Do Financial Markets Care About Social And Environmental Disclosure? 
Further Evidence And Exploration From The Uk [11, 12]

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ABSTRACT

Financial markets are increasingly powerful at the global level. That power can manifest itself in many ways – including in the influence that financial markets can have upon environmental degradation and social injustice. Furthermore, and equally important in the present context, markets impose limitations on the ability of quoted companies to undertake activities which might be seen as experimental and financially fragile despite their being seen as socially and environmentally responsible. The power of markets does not seem to be balanced by an equivalent responsibility. Social and environmental disclosure may be one possible way in which markets may be re-educated towards less un-sustainable modes of behaviour. It is in this context that this paper seeks to explore whether stock market participants in the UK exhibit any discernible reaction to the social and environmental disclosures made by the largest 100 companies selected from the Times 1000 on the basis of turnover. A series of tests are undertaken to explore any of the ways in which share price behaviour might reflect large company disclosures about their environmental and other social activities. Whilst no relationship of any kind is found in the more straightforward tests of association, 'coding' of the data does produce convincing evidence that the level of company returns over time is associated with the level of certain types of disclosures over time. This association remains when adjustment is made for size and industry. The paper concludes by exploring explanations for these findings with particular emphasis on the moral case for greater and better quality disclosures and calls for further tests which might explore whether markets have historically impounded and discounted for the predilection to disclose.

1. Introduction

The growing expansion, globalisation and, ultimately, power of financial markets is a matter of increasing concern to many, (see, for example, Schmidheiny and Zorraquin, 1996; Rich, 1994; Korten, 1999; Suranyi, 1999). Not only is there a growing anxiety about the re-distributional effects that such markets encourage but there is equal concern that they also act to limit the discretion and range of options available to the management of quoted companies. In a short-term economic sense this may not be important but if companies must be amongst the major institutions through which environmental responsibility, social justice and, eventually, sustainability are to be delivered[4], then companies need the ability to experiment, take longer perspectives and undertake actions of which financial markets may disapprove (Schmidheiny, 1992; Hawken, 1993; Hawken et al., 1999).[5]

Financial markets are variously seen as offering the biggest single impediment or the greatest possible opportunity for international capitalism to re-invent itself in a new form which is compatible with the exigencies of sustainability. In the absence of an apparent will to closely regulate financial markets, it must fail to stimulate, cajole and persuade to encourage markets to act in a manner less incompatible with the social and environmental aims of sustainability. A potentially major factor in achieving this ambitious re-direction must inevitably be information and, in particular, information about organisations' social and environmental activities. This is a role currently fulfilled – albeit inadequately[6] – by corporate social and environmental disclosure through, mainly, the corporate annual report, (see, for example, Mueller et al., 1994)[7].

Such disclosure, occurring as it does within the annual report, might well be assumed to have shareholders as its primary target audience – and as hinted at above, they may well be the most important audience for this material, (see, for example, Neu et al., 1998; Milne and Patton, 2002). However, in a recent review of the extant literature concerning the relationship(s) between corporate social responsibility, social reporting and the stock market, Richardson et al. (1999) concluded that research in the field is still relatively inconclusive and largely under-specified. Even without examining the ontological and epistemological assumptions of the literature, there were sufficient problems of definition, measurement and under-specification of models, the authors argued, to require continuing debate and examination of the issues. (See also Ullmann, 1985).

Although social and environmental disclosure may not yet be an obviously substantive part of mainstream corporate activity, it is a growing area of concern to all parties and, more especially, has both significant instrumental potential (see, for example, Lehman, 1999) and a strong moral force and potential (see, for example, Owen et al., 1997; Mathews, 1995). Given the increasing power and importance of financial markets and their intrinsic indifference to non-financial matters, social and environmental disclosure becomes a very important link between the financial hyper-reality and the lifeworld (Thielemann, 2000; Mackintosh et al., 2000)[8]. It is in this context that the present study takes its moment.[9]

The present paper seeks to contribute to just one aspect of this continuing debate – that of the relationship between stock market...
behaviour and corporate social and environmental disclosure. More particularly, this paper seeks to present evidence on the relationship(s), if any, between the data reported by large UK companies on their social and environmental activities and the share price returns of those companies. The evidence presented is derived from both cross-sectional and nine years' longitudinal data and seeks to control for the two factors most typically associated with social and environmental disclosure - company size and industry sector (see, for example, Gray et al., 2001).

The paper is structured as follows. The next section explores the motivation for the study (thereby, seeking to broaden the debate about the importance of both financial markets and social and environmental disclosure) and then reviews the, surprisingly sparse, prior literature and draws from here the motivation for the tests contained in this paper. Section 3 outlines the disclosure and share return data employed in the tests. Section 4 describes the tests that are to be undertaken, delineates the models on which the tests are based and explains why second tranche of tests based upon the "coding" of the data was undertaken. Section 5 provides the detailed results of the tests and includes a non-technical interpretation of the results. The final section summarises the key findings, discusses their implications and looks forward to future research issues in this area.

2. Financial Markets and Social and Environmental Disclosure

Research into corporate social and environmental disclosure can be thought of having two principal branches. The first branch of the research has sought to examine how social and environmental disclosure can be seen as reflecting and discharging the responsibilities and subsequent accountabilities of the organisation. This research has taken a societal point of view and has been motivated (primarily) by democratic concerns about rights to information and the means by which organisational behaviour might be controlled by society (see, for example, Medawar, 1976; Gray et al., 1988; 1991 and 1996; Lehman, 1999; 2001; 2002; Cooper et al., 2003). The second branch of research into social and environmental disclosure has been rather more managerialist in orientation and sought to explore (i) how the company uses such disclosure to manage its stakeholders and (ii) how such disclosure might be used to secure the legitimacy of, either, the individual corporation or, more broadly, corporate capitalism itself. (See Cooper, 1988; Arnold, 1990; Arnold and Hammond, 1994; Gray et al., 1995a; Deegan, 2002; for a discussion of these issues).

However, of more direct relevance in the present context, social and environmental accounting research has not entirely ignored the traditional financial participant and, especially in more recent years, has sought to explore if financial markets might be interested in social and environmental disclosures – and if so, why? Researchers have sought to establish whether investors find social and environmental disclosures decision-useful. This research, in keeping with much research into financial reporting theory (see, for example, Belkaoui, 1986), has employed a variety of methods to investigate the actions, attitudes and behaviours of the individual investor (see especially Epstein and Friedman, 1994; Chan and Milne, 1999; Milne and Chan, 1999) as well as the more familiar explorations of aggregate financial market response to such disclosures. There are several factors that commend this research to our attention.

Despite fairly convincing evidence that investors often exhibit a more than passing interest in social and environmental disclosures (see, for example, Benjamin and Stanga, 1977; Chenall and Juchau, 1977; Firth, 1978; 1979; 1984; Epstein and Freedman, 1994), it is still traditional to assume that investors are only interested in maximising their risk-adjusted returns from investment, (see, for example, Benston, 1982; Skogsvik, 1998; but see also Rivoli, 1995). Under such an assumption, there is no immediate or obvious reason for shareholders to have any interest in the social and/or environmental aspects of their investment – except insofar as those aspects represent potential risk to the investment or whose disclosure can be taken as signals about the competence of management (Neu et al., 1998; Hufsted, 2000; Orlitzky and Benjamin, 2001; Milne and Patten, 2002). And yet, governments continue to increase the requirements governing the disclosure of social and environmental data in corporate reports whilst corporate management, themselves, continue to produce voluntary disclosures in the annual report. Whilst a commentator wedded to a 'free market' perspective might well find the apparently irrational imposition of additional information costs by the government on the corporation and its shareholders unsurprising, they would probably be more concerned by the potential wastefulness of a corporate management engaging in voluntarily producing non-price sensitive data.

