building goodwill and trust with its key stakeholders, help reduce the firm's transaction costs (e.g. lower employee turnover) and distributional conflicts (e.g. by reporting the firm's practices in terms of diversity, equality of pay, fair trade terms etc.). Hence, objective and extensive E and S disclosures should have positive implications for a firm's market value as measured by its share price. Based on these arguments, we hypothesize that:

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

2.3. Environmental and social disclosures and firm's expected cash flows

The preceding discussion argues that extensive and objective E and S disclosures can enhance a firm's share price, as they help create a positive and strong firm reputation as well as other competitive advantages. These advantages can manifest in the form of higher sales (by building brand loyalty and expanding customer base), lower transaction costs (e.g. by building employee and supplier trust and loyalty) as well as lower firm monitoring costs (Cormier et al., 2011; Stulz, 1999). Hence, such disclosures can reduce the firm costs as well as bring real economic benefits which we argue would enhance the firm's expected cash flows. To this effect, scholars (Cooper, 2006; Godfrey, Merrill, & Hansen, 2009) also argue that building good will with key stakeholders through effective CSR (and its disclosure) can bring significant benefits in the form of reduced cash flow shock when a negative event occurs. Based on these arguments, we propose that the effect on market value, of higher E and S disclosures is likely to manifest through higher expected growth rates in the cash flows of such firms (Clarkson, Guedes, & Thompson, 1996). Accordingly we hypothesize that:

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

3. Sample, variables and models

3.1. Sample

Our sample consists of the constituents of the FTSE350 index covering the years 2005–2009. We exclude financial companies[3] as these follow a different set of environmental and social regulations like the 'Equator Principles'[4] (Macve & Chen, 2010). This reduces our sample by about a 100 firms each year. Further, based on the availability of E and S disclosure scores, we are left with a final sample consisting of 11, 87, 165, 214, and 152 firms for the years 2005, 2006, 2007, 2008, and 2009, 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 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 the variables, their measurement and sources. The financial variables are obtained from Datastream. Environmental news data used for constructing the media coverage variable is obtained from Nexis@UK. We obtain the consensus (mean) analysts' forecasts of earnings and dividends and the analyst coverage data from Thomson Reuters

[3] 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 from this study.

[4] Equator Principles is a risk management framework adopted by financial institutions for determining, assessing and managing environmental and social risk in projects.

Table 1
Variable definitions, measurement and 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
Environment and social performance	A4E A4S	A4E is the Environmental and A4S is the Social performance score. Asset 4 collects data from sources such as sustainability/CSR reports, annual reports, company websites, proxy filings etc. For each company, over 750 data points are collected, these are combined into over 250 key performance indicators (KPIs). These KPIs are integrated into 18 categories and grouped within four pillars: Economic; environment; Social and Corporate Governance. The scores are normalized using z-scoring (lies between 0 and 100%), equally weighted and benchmarked against the complete universe of companies. All the individual data points, KPI, category, pillar and overall scores are available. A4E and A4S are the environmental and social pillar scores. Further information can be found here http://extranet.datastream.com/data/ASSET4%20ESG/Index.htm	Thomson Reuters Asset 4
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

Institutional Brokers' Estimate System (IBES). Finally, the E/S/ES performance scores used in some of the analyses are sourced from Thomson Reuters Asset 4 database and retrieved from Datastream.

The primary variables of interest in this study are the E and S disclosure scores of companies developed by Bloomberg. Bloomberg assigns these scores based on the number of 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 for example, 'Phones Recycled' is only considered in the score for telecommunications companies and not for other sectors. Similarly, 'Gas Flaring' only goes into computing the disclosure score for oil and gas exploration and production companies while companies in other sectors are not penalized for not disclosing it. The data points are also weighted (using a proprietary weighting system), 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 also the quality of E and S 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. While relatively new in the disclosure literature, the Bloomberg disclosure scores have been used in recent studies including those by Eccles, Serafeim, and Krzus (2011) and Utz and Wimmer (2014).

