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Climate Change, Carbon Management, and Disclosure in the UK FTSE 100: an example of sustainability

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Abstract: This paper examines the link between the Carbon Disclosure Leadership Index (CDLI) score and the extent of disclosure on climate change specific variables as a way to promote sustainability. The study used the UK FTSE top 100 companies to achieve the research objectives as this group of companies reflects the concept of sustainability. The results showed, in general, that commitment to environmental communication did not follow a linear route from low to high carbon sectors. For example, financials, a low carbon sector, disclose more on carbon emissions and climate change information compared with companies from medium to high carbon sector. In particular, the results also showed that disclosure by the top UK companies suggests a considerable awareness that climate change has become a theme of strategic choice and that they have developed the management systems and processes necessary to effectively manage their climate change and related business risks that will affect on enhancing sustainability.

Keywords: Sustainability, Carbon Disclosure Project (CDP), Climate Change, Carbon Management, Disclosure.

1 Introduction

Corporate Social Responsibility (CSR) has now become a pre-requisite for companies, large and small. A key component of CSR is the need for companies to deal with climate change. Since the publication of the Stern Report on Climate Change in 2006 the level of awareness on the part of companies on this issue has heightened greatly. An added emphasis has also been given to the issue of climate change as a result of the chaos in both the global economy and the financial markets over recent years. In particular, this has emphasized the value of effective disclosure. The financial crisis of 2008 suggests that there is a need to enhance our understanding of systemic risks that can cause significant de-stabilising impacts on the global economy (CDP, 2009b). Climate change can be considered as one of the most serious environmental threats affecting not only firms but the whole planet. Consequently, firms must react to the uncertain and ever changing environment as all sectors will be affected by the physical impacts of climate change because of its potential to cause disruption in the form of unforeseen, high-impact and massive negative economic consequences (Child, 1972; Cyert and March, 1963; Williamson, 1975; Stern, 2006; European Commission, 2008; Ghosh and Olsen, 2009; Sullivan, 2009; CDP, 2009a).

Drake et al. (2004) have argued that 'what is good for business is good for the environment'. Therefore, for companies to disclose on climate change activities, this will have clear implications not only in terms of transparency and accountability (FOE, 2002; Clapp, 2005) but also with respect to litigation, legislations and corporate climate governance structures (Smith, 2003; Ahman, 2006). While the financial accounting system has taken several hundred years to develop, carbon accounting is in its infancy. In order to achieve a coherent global system, the Carbon Disclosure Project (CDP) is leading the work of the Climate Disclosure Standards Board (CDSB), working with Deloitte, Ernst & Young, KPMG and PricewaterhouseCoopers to develop robust accounting standards to enable carbon reporting through the medium of annual financial reports. CDP and CDSB will also work with the World Economic Forum to advise the G20 group of nations on climate change accounting in 2010 (CDP, 2009b, p. 15). A wide range of studies have dealt with environmental accounting and voluntary disclosures. However, few have looked specifically at the voluntary disclosure of climate change data. Therefore, this study will measure the link between the Carbon Disclosure Project Leadership Index score and the extent of disclosure on climate change risks as away to promote sustainability. The UK FTSE top 100 companies were selected as an example of sustainable economy, not considered previously in academic research. There is a lack of research linking CDP and the disclosure levels of climate change risks and activities.

The paper is structured as follows. In the second section, the carbon disclosure project is presented. Thirdly, seven research questions are developed. Fourthly, the methodology, data collection and research variables are explained. Fifthly, the analyses of findings are illustrated and finally a conclusion is drawn.

2 What is the carbon disclosure project (CDP)?

The Carbon Disclosure Project (CDP) was developed in 2000 as a non-profit making organization. The CDP was set up in the UK; however, it embraces users from all over the world. The CDP's mission statement is 'to facilitate a dialogue between investors and corporations, supported by high quality information from which a rational response to climate change will emerge' (CDP, 2008:1).

Its purpose was to gather information (by means of a questionnaire) with regards to climate change, and make the information available to certain users. These users include investors, companies and governments. It provides information related to actions that have been taken into account by companies to reduce their adverse effect on the environment in general and on climate change in particular. Although the CDP was set up in 2000, it set out to retrieve its first set of data in 2003. It reports to the managers of companies regarding those particular areas where investors think improvements are required (CDP, 2004:4). Since 2003 there has been a steady increase in the number of companies supplying information to the CDP.

The method for calculating a company's Carbon Disclosure Leadership Index (CDLI) score is based on the responses to the questionnaires. The maximum number of points that can be scored is one-hundred and forty-six, which is scaled down to one hundred to give the maximum CDLI score. The CDP calculates a score for companies to enable them to measure how well they are performing by comparing their score with other companies in a similar industry, of similar size, or of a similar geographic location. The information included in the questionnaire is collected from companies mainly to examine the effect on climate change and can be categorized into a number of areas. First, how management keeps account of their greenhouse gas emissions; secondly, the action management intends to take on reducing the effect they have on the environment along with how they intend to make good use of any opportunities; and thirdly, climate change in relation to corporate governance (CDP, 2008:2)

3 Research Questions

This paper aims to examine the link between the Carbon Disclosure Leadership Index (CDLI) score and the extent of disclosure on climate change specific variables as way to promote sustainability. The study used the UK FTSE top 100 companies to achieve the research objectives as this group of companies reflect the concept of sustainability and UK can be considered one of the sustainable economies.