This potential 'wastefulness' by corporate management would fly directly in the face of "conventional" market wisdom (and, see, for example, Friedman's (1962; 1970) famous comments on the matter) unless it could be shown that such data has price relevance. Could such data represent signals to the investor? Could the signal suggest that, for example, the company is aware of potential social or environmental costs and has taken steps to manage them? Could it be that it is aware of the actions of pressure groups and has responded to avoid potential problems? Perhaps it signals awareness of growing liabilities upon which the company is acting accordingly or suggests that the company is managing and exploiting its high level of reputation with niche consumer groups.

As we shall see, although investors are apparently exhibiting an increasing demand for social and environmental disclosure, there is no evidence (as far as we are aware) of proven links between the price sensitivity of the social and environmental data and the substantial changes in economic circumstances that these data could be signalling. Thus it remains an open question as to whether or not corporate management are exhibiting wastefulness in undertaking voluntary social and environmental disclosures or successfully signalling their competence to the market. In essence, research has not advanced us much beyond Ullmann's (1985) often-repeated observation that it "pays to be good but not too good."

The reasons it pays the company to be good(ish) are purely financial in nature. As the apparent general awareness and concern in society for such matters as environmental degradation, habitat destruction, global climate change, human rights, and stakeholder involvement, continues to increase (see, for example, Brown and Flavin, 1999), it certainly seems likely that the number of potential areas in which social or environmental activity can have relatively direct financial consequences must increase (see, for example, Preston and O'Bannon, 1997; and Griffin and Mahon, 1997; for reviews). These consequences can be of a cost-saving nature (see, for example, McMillan, 1996); cost or liability avoidance (see, for example, Gunthorpe, 1997; Hughes, 2000); revenue-generating (see, for example, McIntosh et al., 1998) or even simple signals of best-in-class management practices (see, for example, Stone, 2000). In such a climate, social and environmental issues continue to rise as areas of potential risk requiring careful management by prudent organisations.

The foregoing offers an a priori argument for why social and environmental data may have potential impact on shareholders' decisions as to whether or not to buy, hold or sell shares. But, the crucial thing is that such an analysis presupposes that investors are only interested in the financial aspects of their investment, (see also Richardson et al., 1999). And this, by default, produces the normative moment - that is at the heart of most accounting and finance - that suggests (implicitly) that investors should only think of financial...
aspects of their investment decisions.

There is no evidence, as far as we are aware, that all investors are exclusively interested in a purely financial appraisal of their investments. Indeed, the very significant growth in ethical investment funds (see, for example, D’Antonio et al., 2000) probably suggests quite the reverse. Indeed, such evidence opens the door to the possible suggestion that investors become less obsessed by that financial return when the (social, environmental, ethical) implications of the investment are made apparent. Therefore, as Belkaoui (1976) argues, there is no a priori reason why we should assume that all investments are always treated as purely economic events. Consequently, social and environmental disclosures may well offer an important source of direct input to these ‘ethical’ investors’ decisions (Owen, 1990 and see also Miles et al., 2002).

There is a further normative element to this, however. Unless one takes the most primitive of ethical, economic and social reasoning, it is probably impossible to argue that the only morality which attaches to the investor is to make the most economically effective investment – as measured by personal financial returns. (See Jacobson, 1991; Thielemann, 2000; Collison and Frankfurter, 2000). To do so takes us into the old chestnut that ‘rich means good’, ‘richer means better’, and any detrimental social and environmental effects arising from the use to which the investment is put and from which the returns are derived are of no moral concern to the investor. (The typical right-wing, ‘free-market’ view would be likely to suggest that this is a fault of the government to properly regulate the system and/or the fault of those who suffer the detriment for not exercising their economic choice in an appropriate manner). Consequently, social and environmental disclosure can actually be seen as an educative process whose purpose is either to explain the social and environmental complexities underlying the investment or to show the investor what moral choices are being made.

Finally, social and environmental disclosure may have to play a crucial role in moves towards sustainability (Leggett, 1996; Suranyi, 1999; Gray and Bebbington, 2000; and see also Case, 1999). That is, there is increasing recognition (see, for example, Schmidheiny and Zorraquin, 1996) that moves towards sustainability (or, more realistically, moves away from un-sustainability) cannot be achieved if financial markets remain as rapacious, self-serving and short-termist as there are currently (Tinker and Gray, 2003). There would appear to be an absence of any international political will – or, perhaps international political ability (but see Bailey et al., 1994a; 1994b; Kolk et al., 1999) – to control financial markets to a much greater degree than is currently the case. As a consequence, even the very best run, well-intentioned and intelligently informed companies - if quoted – currently has very little room for discretionary actions of a socially or environmentally responsible nature. Any major activity by the company management which investors cannot see as being of a relatively direct and foreseeable economic benefit to the organisation is, a priori, likely to be penalised by either the selling of shares or of motions to remove this (enlightened) corporate management. The sorts of activities – and, indeed, experiments – that must be explored if we are to discover if ‘sustainable capitalism’ is a possibility or a pipe-dream are unlikely to enlourm themselves immediately to financial markets. (See Cordeiro and Sarkis, 1997; Leggett, 1996)

Consequently, financial markets need to be ‘educated’ (see, for example, Schmidheiny and Zorraquin, 1996) about the social and environmental challenges that sustainability presents to each and every company. Although social and environmental disclosure is, as yet, not delivering this quality of educative disclosure, (see, for example, Gray, 2000) it seems inevitable that social and environmental disclosure must play a major part in seeking out the possibilities of transformation that may exist in financial markets.

There has been a considerable body of research over the years into such matters as the social and environmental performance of companies and financial indicators including share price response, (for relatively recent reviews of this literature see, for example, Richardson et al., 1999; Gray et al., 2001; Orlitsky and Benjaim, 2001; Wagner, 2001; Tomos, 2002; Patten, 2002; Lorraine et al., 2004). However, we have been unable to discover more than a relatively few studies which have directly examined the relationship between social and environmental disclosure and financial markets.

That is, whilst a range of studies have examined share price responses to releases of information about the company, typically EPA or CER,[17] information releases, these studies have treated the information as a direct analogue for the underlying (social or environmental) activity and investigated how investors might react to changes in social or environmental behaviour. (See, for example, Jaggi and Freedman, 1992; Pava and Krausz, 1996; Edwards, 1998; and see also Wagner, 2001 for a comprehensive summary and Lorraine et al., 2004; for an example of a UK based enquiry).

Of more direct interest to us here, is to look at the reaction to the disclosure process itself and, in particular, reaction to those self-disclosures made by the individual company. What we find, as so often, is that the results – which are predominantly from the USA - are inconclusive and, probably, not generalisable beyond the US. Belkaoui (1976) was explicitly looking for, what he called, the "ethical investor" effect. The disclosure he examined was that of environmental fines. He claims to have found the ethical investor effect and reports a positive and significant relationship between share returns and corporate disclosure. Frankle and Anderson (1978) challenge Belkaoui’s reasoning and research design and, reworking Belkaoui’s data, report a negative relationship between disclosure and share price performance. Anderson and Franklin (1980) went on to undertake their own analysis and report the outcome as inconclusive. (Although there did appear to be some positive relationship between share returns and whether a company was disclosing or non-disclosing, the results were not statistically significant). Ingram (1978) identified that there are different areas of disclosure and whilst he reports there is no relationship between share returns and disclosure he does conclude that there may be a positive relationship in the case of environmental disclosure. Finally, Jaggi and Freeman (1992) conclude that environmental disclosure in heavily polluting companies does have information content. All of these are US studies and the results are clearly inconclusive, (see also Richardson et al., 1999). There has been little further direct investigation of this area (as far as we are aware) – presumably because the US Ernst and Ernst (1976 et seq) database of social disclosures was discontinued after 1978 thus making data access a problem. Consequently, it seems apposite not only to try and look at more recent data but also to undertake a test in a country, the UK, where the matter has not previously been investigated systematically.