The E score covers various types of environmental information that could broadly be classified as 'hard' items or '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 E disclosure items covered are 'hard' objective data items, while only 20% (12 out of 60) are 'soft' data points. Thus, these E scores largely capture a firm's 'hard' E disclosures, which as Cormier and Magnan (2013) argue are likely to enhance a firm's environmental legitimacy, and as Clarkson et al. (2008) argue, are also likely to reflect superior E performance. Also, as Cormier et al. (2009) find, such E disclosures are also more likely to reduce 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 73% of S disclosure score is based on 'hard' items while 'soft' information makes up about 27% of the score (i.e. 7 out of 26 data points). Therefore, the S disclosure score is also likely to be reflective of a firm's actual social performance. Hence, such S disclosures are also likely to enhance a firm's social legitimacy, its social reputation and as Cormier et al. (2009) argue, help reduce the information asymmetry between the firm and its investors. In our analysis, we use the E disclosure score, the S disclosure score and the sum of E and S disclosure score which can be interpreted as the firm's aggregate environmental and social (ES) disclosure score.

3.3. Models

In the following section we describe the specific models used in our analyses. For the profitability analysis, to account for the possibility of reverse causality, we develop Equations (1) and (2) based on Nelling & Webb's (2009) application of Granger causality. While Equation (1) specifically tests H1, Equation (2) tests for the possibility of reverse causality. Below we discuss each model in detail.

$$\begin{aligned}\text{Disclosure Score}_{it} = {} & \beta_0 + \beta_1\text{Disclosure Score}_{it-1} + \beta_2\text{Profitability}_{it} + \beta_3\text{Profitability}_{it\text{-}1} + \beta_4\text{Slack}_{it} + \beta_5\text{Size}_{it} \\ & + \beta_6\text{Leverage}_{it} + \beta_7\text{Financial Activities}_{it} + \beta_8\text{Strategic Holdings}_{it} + \beta_9\text{Media Exposure}_{it} \\ & + \sum_{j=1}^{j=9}\beta_{10j}\text{IND}_{jit} + \sum_{j=2006}^{j=2009}\beta_{11j}\text{year}_{jit} + \varepsilon_{it}\end{aligned} \tag{1}$$

$$\begin{aligned}\text{Profitability}_{it} = {} & \beta_0 + \beta_1\text{Profitability}_{it-1} + \beta_2\text{Disclosure Score}_{it} + \beta_3\text{Disclosure Score}_{it\text{-}1} + \beta_4\text{Slack}_{it} + \beta_5\text{Size}_{it} \\ & + \beta_6\text{Leverage}_{it} + \beta_7\text{Financial Activities}_{it} + \beta_8\text{Strategic Holdings}_{it} + \beta_9\text{Media Exposure}_{it} \\ & + \sum_{j=1}^{j=9}\beta_{10j}\text{IND}_{jit} + \sum_{j=2006}^{j=2009}\beta_{11j}\text{year}_{jit} + \varepsilon_{it}\end{aligned} \tag{2}$$

In Equation (1), disclosure score (E/S/ES) is a function of lagged disclosure score, current profitability, and lagged profitability, while in Equation (2), profitability is a function of lagged profitability, and current and lagged disclosure score. If the coefficients β_2 and β_3 are significant in Equation (1), we conclude that firms' profitability 'Granger causes' disclosure. Similarly, if the coefficients β_2 and β_3 in Equation (2) are significant, then we conclude that firms' disclosure 'Granger causes' profitability.

The measure of profitability is return on sales (ROS). The choice of this measure is driven by its use in prior related literature (Callan & Thomas, 2009; Graves & Waddock, 2000; Hart & Ahuja, 1996) 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, p. 8).

