Environmental Performance (?), Profit, Size and Industry in UK Companies: A brief exploration

Jennifer Britton and Rob Gray,
CSEAR, University of Glasgow

DRAFT 1A: August 2001

Address for Correspondence: Rob Gray, CSEAR, Department of Accounting and Finance, University of Glasgow, G12 8LE, Scotland. E-mail: csear@accfin.gla.ac.uk

Abstract
This very short note reports on an initial "first pass" exploration of the widespread claims that companies which are environmentally responsible are also more economically viable. The starting point for the note is the publication of the Business in the Environment Index of Environmental Engagement 1999 which lists the largest UK companies' degree of involvement with environmental management processes. The results suggest that performance in the Index is associated with the size of the company and its reported profit in the year. However, when the data are analysed industry by industry the picture is less clear. The paper is clear about its serious limitations and concludes with a cautionary note about claims made for "environmental (or, indeed, social) performance".

Environmental Performance (?), Profit, Size and Industry in UK Companies: A brief exploration

An interesting (or, depending on your point of view, worrying) development in the popular and business press in recent years has been the claims that "it pays to be (environmentally) good", (see, for example, Edwards, 1998; Hill et al., 1994; Sadgrove, 1996; Schmidheiny, 1992). That is, it seems, one can pursue profits and be environmentally sound - there is no conflict between traditional economic pursuits and protection of the natural world. Unlikely as this might seem, there is a growing body of research which suggests that the claims may have some validity. Not only is there a now growing body of literature which demonstrates that 'ethical' investors need experience no financial cost to following their conscience (see, for example, Kreander et al, 2000 for a summary) but there is also a substantial body of research which seeks to explore directly the extent to which environmental performance is related to economic performance. Such research also tends to employ the standard descriptive factors of organisational life - namely size and industry sector - as either alternative explanatory variables of the environmental performance or, more usefully, as intervening variables. (For more detail, see, for example, Ullmann, 1985; Jaggi and Freedman, 1992; Pava and Krausz, 1996; Cordeiro and Sarkis, 1997; Stanwick and Stanwick, 1998; Richardson et al., 1999; Toms, 2000).

Such evidence is based on un-ashamedly positivistic analysis and the tensions that this produces plus the necessity to rely exclusively on observable data sets inevitably weakens the evidence. Indeed, (and most especially) the measures of environmental (or social or whatever) performance have not (to date at least) gone anywhere towards managing to assess any substantive measures of either eco-efficiency or ecological footprint of the firms concerned. Inevitably, therefore, such evidence can only relate to marginal, managerial assessments of environmental performance. As long as that is recognised (although it is not always the case) then it is our belief (indeed, our hope) that such studies do have value - albeit only indicative and tentative value.

In that spirit, this short piece provides some very tentative and indicative suggestions about environmental performance in an attempt to see whether the concerns expressed in the predominantly North American literature (see above) are worth further exploration in a UK context, (but see, especially, Toms, 2000). This is, thus, very much a "first pass" at the issue using some uniquely UK data on "environmental performance", the Business in the Environment Index of Environmental Engagement, (BiE, 1999).

Approach

Business in the Environment (BiE) is a semi-independent UK organisation which was established by the Prince of Wales as part of Business in the Community. It is funded by corporate membership. Since 1996, BiE has produced their Index of Corporate Environmental Engagement based on a self-reporting questionnaire sent to the UK's largest 100 companies[1]. The results are published as, if not a measure of large UK companies' environmental performance then at least, a measure of the extent to which the organisations concerned are beginning to take environmental issues more seriously. The 1999 Index ranks the 76 (out of 100) companies which replied to the questionnaire.