The tests undertaken (outlined in the "Method" section) are directly influenced by the prior work in the field broadly and by the paucity of prior work which specifically examines the relationship between disclosure and share price performance. That is, we first test for the existence of any obvious relationship between social and environmental disclosures in the annual report of companies and the share price performance of those companies in order to confirm (or reboot) expectations that any relationship is likely to be elusive, slight and, at best, inconclusive. But we then develop the testing as a direct result of the guidance which we infer from the prior literature. That is, first, throughout the testing we explicitly recognise difference between (i) mandatory and voluntary disclosure and (ii) between disclosures concerning different subjects – most obviously social and environmental. Second, we take explicit cognisance of the likelihood that, although a relationship between social/environmental disclosure and financial market participant behaviour is likely, it is an under-theorised relationship and is likely to be (currently at least) amongst the less significant influences upon the movement in share prices.
We thus take the Gray et al. (2001) arguments concerning the improved likelihood of any relationship being more likely to reveal itself over a period of time – rather than at single points in time - and we consequently undertake both cross-sectional and longitudinal analyses of the data. Third, relatively and more substantively, we are led to hypothesise that social and environmental disclosures and share price performance do not articulate functionally and that a simple causal relationship is unlikely to obtain. We are led by the literature to conjecture that companies may have predispositions to disclose and it may be this predisposition that bears a relationship with financial market performance. We therefore test this predisposition hypothesis and identify results which are in keeping with it.

3. Data

The tests in this study are based on data from the UK’s "Top 100" companies (chosen from the Times 1000) over a 10-year period between 1988 and 1997. The social and environmental disclosure data are stored in the Centre for Social and Environmental Accounting Research (CSEAR) database of UK social and environmental disclosure by the top 100 UK companies. This database, in keeping with the majority of prior research which has examined such disclosure (see, for example, Gray et al., 1995a; 1996), concentrates on the largest companies which tend to provide the most extensive and innovative disclosure. Furthermore, the database contains disclosures from the top companies from 1988 to (at the time of the current tests) 1997. It, thereby, presents the opportunity to undertake both cross-sectional and longitudinal tests. In addition, the database differentiates between areas of disclosure (that is, between, for example, environmental, community, employee and customer related disclosure) as well as allowing distinctions to be drawn between mandatory and voluntary disclosures. The prior literature (but see also Gray et al., 2001) has hinted that (i) environmental disclosures appear to be the most likely to be of interest to financial markets; and (ii) that discretionary (i.e. voluntary) disclosure is far the more likely to represent a signal to markets than those disclosures which are required of all firms. Consequently, it is upon: total (i.e. both mandated and voluntary) disclosure (CSRTOT); and two of its components: total voluntary disclosure (VOLTOT); and total environmental disclosure (ENVTOT) ; that we concentrate in what follows. The study investigates whether there is a statistical relationship between these variables and share returns. The disclosure variables represent the number of pages in a company’s annual report allotted to social and environmental issues and were constructed using content analysis.

As only annual reports from the "Top 100" companies each year are featured in the CSEAR database, the initial sample considered in the present paper is restricted to 168 firms (i) as new companies with large market capitalisation were promoted into the list because of changes in valuation from one year to the next and (ii) as a number of companies disappeared because of merger, takeover or a fall in share value. Three further criteria were adopted when determining the final sample. First, companies had to be present in the database for at least three of the nine years covered in order to perform some of the longitudinal tests. In addition, the database differentiates between areas of disclosure (that is, between, for example, environmental, community, employee and customer related disclosure) as well as allowing distinctions to be drawn between mandatory and voluntary disclosures. The prior literature (but see also Gray et al., 2001) has hinted that (i) environmental disclosures appear to be the most likely to be of interest to financial markets; and (ii) that discretionary (i.e. voluntary) disclosure is far the more likely to represent a signal to markets than those disclosures which are required of all firms. Consequently, it is upon: total (i.e. both mandated and voluntary) disclosure (CSRTOT); and two of its components: total voluntary disclosure (VOLTOT); and total environmental disclosure (ENVTOT) ; that we concentrate in what follows. The study investigates whether there is a statistical relationship between these variables and share returns. The disclosure variables represent the number of pages in a company’s annual report allotted to social and environmental issues and were constructed using content analysis.

The final sample consisted of 660 (CSRTOT, VOLTOT and ENVTOT) instances of disclosures for (coincidentally) 100 firms over the 9-year period. Some 41 of the companies had 9 observations in the sample, 10 had 8 observations, 6 had 7 observations and the remaining 43 had 6 or fewer observations respectively in the final analysis. Descriptive details for the sample are provided in Table 1.

Table 1: Descriptive Statistics for the Sample

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>No. of Firms</th>
<th>No. of Obs</th>
<th>TURN-OVER Mean</th>
<th>VOLTOT Mean</th>
<th>ENVTOT Mean</th>
<th>CSRTOT Mean</th>
<th>RETURN Mean</th>
<th>RETURN Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>114</td>
<td>4701</td>
<td>1.75</td>
<td>0.56</td>
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<td>0.064</td>
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<tr>
<td>2</td>
<td>4</td>
<td>30</td>
<td>1973</td>
<td>1.08</td>
<td>0.66</td>
<td>4.97</td>
<td>0.042</td>
<td>0.540</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>33</td>
<td>3410</td>
<td>1.81</td>
<td>0.79</td>
<td>5.56</td>
<td>0.038</td>
<td>0.338</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>66</td>
<td>4837</td>
<td>1.54</td>
<td>0.55</td>
<td>6.14</td>
<td>0.080</td>
<td>0.255</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>59</td>
<td>2289</td>
<td>1.28</td>
<td>0.67</td>
<td>5.74</td>
<td>0.019</td>
<td>0.264</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>59</td>
<td>13813</td>
<td>2.14</td>
<td>1.45</td>
<td>6.47</td>
<td>0.086</td>
<td>0.205</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>47</td>
<td>3514</td>
<td>1.17</td>
<td>0.57</td>
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</tr>
<tr>
<td>8</td>
<td>17</td>
<td>122</td>
<td>4672</td>
<td>1.93</td>
<td>0.58</td>
<td>5.96</td>
<td>0.042</td>
<td>0.321</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
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<td>7377</td>
<td>2.81</td>
<td>1.96</td>
<td>8.09</td>
<td>0.068</td>
<td>0.264</td>
</tr>
<tr>
<td>10</td>
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<td>13</td>
<td>2935</td>
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<td>1.13</td>
<td>7.73</td>
<td>0.120</td>
<td>0.156</td>
</tr>
<tr>
<td>11</td>
<td>7</td>
<td>35</td>
<td>2940</td>
<td>1.61</td>
<td>0.64</td>
<td>4.70</td>
<td>-0.097</td>
<td>0.390</td>
</tr>
</tbody>
</table>
A visual inspection of this table reveals that the 100 companies in the sample are not evenly distributed between the 14 sectors analysed; two sectors have 17 firms while three sectors have only 2 constituent companies. The size of company in each sector also varies widely. It ranges from a low of £1.973m in the Textile industry to a high of £13.813m in the Chemicals, Oil & Gas sector while the mean turnover figure was £4.860m for all firms. The typical company in the sample included 5.86 pages of corporate social reporting in its annual report of which 1.67 pages related to voluntary data that were not required to be published under current legislation; most disclosures therefore related to mandatory matters which companies are obliged to publish. This fairly low level of disclosure is common across all sectors although firms in Pharmaceuticals and General Manufacturing had the highest average CSRTOT (8.08 and 7.73 pages respectively) among the groups studied. Environmental disclosure is fairly small for the sample companies at 0.75 pages and only a few sectors (Chemicals, Oil and Gas; Pharmaceuticals; General Manufacture; and Extractive) have average disclosure levels of more than 1.00 page devoted to this topic in their annual reports. Finally, average annual returns for the sample firms varied from a low of –0.097 for companies in the Contracting and Building sector to a high of 0.162 for companies in the Aerospace and Defence industry, (although note the small sample size for this last sector). The tremendous variety in stock market performance for firms in the different sectors is confirmed by an analysis of the standard deviation figures. Returns were particularly volatile in the Textile sector (STDEV = 0.540) but remarkably stable for shares in the General Manufacturing industry (STDEV = 0.156). It is worthy of note that the poor (financial) performance of contracting and building companies in the sample was associated with relatively high levels of risk (STDEV = 0.390) suggesting that shareholders in these firms fared badly (in traditional financial terms) for the particular years which are covered in the analysis.