Following prior literature, we control for firm size (Brammer & Pavelin, 2006, 2008; Cormier & Magnan, 1999, 2003; Dhaliwal, Li, Tsang, & Yang, 2011; Patten, 1991), leverage (Brammer & Pavelin, 2006, 2008; Cormier et al., 2011; Cormier & Magnan, 1999, 2003), financial activities (Cormier & Magnan, 1999; Dhaliwal et al., 2011), media exposure (Brammer & Pavelin, 2006; Cormier & Magnan, 2003), block holdings (Brammer & Pavelin, 2006; Cormier & Magnan, 1999, 2003), slack (Arora & Dharwadkar, 2011), industry (Patten, 1991), and year indicator variables.[5]

To test 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:

[5] In this analysis we do not include E/S/ES performance scores as controls due to potential endogeneity concerns. There is a suggestion in the literature that both E/S/ES disclosure and performance could be simultaneously determined by unobserved managerial qualities (see e.g. Al-Tujawari et al. (2004) and Clarkson et al. (2008 and 2011).

$$P_{it} = \beta_0 + \beta_1 BVPS_{it} + \beta_2 EPS_{it} + \beta_3 \text{Disclosure Score}_{it} + \beta_4 \text{Performance Score}_{it} + \beta_5 ROA_{it} + \beta_6 RDPS_{it} + \beta_7 Size_{it} + \beta_8 Leverage_{it} + \sum_{j=1}^{j=9} \beta_{9j} IND_{jit} + \sum_{j=2006}^{j=2009} \beta_{10j} year_{jit} + \varepsilon_{it} \tag{3}$$

In Equation (3), P_{it} is the firm *i*'s share price at time *t*. $BVPS_{it}$ is the book value per share, EPS_{it} is earnings per share and disclosure score is either the E/S or ES score for firm *i* in year *t*. In Equation (3) we also include E/S/ES performance score, proxies for firm size, profitability, and leverage as control variables. In addition, we control for the effect of intangibles on firm value using R&D expenditure per share. Given that disclosure scores and performance scores may be correlated, we check for any potential multicollinearity issues using variance inflation factors and find it not to be the case.

To test H3, we use a model based on Lee, Myers, and Swaminathan (1999) as in (4) below:

$$p_t = b_t + \sum_{\tau=1}^{n} \frac{(FROE_{t+\tau} - r_e)}{(1+r_e)} b_{t+\tau-1} + \frac{(FROE_n - r_e) b_{n-1}(1+g)}{(r_e - g)(1+r_e)^n} \tag{4}$$

In Equation (4), 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 $t+\tau$, 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. Since analyst forecasts for UK firms are most complete for forecast periods up to two years ahead, in our implementation of (4) we restrict n to 2. To estimate the cost of equity capital, r_e, required in (4) we mainly follow Gregory, Tharyan, and Whittaker (2013). Gregory et al. (2013) note that the cost of capital differences between firms are driven mainly by industry effects and therefore we use the industry cost of capital as a proxy for the firm's 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 $\times$ the market risk premium) where r_f is the 3 month UK treasury bill rate (the risk-free rate) and the market risk premium is assumed to be 4.3% and is based on estimates from Dimson (2011).[6] 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, Equation (4) 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 book values 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 E/S/ES disclosure scores on the long run implied growth rates by a regression of the growth rate g on the E/S/ES scores and control variables including E/S/ES performance score, profitability (ROA), a proxy for firm size (Lo & Sheu, 2007; Weir, Lang & McKnight, 2002), leverage (Weir, Laing, & McKnight, 2002), R&D expenditure, and indicator variables for industry membership. As in previous analysis, we again check for potential collinearity between disclosure and performance scores, using variance inflation factors, and find it not to be a problem. The specific model is as follows:

$$g_{it} = \beta_0 + \beta_1 \text{Disclosure Score}_{it} + \beta_2 \text{Performance Score}_{it} + \beta_3 RDPS_{it} + \beta_4 ROA_{it} + \beta_5 Size_{it} + \beta_6 Leverage_{it} + \sum_{j=1}^{j=9} \beta_{7j} IND_{jit} + \sum_{j=2006}^{j=2009} \beta_{8j} year_{jit} + \varepsilon_{it} \tag{5}$$