We took these 76 companies as the sample for this exploratory piece and collected data on the companies' reported profit (NEBIT) and turnover for 1999. In addition, BiE allocate their respondents to 8 industry sectors and we employed these sectors as well. The analysis was based, first, on all 76 companies and then, subsequently, on companies by industry sector. For the whole sample, two simple statistical tests were employed - chi-square and the Spearman Rank Correlation Coefficient. For the chi-square, companies' environmental position in the Index, their reported profit and turnover were allocated to four quartiles. For the Spearman Rank, the companies' ranking in the Index was taken, together with the rank of their size and profit (where '1' refers to the highest profit or the largest company and '76' refers to the lowest or the smallest). On the industry analysis, despite the very small numbers involved, only the Spearman was employed. The tests examined the null hypotheses that environmental performance and size/profit are unrelated to/independent of each other.

Results

 Across the whole sample the null hypotheses that environmental performance (as proxied by the Index) and size or profit are
independent of each other had to be rejected. The chi-square examination of the relative quartile of the companies' Index score and NEBIT gave a test statistic of 9.612 (at 95% confidence) whilst the Spearman Rank gave a correlation coefficient of 0.018 (at 99%). The chi-square examination of the relative quartiles of the companies' Index score and turnover gave a test statistic of 14.031 (at 99%) whilst the Spearman Rank gave a correlation coefficient of 0.284 (at 98%). Thus, insofar as the Index proxies for environmental performance, the inference to draw is that there is a significant, positive relationship between environmental performance and both size and profit - albeit the degree of association is relatively small.

Figure 1 reports the results of the Spearman Rank Correlations treating each of the BiE’s industry sectors separately and then testing for association between the environmental performance (the Index rank) and, respectively, rank of size and rank of profit. In all but one case a positive correlation coefficient is reported - the exception being the Services sector and profit where no correlation is found.

In the case of the relationship between the Index and profit, the coefficients are mostly on the small side apart from the Consumer and Retail sectors. However, in all cases the estimates are not reliable and the probability of Type 1 Error unacceptably high.

In the case of the relationship between the Index and the reported profit, the coefficients are generally stronger - although that for financial services would appear to be very close to zero. In the case of the strongest coefficients, for the sectors of Oil, Services and Consumer Products, the estimates are reliable at high levels of confidence.

Figure 1
Spearman Rank Correlation Coefficients of the BiE Index with Large Company Size and Profit

<table>
<thead>
<tr>
<th>Industry Sector</th>
<th>n=</th>
<th>The BiE Index is correlated with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Profit (NEBIT)</td>
</tr>
<tr>
<td>Oil, Gas, Chemicals and Mining</td>
<td>10</td>
<td>0.285</td>
</tr>
<tr>
<td>Utilities</td>
<td>9</td>
<td>0.217</td>
</tr>
<tr>
<td>Financial Sector</td>
<td>18</td>
<td>0.199</td>
</tr>
<tr>
<td>Services, Property and Transport</td>
<td>7</td>
<td>0.055</td>
</tr>
<tr>
<td>Industrial Manufacturing and Engineering</td>
<td>7</td>
<td>0.357</td>
</tr>
<tr>
<td>Consumer Products, Food, Drink</td>
<td>9</td>
<td>0.450</td>
</tr>
<tr>
<td>Electronics and Communication</td>
<td>10</td>
<td>0.138</td>
</tr>
<tr>
<td>Retail</td>
<td>6</td>
<td>0.543</td>
</tr>
</tbody>
</table>

|                                        |    | Size (Turnover)                 |
|                                        |    | 0.770***                        |
|                                        |    | 0.333                           |
|                                        |    | 0.055                           |
|                                        |    | 0.857**                         |
|                                        |    | 0.071                           |
|                                        |    | 0.617*                          |
|                                        |    | 0.333                           |
|                                        |    | 0.543                           |

Statistical significance is indicated by * =0.10; ** =0.02; *** =0.01

Discussion
It is fairly obvious that these suggestions must be treated with care (see final section) but they do encourage a few tentative points. It is relatively well-established in the literature that (largely) discretionary social and environmental activities are more likely to occur in larger companies and in certain industries. That the BiE Index ranking shows a strong association with the size of the company is no surprise, therefore. That the association also exists with the profit figure is a little less obvious - although the potentially more interesting suggestion. That is, whilst it may, of course, be that profit is simply proxying for size, it is equally plausible that one might expect the better managed companies to be both more profitable and more attuned to market and market-related developments such as the Index and the potential financial and risk savings to be had from good environmental management, (see, for example, Schaltegger and Burritt, 2000). As with all such positivistic analysis it is obvious that not only would more sophisticated analysis be needed before any reliable conclusions could be drawn but there is the small matter of theory and causality which needs to be better developed.