Overall, this UK data set presents a new opportunity to examine the relationship between corporate social and environmental disclosures and share returns (in both cross sectional and longitudinal contexts) and should provide a useful comparison with the US-based work in the area. To date, the absence of a non-US database is probably one of the main reasons why there has been no substantial work on this topic in the UK.

4. Method

Five statistical tests are conducted to determine whether a link exists between corporate social and environmental disclosures and share returns. These tests were conducted in three series. The first series comprised tests of the un-transformed data as an exploration of the obvious hypotheses concerning the likely associations. The second series of tests involved grouped data with the companies categorised into groupings based on the returns (i.e. high, medium and low) and the disclosure (e.g. small, medium or large). This grouping indicated a test of whether any non-linear relationship existed between the variables being studied; two sectors have 17 firms while three sectors have only 2 constituent companies. The size of company in each sector also varies widely. It ranges from a low of £1.973m in the Textile industry to a high of £13.813m in the Chemicals, Oil & Gas sector while the mean turnover figure was £4.860m for all firms. The typical company in the sample included 5.86 pages of corporate social reporting in its annual report of which 1.67 pages related to voluntary data that were not required to be published under current legislation; most disclosures therefore related to mandatory matters which companies are obliged to publish. This fairly low level of disclosure is common across all sectors although firms in Pharmaceuticals and General Manufacturing had the highest average CSRTOT (8.08 and 7.73 pages respectively) among the groups studied. Environmental disclosure is fairly small for the sample companies at 0.75 pages and only a few sectors (Chemicals, Oil and Gas; Pharmaceuticals; General Manufacture; and Extractive) have average disclosure levels of more than 1.00 page devoted to this topic in their annual reports. Finally, average annual returns for the sample firms varied from a low of –0.097 for companies in the Contracting and Building sector to a high of 0.162 for companies in the Aerospace and Defence industry, (although note the small sample size for this last sector). The tremendous variety in stock market performance for firms in the different sectors is confirmed by an analysis of the standard deviation figures. Returns were particularly volatile in the Textile sector (STDEV = 0.540) but remarkably stable for shares in the General Manufacturing industry (STDEV = 0.156). It is worthy of note that the poor (financial) performance of contracting and building companies in the sample was associated with relatively high levels of risk (STDEV = 0.390) suggesting that shareholders in these firms fared badly (in traditional financial terms) for the particular years which are covered in the analysis.

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Five statistical tests are conducted to determine whether a link exists between corporate social and environmental disclosures and share returns. These tests were conducted in three series. The first series comprised tests of the un-transformed data as an exploration of the obvious hypotheses concerning the likely associations. The second series of tests involved grouped data with the companies categorised into groupings based on the returns (i.e. high, medium and low) and the disclosure (e.g. small, medium or large). This grouping indicated a test of whether any non-linear relationship existed between the variables being studied.

First, Pearson Correlation co-efficients are calculated which examine the degree of linear relationship between the variables being studied. The correlations are estimated between returns and each of CSRTOT (Total Social and Environmental Disclosure), VOLTOT (Total Voluntary – as opposed to Mandatory - Disclosure) and ENVTOT (Total Environmental Disclosure) across the whole sample, for the different sectors and for every year from 1989 to 1997.

Second, the analysis is extended by determining whether a non-linear relationship exists between social and environmental disclosures and share returns. Specifically, returns are split into three categories – low, medium and high. Where the share return in the year is less than –0.015 the company is placed in the “low” category, if the return is between –0.015 and 0.015 it is put in the medium category while if the return is greater than 0.015, it is assigned to the high category. These cut-off points were chosen to ensure that the number of observations in each category was large enough to facilitate statistical testing. They were also associated with breaks in the share return distributions based on a visual inspection of the data set. Each of CSRTOT, VOLTOT and ENVTOT disclosures were also grouped into three categories – small, medium and large – depending on the numbers of pages which were devoted to these issues in the corporate report. For CSRTOT, the small category included those firms with up to 4.00 pages of social and environmental information in their annual reports, the medium category included those companies with between 4.0 and 7.2 pages of social and environmental disclosures in the annual reports and the large category included firms with more than 7.2 pages of such disclosures in their annual report.

The cut-off points for the voluntary disclosures were different since such information only represented a small fraction of the total corporate social disclosures provided by companies. In particular, if less than 0.6 of a page in the financial statements was devoted to VOLTOT, the disclosure was categorised as “small”, if between 0.6 and 2.08 pages were devoted to VOLTOT, the disclosure was classified as "medium" and if more than 2.08 pages were devoted to VOLTOT, the disclosure was labelled "large". Finally, the environmental disclosures were split into three categories based on another set of cut-off points. If less than 0.10 of a page was given over to ENVTOT matters, the disclosure was termed "small", if between 0.10 and 1.00 pages contained ENVTOT information, the disclosure was called "medium" and if more than 1.00 page of the annual report dealt with ENVTOT issues, the disclosure was labelled "large". Other cut-off points could have been selected but a graph of each data series suggested that these points highlighted natural breaks which distinguished between different amounts of firms' disclosures.

With the three categories of disclosure – small, medium and large – a chi-square test of association was conducted with the different share return groupings - low, medium and high –:
where $O_{nm}$ is the observed frequency for row $n$ and column $m$ and $E_{nm}$ is the expected frequency for row $n$ and column $m$, based on the null hypothesis of no association. The test is repeated for the three disclosure types – CSRTOT, VOLTOT and ENVTOT and the null hypothesis of no association examined. The strength of this test is that non-linear as well as linear relationships between variables can be uncovered if they are present in the data.

Third, a General Linear Model was fitted to the share return data to investigate whether interactions between different types of disclosures (CSRTOT, VOLTOT and ENVTOT) either as main effects or as interactions with years in conjunction with size and other selected variables can explain returns. In particular, the following equation is estimated:

$$
R_{ij} = \phi + \beta_1 + \lambda X_{ij} + \gamma Y_{ij} + \varepsilon_{ij} + \mu S_{it} + (\theta q)_{ij} X_{ij} + (\theta g)_{ij} Y_{ij} + (\theta l)_{ij} Z_{ij} + (\theta m)_{ij} + e_{ij}
$$

Where $j$ is a constant term, $q$ is a dummy variable for each year, $X_{ij}$ is CSRTOT. $Y_{ij}$ is VOLTOT, $Z_{ij}$ is ENVTOT. $S_{it}$ is the natural log of the turnover variable $S_{it}$. $l$, $g$ and $m$ are regression coefficients, $(\theta q)_{ij}$, $(\theta g)_{ij}$, $(\theta q)_{ij}$ and $(\theta m)_{ij}$ are the interaction coefficients, and $e_{ij}$ is the error term.