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

4. Results

Table 2 shows that the S disclosure has a mean score of 32% and E disclosure of 21%. This suggests that on average our sample of firms make more extensive S disclosures than E disclosures. Consistent with this pattern, the average E performance score is also slightly lower than the S performance score. The average slack (which is the natural log of the sum of cash and 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 block shareholdings (i.e. shareholdings of 5% or more, Datastream classification) and financial activities (new equity raised as a percentage 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 related to a firm 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.

[6] 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.

Table 2
Descriptive statistics.

Variable	Mean	Median	SD	IQR
E	21.27	19.38	12.19	18.60
S	31.64	28.07	11.78	15.79
ES	52.91	49.41	21.37	31.46
A4E	65.69	72.77	24.21	39.27
A4S	68.79	73.41	22.67	34.47
A4ES	134.47	144.71	43.25	63.60
Et_1	21.63	20.16	12.26	18.60
St_1	32.18	28.07	12.06	19.30
ESt_1	54.09	50.99	21.58	31.62
Q-ratio	1.83	1.51	1.36	0.90
Slack	6.00	5.86	1.38	1.82
ROE	0.23	0.18	0.38	0.21
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	9.32	9.32	1.49	1.91
Size_sales	14.39	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	1.44	2.40
AnaRec	13.46	13.00	5.87	8.00
Price	5.19	3.86	4.44	4.83
BVPS	1.95	1.42	1.63	1.76
EPS	0.38	0.28	0.33	0.32
RDPS	0.04	0.00	0.12	0.02

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 disclosure scores. Et_1, St_1 and ESt_1: are the one year lagged E, S and ES scores respectively. ROSt_1 is the one year lagged ROS. A4E, A4S and A4ES are the E, S and ES performance scores. All other variables are as defined in Table 1. IQR is the interquartile range.

As can be seen in Table 3, there is a high correlation among all disclosure scores and their lagged values, which suggests the stickiness of these scores across years. It seems that once a firm starts reporting in a particular area, it continues to do so in subsequent periods, consistent with the costs of commitment argument. The positive and significant correlation of 0.56 between E disclosure and E performance scores and 0.45 between S disclosure and S performance scores is consistent with the VDT theory view that companies with better E/S/ES performance have the incentives to convey their ‘type’ by making more extensive and objective disclosures. 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 of book value per share (0.50) and of earnings per share (0.82) with market price per share, suggesting that both are highly value-relevant. We now turn to the results of the tests of our hypotheses.

Table 4 reports the results of testing H1 and the reverse causality test with respect to disclosure scores and firm profitability. While we do not find any evidence of causality running from disclosures to profitability, consistent with H1 we find evidence of causality from lagged profitability to S and combined ES disclosure scores. This finding suggests that firms which have some track record of being profitable have the resources and the 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). Our findings suggest that firms would be willing to enter into such commitments and publicly disclose these only if they have the economic means to do so, hence the link of lagged profitability with S disclosures. This finding is also consistent with prior UK evidence, which shows that over the years, companies 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, all control variables other than size 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 in such analyses (consistent with the costs of commitment argument). We now turn to the issue of value-relevance of E and S disclosures (H2). Table 5 presents the regression results of testing H2.