This last point is more obvious when the industry results are considered (in Figure 1). That is, in only three of the industry sectors is the Index associated, at a statistically significant level, with size and, in no cases, with profit. One obvious implication of this is that size only successfully discriminates between companies’ ranking in the Index within sectors, in only Oil, Services and Consumer Products. The naive expectation would have been that industries would cluster in that one might expect the better managed companies to be both more profitable and more attuned to market and market-related developments such as the Index and the potential financial and risk savings to be had from good environmental management, (see, for example, Schaltegger and Burritt, 2000). As with all such positivistic analysis it is obvious that not only would more sophisticated analysis be needed before any reliable conclusions could be drawn but there is the small matter of theory and causality which needs to be better developed.

This would, therefore, have expected companies within sectors to tend to be more alike than different. As a consequence, whilst we would, a priori, have expected that the Index might discriminate between industries, it is less obvious why it might discriminate within industries. It will need more penetrating statistical analysis than presented here to offer any persuasive suggestions.

Limitations
The limitations of the foregoing are relatively obvious. Aside from the limitations inevitably inherent in any such positivistic study, the relatively small sample, the simplicity of the statistics (which were driven by the nature of the Index as much as anything), the failure to account for interactions between variables and the single year analysis all council considerable caution. To take this form of analysis further will obviously require more extensive and careful work. (See, for example, Toms, 2000; for one set of approaches).

More particularly, the use of proxies such as the Index as a measure of environmental performance is clearly a potentially misleading practice. Whilst the data collected by BiE can, in all probability, be assumed to be reasonably reliable, it is clearly not a direct measure of environmental performance per se but rather a measure of the degree to which the processes of environmental management are being embedded in the organisation. As with the ISO 14000 environmental management standard series, the processes of environmental management need tell us nothing about actual environmental impact. So, importantly, we could draw no conclusions whatsoever about environmental impact from any analysis using the Index. Such conclusions would require detail on environmental performance indicators, eco-efficiency measures and, most especially, ecological footprint measures. These are not easily obtainable measures and, of more relevance, are clearly not the sort of data which organisations are willing to disclose voluntarily. As such, we need to be careful about any claims, by companies or in research, to be telling us about environmental performance (or, equally, social responsibility
performance) as the proxies are so obliquely related to the thing alleged that they mislead more than they inform.

This is probably one of the most important issues to be researched more carefully - and will only be researched successfully by more contextual approaches than taken here. Sustainability, environmental performance, environmental stewardship, social responsibility are all terms in wide currency. They are also terms about which there is a growing amount of "evidence" which suggests that they sit comfortably with traditional economic pursuits.

First, the "evidence", as in this case, is typically about something which might look like a proxy of the issue of concern - but usually is not (e.g. environmental management not environmental performance). Second, the global evidence is far more persuasive that traditional economic pursuit and social and/or environmental responsibility are in direct conflict, (see, for example, Beder, 1997; Eden, 1996). Our brief exploration here may, subject to its inherent limitations, have told us a little about reputation, size and 'good' management. It has almost certainly told us nothing at all about the environment.

References


[1] The BiE questionnaire asks the company questions about its management of environmental issues. The questions cover such matters as policy, EMS, environmental audit and stakeholder consultation and ask the company to state the extent to which such matters are developed and embedded. The questionnaire has now added a section on environmental performance. This covers energy, waste, transport, carbon dioxide emissions and water consumption and asks for levels of performance and targets for improvement. This relatively new development does, therefore, give the Index an element of environmental performance measurement.