The output from this equation in terms of $F$-statistics and associated $p$-values should provide a comprehensive picture of whether investors appear to respond to certain social and environmental disclosures for different sized companies in several sectors across various time periods by changing their valuation of a company's share price and altering the return earned.

Recognising that the approach to categorising returns and disclosure employed in the chi-squared test (3) above would be likely to swamp any relationships as a consequence of (for example) companies moving from being relatively high to relatively low disclosing and to avoid any bias that might be introduced by dividing the returns for the various companies according to their average over several possibly non-matching periods of years, the fourth and fifth tests were employed on a coded form of the data.

For the fourth test, the returns for each year were ranked, and the fractional rank of each company was expressed as a percentage. The percentage fractional ranks for each company were averaged over the years during which returns were available for that company to produce an average percentage rank. The average percentage ranks were coded into the variable ‘CPTUR’ [35]. This process was also applied to the disclosure variables CSRTOT (Total Social and Environmental Disclosure), VOLTOT (Voluntary Disclosure) to produce coded variables CPCCSR (Coded percentage total disclosure), CPENV (Coded percentage environmental disclosure) and CPVOL (Coded percentage voluntary disclosure). The turnover measure was also classified in this manner to yield CPTUR (Coded percentage turnover), a size variable coded into three levels. The Pearson Correlations between the coded returns and coded social and environmental disclosure were then calculated to see whether a linear relationship existed.

Fifthly, the coded data were then categorised as follows, the lower third was classified as small (1), the middle third was classified as medium (2), and the upper third was classified as large (3). Thus the coded measure places a company in category 1 if, on average, it earned a high return relative to the companies in the sample. The same categorisation process was also applied to the CPCCSR, CPENV and CPVOL and the non-linear relationships were investigated using the chi-squared test. Thus, this final test focuses on whether a company’s predisposition to disclose relatively large volumes of social and environmental information was associated with relatively high share returns.

5. Results

The Pearson Correlation coefficients for the association between annual returns and the amount of corporate social reporting in total and under the two sub-categories are reported in Table 2 [36]. Across the whole dataset, these correlations are positive but very small ranging from a low of 0.021 for CSRTOT to a high of 0.043 for ENVTOT. The test of the null hypothesis that these correlations are equal to zero cannot be rejected at conventional significance levels as the $p$-values are all greater than 0.05. The clear picture which emerges from this scrutiny of the whole dataset therefore is that no linear association exists between share returns and the different social and environmental disclosures being examined [37].

<table>
<thead>
<tr>
<th>Year</th>
<th>CSRTOT (Total Disclosure)</th>
<th>VOLTOT (Voluntary Disclosure)</th>
<th>ENVTOT (Environmental Disclosure)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlation</td>
<td>p-value</td>
<td>Correlation</td>
</tr>
<tr>
<td>1989</td>
<td>-0.185</td>
<td>0.122</td>
<td>-0.115</td>
</tr>
<tr>
<td>1990</td>
<td>0.121</td>
<td>0.306</td>
<td>0.103</td>
</tr>
<tr>
<td>1991</td>
<td>0.041</td>
<td>0.722</td>
<td>0.158</td>
</tr>
<tr>
<td>1992</td>
<td>0.175</td>
<td>0.137</td>
<td>0.105</td>
</tr>
<tr>
<td>1993</td>
<td>-0.032</td>
<td>0.780</td>
<td>0.031</td>
</tr>
<tr>
<td>1994</td>
<td>-0.034</td>
<td>0.771</td>
<td>-0.037</td>
</tr>
<tr>
<td>1995</td>
<td>0.070</td>
<td>0.549</td>
<td>-0.105</td>
</tr>
</tbody>
</table>
Table 4 contains the statistical output from estimating the General Linear Model in Equation [3]. The F-ratios for the main individual effects are shown as well as the two factor interactions with a dummy variable for the year (YEAR). The main conclusion to be drawn from this table is that the returns earned by our sample firms vary over time: the F-ratio for the year variable has a value of 2.347 and a p-value of 0.017. None of the other main effects are significant since the F-ratios are small and the p-values greater than 0.05. Once the interaction terms are studied the year of disclosure for CSRTOT is marginally significant (at the 10 per cent level) but it seems as if the main influence on returns is still year and size. By adding the other disclosure variables and size the adjusted $R^2$ for the model only reaches 10.4 per cent indicating that some 89.6 per cent of the cross-sectional variation in the returns of the firms being studied remain unexplained by the model [40].

Table 4: Output from Fitting a General Linear Model to Explain the Share Return Data

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>F ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.134</td>
<td>1</td>
<td>1.651</td>
<td>0.199</td>
</tr>
<tr>
<td>YEAR</td>
<td>1.526</td>
<td>8</td>
<td>2.347</td>
<td>0.017</td>
</tr>
<tr>
<td>CSRTOT</td>
<td>0.042</td>
<td>1</td>
<td>0.522</td>
<td>0.470</td>
</tr>
<tr>
<td>VOLTOT</td>
<td>0.001</td>
<td>1</td>
<td>0.012</td>
<td>0.912</td>
</tr>
<tr>
<td>ENVTOT</td>
<td>0.028</td>
<td>1</td>
<td>0.343</td>
<td>0.558</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.188</td>
<td>1</td>
<td>2.308</td>
<td>0.129</td>
</tr>
<tr>
<td>YEAR * CSRTOT</td>
<td>1.127</td>
<td>8</td>
<td>1.733</td>
<td>0.088</td>
</tr>
</tbody>
</table>

Note: This table shows the Pearson Correlation Co-efficients between share returns and corporate social and environmental disclosure and two of its components (CSRTOT, VOLTOT and ENVTOT). These correlations are estimated for the whole sample and for each of nine years.
Note: This table presents the results from an analysis of co-variance of share returns on the factor YEAR, on the three covariates total corporate social reporting, voluntary disclosure, environmental disclosure, and on the interactions between YEAR and each of these covariates. The adjusted R-squared value is 10.4 percent.

It will be recalled that a series of "Coded Percentile Rank" (CP) variables were also derived in order to mitigate any potential swamping of the results from the method employed above. (It was anticipated that this approach might also bring us closer to some notion of "predilection to disclose" and whether this predilection exhibited any relationship with a more general measure of the pattern of returns.) Analyses were performed using these coded variables for returns (CPRET), for total disclosure (CPCSR), for voluntary disclosure (CPVOL) and for environmental disclosure (CPENV). In particular, correlation analysis was undertaken between CPRET and the other three coded disclosure variables (i) over the whole period and (ii) in each year, to see if a linear relationship existed. Also Chi-squared tests were undertaken between the same pairs of variables to determine if any non-linear relationship was present. The results of both analyses are summarised in Table 5.

Table 5: An Analysis of the Relationship between Coded Share Returns and the Coded Amount of Corporate Social Disclosure.