Consistent with H2, we find a positive and significant association between the overall ES disclosure and the firm's stock price. At a disaggregated level, we find similar results for S disclosure, though not for E disclosure. In some ways, this finding is quite surprising, given the preponderance in the literature of the capital market implications of environmental performance and environmental disclosures. Our findings suggest that while the academia has focused more on environmental issues in CSR research, it is social issues that matter more to investors. As we also control for S performance, the implication of our results is that S disclosure has an impact on firm value over and beyond that of S performance. While novel in this stream of

Table 3
Pair-wise correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	1.00																									
2	0.58	1.00																								
3	0.89	0.88	1.00																							
4	0.54	0.38	0.52	1.00																						
5	0.56	0.45	0.57	0.75	1.00																					
6	0.58	0.44	0.58	0.94	0.93	1.00																				
7	0.84	0.54	0.78	0.59	0.55	0.61	1.00																			
8	0.56	0.86	0.80	0.41	0.46	0.46	0.57	1.00																		
9	0.79	0.79	0.89	0.57	0.57	0.61	0.89	0.88	1.00																	
10	0.00	0.05	0.03	−0.15	−0.01	−0.09	0.01	0.05	0.04	1.00																
11	0.40	0.55	0.53	0.46	0.49	0.51	0.44	0.56	0.56	−0.09	1.00															
12	0.13	0.03	0.09	−0.11	−0.05	−0.09	0.03	0.06	0.05	0.23	0.04	1.00														
13	0.03	−0.03	0.00	−0.18	−0.08	−0.14	−0.01	0.00	−0.01	0.47	−0.04	0.42	1.00													
14	0.08	0.05	0.07	−0.09	−0.03	−0.07	0.05	0.13	0.10	0.24	0.07	0.27	0.66	1.00												
15	0.04	0.06	0.05	−0.09	−0.07	−0.08	0.07	0.05	0.07	0.21	−0.01	0.05	0.25	0.44	1.00											
16	0.33	0.33	0.37	0.41	0.50	0.49	0.33	0.32	0.36	−0.18	0.64	0.10	−0.05	−0.11	−0.24	1.00										
17	0.45	0.48	0.53	0.53	0.58	0.59	0.48	0.49	0.55	−0.20	0.86	0.03	−0.06	−0.03	−0.12	0.81	1.00									
18	0.09	0.05	0.08	0.09	0.17	0.13	0.12	0.07	0.11	−0.18	0.15	0.09	−0.12	0.07	0.14	0.22	0.18	1.00								
19	0.12	0.03	0.08	0.02	0.12	0.07	0.09	0.05	0.08	0.05	0.09	−0.02	0.03	0.00	0.10	0.05	0.06	0.05	1.00							
20	−0.28	−0.27	−0.31	−0.37	−0.34	−0.38	−0.32	−0.31	−0.35	−0.04	−0.38	−0.11	−0.13	−0.15	−0.12	−0.22	−0.31	−0.17	−0.10	1.00						
21	0.35	0.44	0.44	0.39	0.39	0.42	0.38	0.47	0.48	−0.03	0.58	0.07	0.04	0.13	0.09	0.43	0.62	0.25	−0.06	−0.29	1.00					
22	0.39	0.39	0.44	0.31	0.48	0.42	0.35	0.38	0.41	0.08	0.46	0.06	0.06	0.09	0.05	0.49	0.59	0.18	−0.03	−0.30	0.47	1.00				
23	0.26	0.17	0.25	0.13	0.19	0.17	0.27	0.20	0.27	0.34	0.27	0.34	0.33	0.34	0.30	0.13	0.22	0.02	0.10	−0.24	0.16	0.14	1.00			
24	0.14	−0.04	0.06	0.21	0.07	0.15	0.20	0.01	0.12	−0.28	0.10	−0.13	−0.11	0.10	0.16	0.00	0.13	−0.11	0.03	−0.06	0.04	−0.01	0.50	1.00		
25	0.27	0.10	0.21	0.17	0.15	0.17	0.28	0.17	0.26	0.08	0.25	0.34	0.23	0.23	0.26	0.17	0.28	0.08	0.06	−0.25	0.16	0.10	0.82	0.57	1.00	
26	0.04	0.03	0.04	0.07	−0.01	0.03	0.06	0.07	0.08	0.15	0.16	0.05	0.15	0.12	0.11	0.09	0.06	−0.04	−0.04	−0.13	0.09	0.07	0.20	0.00	0.18	1.00

Table 3 reports the pairwise correlations between the variables. 1:E; 2:S; 3:ES; 4:A4E, 5:A4S, 6:A4ES; 7:E_{t_1}; 8:S_{t_1}; 9:ES_{t_1}; 10:Qratio; 11:Slack; 12: ROE; 13:ROA; 14:ROS; 15:ROS_{t_1}; 16:Size_emp; 17:Size_sales; 18:Leverage; 19:Fin_acts; 20:Str_Holds; 21:Media; 22:Analyst Coverage; 23:price; 24:BVPS; 25:EPS; 26:RDPS. All the variables are as defined in Table 1.

Table 4
Link between disclosures and profitability.

	Dependent variable					
	E	ROS	S	ROS	ES	ROS
Env_{t_1}	0.884***	0.002				
	(28.46)	(0.41)				
E		0.001				
		(0.93)				
S_{t_1}			0.863***	0.003		
			(24.85)	(1.53)		
S				−0.005		
				(−1.64)		
Es_{t_1}					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)	
ROS_{t_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 4 reports the results of testing Hypothesis 1 and reverse causality between disclosures and profitability. The industries classification is based on FTSE/DJ single-digit Industry Classification Benchmark (ICB). All the variables are as defined in Table 1.Tobit specifications are used when the dependent variable is E, S or ES disclosure scores (Equation (1)). OLS regressions are used when the dependent variable is ROS. All variables are as defined in Table 1. The t-statistics using standard errors clustered by firm and year are in parenthesis. *, **, *** indicates significance at 10%, 5% and 1% levels respectively.

academic research, this finding is consistent with Renneboog, Horst & Zhang's (2008) analysis which shows that social along with governance screen forms the single largest category for picking stocks by the socially responsible investment (SRI) sector around the world. Our analysis illustrates that this trend may not be limited to the SRI sector alone. It seems that investors in general now place a relatively higher value on firms who are seen to better address their social responsibilities towards their stakeholders, particularly their employees (Bloomberg social disclosure score covers largely the issues related to employees). Theoretical arguments for CSR also focus on employees (Heal, 2005; Siegel, 2009) and 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 in general have become sensitized 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 important stakeholder.

Table 6 shows the results for the test of H3. Consistent with the positive impact of S disclosure on firm value, the long run implied growth rates in residual income are also positively and significantly associated with S and the combined ES disclosures scores, but not with E disclosure scores. Again as we control for actual E and S performance in this analysis, the result implies that disclosure has an impact on the long run implied growth rates beyond that of performance. This result further strengthens our earlier argument that more extensive S disclosures that reflect the firm's strong commitment to employees and other stakeholders generate competitive advantages which investors expect to have a positive impact on the growth rate of the firm's future cash flows.

5. Additional analyses and robustness checks

In our analysis of the impact of disclosure on firm value, it is possible that any observed effect is via the discount rate or the cost of equity capital. Although, we do not have a formal hypothesis regarding the cost of capital effects, given its importance

Table 5
Impact of E/S/ES disclosures on market value.

	Dependent variable		
	Price	Price	Price
Bvps	0.232**	0.265***	0.242**
	(2.21)	(2.85)	(2.37)
Eps	9.449***	9.435***	9.415***
	(5.60)	(5.66)	(5.59)
E	0.018		
	(1.27)		
A4E	−0.008		
	(−1.38)		
S		0.026**	
		(2.06)	
A4S		0.018***	
		(2.67)	
ES			0.013**
			(2.59)
A4ES			0.002
			(1.27)
ROA	5.649***	6.184***	5.996***
	(3.18)	(3.00)	(3.06)
Rdps	3.478*	3.436*	3.406*
	(1.80)	(1.88)	(1.77)
Size_sales	0.094	−0.196**	−0.063
	(1.01)	(−1.99)	(−0.75)
Leverage	0.937	0.849	0.969
	(1.57)	(1.31)	(1.56)
Industry Effects	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes
Intercept	2.470**	3.940***	3.383***
	(2.29)	(2.84)	(2.71)
R-squared	0.693	0.702	0.695
F	34.94***	31.94***	33.10***