Panel A - Pearson Correlation Coefficients

<table>
<thead>
<tr>
<th></th>
<th>CPCSR (Coded Total Disclosure)</th>
<th>CPVOL (Coded Voluntary Disclosure)</th>
<th>CPENV (Coded Environmental Disclosure)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlation</td>
<td>p-value</td>
<td>Correlation</td>
</tr>
<tr>
<td>Total Sample</td>
<td>0.344</td>
<td>0.000</td>
<td>0.198</td>
</tr>
<tr>
<td>1989</td>
<td>0.404</td>
<td>0.000</td>
<td>0.306</td>
</tr>
<tr>
<td>1990</td>
<td>0.406</td>
<td>0.000</td>
<td>0.316</td>
</tr>
<tr>
<td>1991</td>
<td>0.343</td>
<td>0.002</td>
<td>0.231</td>
</tr>
<tr>
<td>1992</td>
<td>0.303</td>
<td>0.009</td>
<td>0.142</td>
</tr>
<tr>
<td>1993</td>
<td>0.327</td>
<td>0.004</td>
<td>0.136</td>
</tr>
<tr>
<td>1994</td>
<td>0.331</td>
<td>0.003</td>
<td>0.159</td>
</tr>
<tr>
<td>1995</td>
<td>0.267</td>
<td>0.012</td>
<td>0.140</td>
</tr>
<tr>
<td>1996</td>
<td>0.312</td>
<td>0.007</td>
<td>0.121</td>
</tr>
<tr>
<td>1997</td>
<td>0.392</td>
<td>0.002</td>
<td>0.236</td>
</tr>
</tbody>
</table>

Panel B - Chi-Squared

<table>
<thead>
<tr>
<th></th>
<th>CPCSR (Coded Total Disclosure)</th>
<th>CPVOL (Coded Voluntary Disclosure)</th>
<th>CPENV (Coded Environmental Disclosure)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chi-Sq.</td>
<td>p-value</td>
<td>Chi-Sq.</td>
</tr>
<tr>
<td>Total Sample</td>
<td>87.532</td>
<td>0.000</td>
<td>41.704</td>
</tr>
<tr>
<td>1989</td>
<td>12.606</td>
<td>0.013</td>
<td>8.859</td>
</tr>
<tr>
<td>1990</td>
<td>12.985</td>
<td>0.011</td>
<td>8.989</td>
</tr>
<tr>
<td>1991</td>
<td>10.913</td>
<td>0.028</td>
<td>6.018</td>
</tr>
<tr>
<td>1992</td>
<td>8.564</td>
<td>0.073</td>
<td>4.690</td>
</tr>
<tr>
<td>1993</td>
<td>10.964</td>
<td>0.027</td>
<td>4.155</td>
</tr>
<tr>
<td>1994</td>
<td>9.463</td>
<td>0.051</td>
<td>4.369</td>
</tr>
<tr>
<td>1995</td>
<td>7.371</td>
<td>0.118</td>
<td>2.805</td>
</tr>
<tr>
<td>1996</td>
<td>8.377</td>
<td>0.079</td>
<td>2.462</td>
</tr>
<tr>
<td>1997</td>
<td>10.165</td>
<td>0.038</td>
<td>4.681</td>
</tr>
</tbody>
</table>

Note: This table shows the relationship between the coded average percentile rank share returns and coded average percentile rank corporate social and environmental disclosures (CPCSR, CPVOL and CPENV).
In Panel A of Table 5, the linear relationship between CPRET and CPCSR, estimated over the whole period using the Pearson correlation coefficient (0.344), is extremely significant; the correlation coefficient is significant; the coefficient from zero, and indicates a positive relationship between the two variables. Therefore, this result suggests that there is a strong tendency for small CPRET firms to disclose small amounts of CPCSR information and for large CPRET firms to publish relatively large quantities of CPCSR disclosures. Similar results emerged from an analysis of CPRET and CPVOL, however the correlation between CPRET and CPENV over the whole period (0.098) was significant to a much less extent. When the linear relationship between CPRET and CPCSR is estimated over each one-year sub-period the correlation coefficient remains positive and statistically significant but varies in value from year to year. By contrast a significant linear relationship between CPRET and CPVOL is encountered in only the first three one-year sub-periods (1988-1991). No significant linear relationship between CPRET and CPENV is evident in any individual year.

The association between categories of returns (in the coded form CPRET) and categories for each of the disclosure variables (in their coded form CPCSR, CPENV, CPVOL) was also examined over the whole period using the chi-squared test (Table 5, Panel B). Again each was found to be extremely significant. The estimated Chi-squared values in Table 5 Panel B of 87.532, 41.704 and 18.490 all had p-values which were less than 0.050.

Turning to the association between categories of coded returns and categories of coded social and environmental disclosures in each one-year sub-period, we note that the association between CPRET and CPCSR is significant at the 5% level in five of the years (1989, 1991, 1993 and 1997). Moreover, in 3 of the other five years the chi-squared co-efficient is significant at the 10% level. The Chi-squared results for CPVOL and CPENV are smaller, indicating that no significant association exists between these variables and the coded returns for the sample firms over and above the linear relationship uncovered in Panel A. Also the relationships tend to become weaker over time suggesting that the volume of disclosures measured by these variables declined in importance throughout the 1990s.

Finally the question of whether the associations identified above between CPRET and each of the disclosure variables (in their coded form CPCSR, CPENV, CPVOL) could safely be attributed to a direct relationship between returns and disclosure, or whether the association was largely due to the relationship between returns and company size, as measured by turnover was examined. To address this issue the partial correlation between CPRET and each of the coded disclosure variables, is estimated while controlling for CPTURN.

The partial correlation results from this analysis are 0.303 for CPCSR (p = 0.000), 0.287 for CPVOL (p=0.000) and –0.012 for CPENV (p=0.768). We therefore conclude that the very significant positive correlations between CPRET and the disclosure variables CPCSR and CPVOL over the whole period are not diminished after allowing for the confounding effect of company size, but that the marginally significant positive correlation between CPRET and the disclosure variable CPENV may be due to multi-collinearity among the variables CPRET, CPTURN, and CPENV.

In summary, returns are related to CSR, provided that we code the data to take account of yearly variation in both of these variables, and this is not due to both variables being related to company size; returns were also related to VOLTOT, in the earlier years of the study; however they were not related to ENVTOT.

This statistical exploration of whether or not there might be a relationship between social and environmental disclosure and stock market behaviour can be usefully re-articulated in non-statistical language.

We examined two data sets. The first data set was the volumes of (selected) social and environmental disclosures derived by content analysis of the annual reports of the largest 100 UK companies for each of 10 years. (For reasons expressed in the text we concentrated upon the values for: total social disclosure; total voluntary (as opposed to mandatory) disclosure; and environmental disclosure). The second dataset was the stock market returns earned by the ordinary shares of those companies in each of those years. Because of the way in which the (annual) returns are calculated, we ended up with only nine years of returns from this data.

This data was then subjected to fairly standard statistical testing. We sought to see if the data sets could be said to: demonstrate linear numerical association (the Pearson Correlation tests); be capable of expression in a simple linear model in such a way that the returns figure could be shown to be directly influenced by the disclosure figure (the regression analysis); demonstrate a non-linear relationship (the chi-square tests); be capable of expression in a more complex general linear model such that returns could be shown to be influenced by the disclosure values, the size of the company, the year of the disclosure and interaction between these; and be indicative of a broad predisposition for those companies with higher returns to engage in higher levels of disclosure. (In this last case the measures are coded into percentage ranks and subject to both Pearson Correlation and chi-square tests).

Each of the first four tests was repeated using monthly returns - as opposed to annual returns – in order to try and overcome the crudeness of using only annual returns (which will be influenced by a great many factors of which annual disclosure is unlikely to be a large part).

A priori it did not seem especially likely that there would be any particularly overwhelming, direct relationship between share returns and social disclosure (as, if there was any such relationship, it would be obscured by many other returns) or that share returns would so obviously and directly "reward" companies for making social and environmental disclosures. The previous literature was largely inconclusive on these matters and, in our judgement, if anything a little optimistic. Although the first four types of tests (on both annual and monthly returns) suggested the existence of some relationships (or probable relationships) in the data, these suggestions were neither strong nor consistent and we are led to conclude that such relationships either do not exist or, if they do exist, they are different from and/or more complex than these tests were able to detect.

However, a far more plausible scenario lies behind the fifth in the series of tests (in which the variables are "coded" into CPRET etc). In crude terms this test does not examine the questions: "does x cause y?" or "is x directly associated with y?"; but rather: "over a period of nine years does an average high (or low) of x seem to be associated with average high (or low) of y?". That is, do companies with high (low) returns over a period of time tend to be the sorts of companies that also produce high (or low) volumes of social and environmental disclosure. The answer to this seems to be a fairly persuasive "yes".