Table 5 reports the results of testing Hypothesis 2, relating to the effect of disclosure on stock price. The industry classification is based on FTSE/DJ single-digit Industry Classification Benchmark (ICB). All variables are as defined in Table 1. 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.

in the disclosure literature (Botosan, 2006; Dhaliwal et al., 2011; Verrecchia, 2001) we run regressions similar to Equation (5), but with the implied cost of capital ($\mathrm{re_{it}}$) estimate as the dependent variable. The specific form of the regression we run is:

$$\mathrm{re_{it}} = \beta_0 + \beta_1 \mathrm{Disclosure_{it}} + \beta_2 \mathrm{RDPS_{it}} + \beta_3 \mathrm{ROA_{it}} + \beta_4 \mathrm{SIZE_{it}} + \beta_5 \mathrm{Leverage_{it}} + \sum_{j=1}^{j=9} \beta_{6j} \mathrm{IND_{jit}} + \sum_{j=2006}^{j=2009} \beta_{7j} \mathrm{year_{jit}} + \varepsilon_{it} \tag{6}$$

where, $\mathrm{re_{it}}$ is the cost of equity capital. In contrast to the results on the growth rate, we find no significant relationship between the disclosure scores and the cost of equity capital (hence, in the interest of brevity, we do not report these).

In our analysis as described earlier, to arrive at the implied growth rate of residual income, we assumed the cost of capital was the same for all the firms within the same industry. As a robustness check, we use each firm's price to earnings growth (PEG) estimated using its two year ahead ($\mathrm{eps_2}$) and one year ahead analyst forecast ($\mathrm{eps_1}$) of earnings and current prices ($\mathrm{P_0}$), $rePEG = \sqrt{(eps_2 - eps_1)/P_0}$ as an alternative measure of its cost of equity capital (Botosan & Plumlee, 2005; Easton, 2004). Our conclusions remain unchanged.

We also conduct further tests on the link between profitability and E and S disclosure by considering ROE, which although not widely used in the non-financial disclosure literature, is commonly used in the CSR performance literature (see e.g. Callan & Thomas, 2009; Hart & Ahuja, 1996). We also use ROA as an additional measure (see e.g. Brammer & Pavelin, 2006, 2008; Cormier & Magnan, 2003). Consistent with prior evidence, we do not find a link between either of the measures and E and S disclosures.

6. Discussion and conclusion

In this paper we examine the link between E and S disclosures of a firm and its profitability and market value. The profitability analysis reveals a positive link between lagged profitability and current S disclosures. It appears that firms with some track record of profitability have the ability and the willingness to invest in stakeholder engagement practices as evidenced by higher and objective S disclosures. We however find no evidence of reverse causality, i.e. one running from

Table 6
Impact of E/S/ES disclosures on growth rates.

	Dependent variable		
	Grate	Grate	Grate
E	0.001		
	(0.74)		
A4E	0.000		
	(0.25)		
S		0.002***	
		(3.56)	
A4S		−0.000	
		(−1.24)	
ES			0.001*
			(1.88)
A4ES			−0.000
			(−1.08)
Rdps	0.0308	0.0324	0.0335
	(1.16)	(1.28)	(1.27)
ROA	−0.075***	−0.070***	−0.076**
	(−2.81)	(−2.62)	(−2.56)
Size_sales	−0.005**	−0.007***	−0.007***
	(−2.38)	(−3.15)	(−2.78)
Leverage	0.007	0.013	0.010
	(0.22)	(0.40)	(0.34)
Intercept	0.138***	0.122***	0.140***
	(6.20)	(5.12)	(6.93)
Industry Effects	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes
R-squared	0.285	0.304	0.298
F	20.26***	18.70***	19.40***

Table 6 Reports the results of testing Hypothesis 3, which relates to the effect of disclosure on the growth rates. g_{it} (grate) is the implied long run growth rate of Residual Income. The industry classification is based on FTSE/DJ single-digit Industry Classification Benchmark (ICB). All variables are as defined in Table 1. 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.

lagged disclosures to profitability. Perhaps it takes a longer time for the effects of a good reputation built up through extensive and objective voluntary disclosures (Armitage & Marston, 2008) to translate into superior profits. As longer time series data become available, future research can revisit this issue.

Our market value analysis reveals that investors also care about S disclosures. On one hand, this finding may be regarded as unique to UK's institutional context given the historical importance of social issues in UK's political economy. Gray et al. (1995) suggest that extensive S disclosures may be an attempt by the organization to gain the 'approval' from the powerful social and political stakeholders in UK's society, which investors as capitalists would also care about.[7] On the other hand, this evidence is also consistent with emerging findings which show that globally investors now care about a firm's social performance (see Marsat & Williams, 2014). Finally, this finding mirrors the value attached to social screens by the global SRI sector (Renneboog, Horst, & Zhang, 2008) and is also consistent with the predictions of scholars (Friedman & Miles, 2001) that mainstream investors would in future care about the social reputations of their investee firms.

Our finding of no link between E disclosures and firm value while perplexing could be attributable to a number of reasons. First, it could be due to the nature of the disclosure score. Many prior studies mostly gauge the reaction to negative environmental news (e.g. Lorraine et al., 2004; Shane and Spicer, 1983). As Bloomberg score covers all types of E disclosures, both positive and negative, the score could be a noisy measure of the firm's underlying environmental performance. Second, prior evidence is usually limited to the environmentally sensitive sectors where environmental performance and its related disclosure would matter to investors as it would have real cash flow implications, in terms of environmental fines, remediation and prevention costs, etc. (e.g. Al-Tuwaijri et al., 2004; Clarkson et al., 2011). Finally, even if objective and extensive E disclosures reflect superior underlying E performance, whether investors care about E disclosures and even E performance across the cross-section of industries remains an open question (given the mixed results on the link, see Aggarwal, 2013 for a recent review). Our findings also suggest that across industries, it is the social performance and its disclosure that matters to investors, as these may help firms reap real economic benefits. Our finding of expected growth rate of cash flows as the driver of the stock prices of high S disclosure firms further supports this last assertion. Overall, these results are consistent with the predictions of both the RBV and the VDT 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.

[7] See Gray et al. (1995) for a comprehensive discussion of the origins, patterns and contents of social disclosures in the UK.

Our study has some limitations as well as future research implications. One limitation of these findings is that they relate to the largest UK companies. Future work could investigate the disclosure practices, their determinants and their economic consequences for smaller firms. This is important as our profitability analysis suggests that any future regulation in this area may have different economic implications for small and large firms. A second possible limitation is that our findings relate to the institutional context in the UK. While some scholars argue that institutional differences like the nature of the reporting regime (e.g. more voluntary versus more rule-based) can lead to varying consequences for disclosures (Cormier & Magnan, 2007; Leuz & Verrecchia, 2000), others argue that as capital markets integrate across countries '*corporate disclosure strategies seem to be determined in a similar way, irrespective of a given country's socio-cultural environment*' (Cormier & Magnan, 2003, p. 58). While E and S disclosures are largely voluntary around the world, it would be interesting to test the results of this study in diverse institutional settings. Finally, while our findings shed some light on the importance of S disclosures, future research can verify whether these results are unique to UK or whether globally corporations and their investors now care about S disclosures.

Appendix 1. E and S indicators with Bloomberg fields

Environmental	
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 Litres)	WATER_PER_UNIT_OF_PROD
% Water Recycled	PCT_WATER_RECYCLED
Discharges to Water	DISCHARGE_TO_WATER
Waste Water (Th Cubic Metres)	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 Litres)	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

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