Now each of these results is, like all positivist/statistical studies, dependent upon assumptions, measurements, samples and the like. One tends to overcome these difficulties by a number of means such as applying different (potentially confirmatory) tests; subjecting the data to sensitivity analysis and, for example, maintaining a high confidence level (i.e. ensuring that we are only persuaded by the most persuasive of results). Each of these has been applied to a degree but, in the end, what is persuasive to the mind? To our mind the only assumption that remains bothersome is that about the industry categorisation. Whilst size (clearly an important variable) can relatively easily be controlled for, industry classification is really exceptionally untrustworthy and gets even more muddy when, as did we, the
classifications are lumped together for the purposes of helping the statistics along. This remains a "maintained" hypothesis and it is not clear to what extent the role of industry would confound or clarify these results. It is, like so much else, informed guess work. As a result, analysis based on industry findings were omitted from the current paper.

6. Discussion

The relative paucity of published studies exploring the relationship between social and environmental disclosures and market performance may partly be explained by the absence of data sets (such as the Ernst and Ernst data set), however, our experiences in the first set of tests reported here suggest further reasons for this situation. Most obviously, it is not possible to undertake a conventional events study to seek to establish responsiveness of returns to social and environmental disclosures – not least because of the plethora of other announcements made by companies which are almost certain to have far greater price-sensitivity that the disclosures we have examined. Consequently, we have sought to find ways in which to establish associations between the market returns and the predisposition of companies to undertake social and environmental disclosure. We initially assumed that annual data might well be sufficient to expose this relationship if, indeed, it exists. This proved not to be the case. However, the coding process through which relative performances through time were examined brought us closer to the issue of interest and, indeed, produced some highly significant results. The most important of these was that, over a period of time, total social and environmental disclosure is significantly related to market returns even after adjusting for the size effect.

More formally, the relationships, such as they were, between share price returns and total social and environmental, voluntary social and environmental and environmental disclosures varied from year to year, varied across different forms of disclosure and swung between positive and negative over time (see Table 2). None of these relationships were significant. Equally, within the variables tested here, a dummy variable for the year of analysis and an adjustment for size had far greater influences on returns than did any of the disclosure variables - whose influence was, again, not significant, (Table 4). The key significant results arose as a result of coding the data (for both returns and for disclosure) in terms of relative ranking over time in order to catch the companies' predisposition or predilection to disclose. These results were arresting and we can conclude that companies within this sample with consistently lower returns are likely to have consistently lower levels of total and voluntary social and environmental disclosure in their annual reports. Equally, companies with consistently higher returns are likely to have consistently higher levels of total and voluntary social and environmental disclosure.

The result is maintained when size is adjusted for. These results are apparent for environmental disclosure. Equally, although the relationship for the whole period is strong, the year on year results are insignificant, unstable and seem to get weaker over time. To what extent such results are confounded by the growth in stand-alone environmental reporting over this period is a matter for further enquiry.

What these results highlight is the continuing lack of clear theory to explain the putative relationship between a company's market performance and its social and environmental disclosure decisions. Whilst many theories could be adduced in an attempt to explain why either investors do or do not respond to social and environmental disclosures or why higher disclosing companies are - or are perceived to be - a better economic prospect by financial market participants there are no clear reasons to choose any one which might best explain our findings. On the basis of our first set of tests, we would, indeed, be ambitious to draw any conclusions on the grounds that (a) it is difficult to be certain that an absence of results means an absence of effect and (b) explaining an absence of results inevitably involves a greater degree of speculation. On the evidence of the final tests, however, it seems that we cannot infer that such disclosures are wastefulness on the part of management which are ignored or discounted by the market. Whether we might interpret this as evidence of, for example, a growing social and environmental concern amongst investors, successful signalling by management or just one manifestation of the practices of the better management teams is, at this stage, purely speculation.

Clearly further work is needed and, as a final point, we would wish to stress that the interest in the - apparently still relatively marginal - phenomena of social and environmental disclosure is not motivated by a concern to better explain share price movements and/or to help enhance the returns of diversified investors. In the absence of convincing evidence that social welfare (including sustainability) will be best achieved by the self-serving short-term self-interest of market participants, our concern remains to explore how the astonishingly powerful institutions that are financial markets can be persuaded to act in more socially and environmentally sensitive ways. Such evidence as we have reviewed in the paper and have been able to garner from the analysis suggests that, at the margins at least, this ambition is not entirely hopeless. If further evidence could be gathered to suggest that markets can be persuaded to start to see the social and environmental implications of their financial decisions then a practical case can be added to the moral case that substantive social and environmental disclosure needs to become a regular, significant and regulated part of corporate disclosure. Only then might we see whether the optimism of, for example, Schmidheiny and Zorquian (1996) that financial markets can be a major force for global sustainability has any foundation at all.

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participants.

[1] The discussion here obviously simplifies the relationship between investor, morality and company (see, for example, Reilly and Kyj, 1990; Jackall, 1988) and the notion that we should hope to see any relationship between financial variables and such disclosure does not go unchallenged (see, for example, Hines, 1984; Cooper, 1988).

[2] The research in this paper seeks to appeal to colleagues in both the areas of finance and social and environmental accounting research. The appeal is initiated by: an increasing recognition that financial markets are crucial to our understanding of the social and environmental issues that exercise us; a concern to try and engage our finance colleagues to turn their attention to such issues; to explore, however indirectly, the current rhetoric of the financial institutions about the commensurability of economic and social/environmental goals (an issue whose context is the growth in ethical investment); and, finally, a direct concern to question the amorality on which so much of the finance literature depends.

[3] Selected from the Times 1000 on the basis of turnover.

[4] This follows the recommendation of the editors – a recommendation with which we are glad to comply. Too many papers of a quantitative nature seem, in amongst the delights of the detail, to lose both sight of the essential question they are seeking to address and can lose their less statistically-excited readers.

[5] There are, of course, possible explanations for these phenomena. Not least of these would be a political economy argument that these disclosures are intended to legitimate the system of capitalism rather than to act as legitimating (or equivalent) devices at the level of the individual reader.

[6] More specifically, greater refinement has been brought to the examination of the issues raised by Ullmann (see, for example, Richardson et al., 1999) and, at least from a managerialist standpoint, linkages between certain elements of "socially responsible activity" and financial performance have been identified, (see, for example, Liedtka, 1998; Friedman and Miles, 2001). [14]

[7] This is a potential tautology here in that something which "pays" is more likely to be financial than not. See Gorz (1989) and Thielemann (2000) for particularly good analyses of the colonisation of human values by the economic.

[8] It is, of course impossible to prove a negative and therefore to substantiate that there are few such studies is challenging. A review of papers which have previously reviewed this literature would confirm that there appear to be few such studies. More substantively we would note that (a) there has been no publicly available database of corporate social and environmental disclosures since the termination of the Ernst and Ernst studies in the 1970s (until very recently in the UK - see below) and this would discourage large statistical studies; and (b) as we will show, there are few statistically visible results that emerge from examining disclosure and share price response and papers with no, or inconclusive, results can be difficult to publish, (see, for example, Booth et al., 1987).

[9] Environmental Protection Agency – in this context typically the US EPA.


[11] The choice of the UK "Top 100" companies is driven by the availability of data in the CSEAR database – which is, as far as we can tell, a unique resource. The restriction to the Top 100 in that database is justified by practicability (to make the database manageable) but also because this is the sample that is most comparable with other studies (where size is recognised as a key influential variable in determining disclosure practices) and comprises the organisations most likely to undertake the most extensive and innovative social and environmental disclosure (see, for example, Gray et al., 1995a).

[12] See Gray et al (1995b) for a detailed discussion about how this database was constructed and a comprehensive overview of its contents from 1988 to 1994. More detail about the database and the data itself can be downloaded from the CSEAR website at www.st-andrews.ac.uk/management/csear.

[13] A hint which is also plausible on an a priori basis that environmental activities are the most likely to have direct financial impacts on the company (see, for example, McMillan, 1996).

[14] We would note that all environmental disclosure in the UK is voluntary at the time of writing.

[15] Content analysis is a detailed method, drawn from semiotics, through which textual data can be "objectively" captured for further analysis. See Gray et al., (1995a; 1995b) and the CSEAR website for more detail. Content analysis is used here as a data capture process, the analysis of that data follows in the next section.

[16] The share prices themselves are annual mid-market closing prices and they have all been obtained from Datastream.

[17] That is, of the original 168 firms, 68 had to be removed due to the data requirements explained above.

[18] An increasing number of companies produce stand-alone environmental (and, indeed, social) reports as the period of study progresses. These are excluded from the analysis for a variety of reasons, not least being that the annual report is primarily targeted at shareholders whilst the environmental report is not.

[19] Broadly relevant and substantial work in the UK does exist – notably Toms, 2000; 2002 – but it does not address the same range of issues as we seek here.

[20] The tests reported here are based upon annual share price data. However, as will be seen below, the lack of persuasive results in many of the tests commended to us a replication of these tests using monthly share price data as well. These tests proved to be largely confirmatory. Only the conduct and broad results of these tests are reported here in footnotes at the appropriate points in the text.

[21] Because of the relatively small numbers in several of the industries, we additionally explored the data through the construction of three sectoral groups for the statistical analysis of the paper. These groups were based on estimations of the sectors' coherence and

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[23] Because of the relatively small numbers in several of the industries, we additionally explored the data through the construction of three sectoral groups for the statistical analysis of the paper. These groups were based on estimations of the sectors' coherence and
"environmental profile" and, whilst broadly in line with other such groupings in the literature, must inevitably be treated as a maintained hypothesis. Group A ("low environmental profile") includes Mechanical and general engineering; Food and drink; Retail and leisure; Electrical and telecoms; and General sectors. Group B ("high environmental profile") includes Chemical, Oil and Gas; Pharmaceutical and General Manufacturing companies. Group C ("medium environmental profile") includes all the other firms. These groupings attempted to combine companies from similar industries together while facilitating a policy of differentiating between Groups to the largest extent possible. This exploratory grouping did not add significantly to the results and, given inevitable doubts one might have about such a maintained hypothesis, could have obscured the claims of the paper if they had done so. The results from this exploratory sectoral grouping are reported briefly in footnotes where appropriate. The sectoral grouping resulted in 368 observations n Group A, 92 observations in Group B and 206 observations in Group C.

In addition, regression analysis was employed to determine whether there is a linear relationship between company disclosures and share returns. The regression was estimated separately; namely for CSRTOT, VOLTOT and ENVTOT across the 14 different sectors spanned by the data. The co-efficients by were then examined and tested against the null hypothesis that no relationship exists between the variables being examined. No rejections of the null hypothesis were uncovered.

Other cut-off points were tested for the low, medium and high categorisation but the results remained virtually unchanged. These findings are available from the authors upon request.

Based on the cut-off points, 120 observations were classed as low return, 301 as medium return and 239 as high return firms.

These cut-offs resulted in 214, 248 and 198 observations being classified as small, medium and large CSRTOT disclosures.

These cut-off points, some 217 observations related to relatively "small" amounts of VOLTOT information, 258 related to "medium" amounts of VOLTOT data and 185 related to "large" amounts of VOLTOT news.

These cut-off points resulted in 193 small disclosures, 285 medium disclosures and 182 high disclosures.

CPRET is used as an abbreviation of Coded Percentage RETurns. The same convention is used for each of the coded variables discussed here.

In addition to repeating the tests with monthly data, all the analysis was performed with lagged disclosures as well as with the actual disclosures in the year of study. The correlation results with lagged disclosures were slightly better with three significant co-efficients being observed (CSRTOT in 1991, VOLTOT in 1990 and ENVTOT in 1990) however one would expect 3.6 out of 36 p-values to be significant at the 10 per cent level when the null hypothesis of "no relationship" holds.

This picture is confirmed when the correlations are calculated for the three sectoral groupings we introduced above. Indeed, four of these nine correlations (that is, between each of the three sectoral groupings and each of CSRTOT, VOLTOT and ENVTOT) are negative suggesting an inverse relationship between share price performance and the volume of disclosure. However, the correlations are small and none are statistically significant. Interestingly, though the largest correlation is achieved by the Chemicals, Pharmaceuticals and Oil & Gas firms grouping for the ENVTOT variable. These sectors in environmentally-sensitive industries have a positive correlation between the volume of their environmental disclosures and share returns of 0.116 which is nearly twice the size of the next highest correlation of 0.058 reported for CSRTOT. Again though, the p-value of 0.272 is still above the critical value of 0.05 thereby not allowing the null to be rejected.

The same analysis was repeated for the observations in each the constructed sectoral grouping and the observations in each year. For the three groupings, the chi-squared values range from 0.943 (with a p-value of 0.918) to 7.292 (with a p-value of 0.121) which all fail to reject the null hypothesis of no correlation between the return groups and the disclosure groups for each of CSRTOT, VOLTOT and ENVTOT.

And this is even if we had not determined to retain the more cautious 5% level throughout the analysis.

These tests were repeated using monthly, as opposed to annual, share price data. As monthly data were not available for all firms the sample was reduced (to 461 observations over 68 firms). This also had the effect of reducing the number of sectors represented and somewhat further skewing the data. The results were broadly the same (as with the annual data) although, when we repeated the tests on the sectoral groupings, there did appear to be a significant relationship between monthly share returns and CSRTOT for the (Group B) Pharmaceuticals and the Chemicals, oil and gas sectors. Sectoral relationships on a year-by-year basis produced, where significant at all, negative coefficients suggesting perhaps that investors are reacting negatively to CSR disclosure. Where statistically significant relationships could be identified, they were isolated and tentative. As with the annual data, whilst the suggestion of a potential relationship between social and environmental disclosure and share price returns is not beyond the bounds of credibility, these data and tests do not encourage particular enthusiasm about such relationships.

Therefore, although no correlation between CPRET (the coded variable for share price returns) and CPENV (the coded variable for environmental disclosure) is significant in any individual year, the overall correlation of 0.098 is significant with a p value of 0.012. Such a result may be attributable to the larger sample size for the overall test as well as to the fact that each of the nine annual correlations is positive and the combined evidence allows the null hypothesis to be rejected.

The chi-squared test statistic in this case has four degrees of freedom, one of which could be identified with a linear component and would have a p-value similar to that of the correlation coefficient. The remaining three degrees of freedom component would focus on the non-linear aspect of the relationship between the two variables.

These results are not shown in a table but provided in the body of the text. A more complete analysis of the partial correlations for each year is available from the authors on request.

We are grateful to Lee Parker for the initial suggestion to include this section. However, the practice of articulating a bank of statistical tests in simpler, or layperson, language is a useful one for a number of reasons. Not only does it seek to make the work more accessible to those to whom statistical method is not a natural form of reasoning but it forces the authors to focus on the initial purposes for the investigation itself and to clarify exactly where the weaknesses, assumptions and less-persuasive elements of the enquiry lie. We found writing this section both useful – and challenging.
And quite possibly, that further work might be better directed at field work and actually tracking reporting decisions on the ground. (See, for example, Miles et al, 2002).

To paraphrase John Stuart Mill, it is a matter of some puzzlement why it should be a matter of congratulation that a man (sic) who already has a great deal has acquired even more. And, in a more directly relevant sense, see Mathews (1987).