To achieve the research objective, seven research questions were developed:

Question 1: "Is there any link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on climate change activities"?

***Question* 2**: "Is there any link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on climate change risks"?

Question 3: "Is there any link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on footprint activities"?

Question 4: "Is there any link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on forward thinking"?

Question 5: "Is there any link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on climate change performance"?

Question 6: "Is there any link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on involvement with regulatory bodies"?

Question 7: "Is there any link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on climate change improvements"?

4 Methodology

This study investigates the relationship between Carbon Disclosure Project Leadership Index score and the extent of disclosure on climate change risks. To achieve this objective, seven research questions have been developed. To test the above questions the UK FTSE 100 companies are selected for a number of reasons. First, it can be deemed as the best example for British companies as it contains a diverse number of sectors including oil and gas, electricity, mining, chemicals, transport, utilities and insurance. Secondly, the UK FTSE 100 companies can be regarded as the most highly capitalised companies listed on the London Stock Exchange. Thirdly, the UK FTSE 100 companies can be considered, at present, the most likely to report on climate change activities (Levy and Newell, 2000; Varma, 2004; Okereke, 2007; Spada, 2008). According to the CDP 4 report, the group was responsible for about 73% of UK's total greenhouse gas emissions between 2003 and 2004 (CDP, 2006). Furthermore the majority of the UK FTSE top 100 companies are global players with business concerns (and considerable emissions) that span across various countries around the world.

To examine whether such relationships exist, data had to be collected in order to look for relationships between the leadership index and the voluntary disclosure variables. The main source was stand-alone corporate responsibility reports. However, annual reports and company websites were used in situations where corporate responsibility reports could not be found. The data collected related to the year 2008. The information collected was qualitative and had to be converted into numerical form to allow comparison. Some of the variables required either a *yes* or *no* answer. To turn these into numerical form, *yes* denoted a one and *no* denoted a zero, as prescribed by Sharp and Howard (1996). In some instances there were a variety of classifications within which a company could be classed. Ordinals were used with a different number relating to a different classification (Fisher, 2010).

The main variable for this study was the Carbon Disclosure Leadership Index Score. The score is out of one hundred. The researchers arranged this variable into ten classifications of scores. The Carbon Disclosure Project's 2009 report (details of the score based on the information gathered in relation to 2008) was investigated to allocate each of the UK FTSE top 100 companies under each score a certain classification. In relation to the disclosure variables, the researchers have arranged them into two groups. These are general variables that deal with industry sector, report format, report title, report length, and specific variables that related to climate change.

The *first* disclosure group of general variables includes the following (see Table 1 in Appendix):

- The *first* general variable considered was the sector of industry that the company was operating in. There were ten sectors identified.
- The *second* general variable was the corporate social responsibility reporting format. The researchers classified this variable into four, stand-alone corporate social reports. If this could not be found, then the annual reports were investigated. If no information could be found within the annual reports then the researchers depended on information available on the companies' websites. If there was no information on the website, it was concluded that no corporate responsibility information existed.
- The *third* general variable considered was the title of the report. There were ten possibilities.
- The *fourth* general variable considered was the length of the report. There were five classifications, where annual reports were concerned; only the pages relating to carbon management were counted.
- The *fifth* general variable was whether the sector within which the company operated ~~in~~ was carbon intensive. The researchers used the prior research of Spada (2008) to classify the FTSE top companies. Spada (2008) had three levels of intensity; low, medium and high, showing which sectors belonged in each classification.

The second disclosure group' of variables investigated are related to climate change variables. It includes the following specific variables:

- The *first* specific variable was climate change activity. The UK FTSE top 100 companies were investigated to examine whether the company effectively managed carbon data and are transparent with the information – by publicly disclosing their climate change activities.
- The *second* specific variable was the management of climate change risk. Companies were investigated to examine whether the company implemented innovative ideas to capitalize on climate change opportunities and apply well designed solutions to manage climate change risks. To prove this, evidence of the company taking advantage of opportunities brought by climate change was sought. Evidence of managing climate change risks was also researched.

- The *third* specific variable was footprint. Companies were investigated to examine whether the company disclosed on measures taken to reduce carbon footprint (such as reduction of energy consumption; replacement of fossil fuel with renewable energy; and the offsetting of emissions). The reduction in energy consumption, utilization of renewable energy and the offsetting of carbon emissions were evidence of an attempt at reducing the carbon footprint.
- The *fourth* specific variable was forward thinking. Companies were investigated to examine whether the company disclosed on climate change and were proactive in addressing climate change – by having established emissions reduction plans, targets and publishing forecasts. The main information required were their plans for reducing future emissions, long-term targets and forecasts of expected emission levels.
- The *fifth* specific variable was climate change performance. Companies were investigated to examine whether the company reported fully on performance and performance as evaluated against targets.
- The *sixth* specific variable was their involvement with regulatory bodies. Companies were investigated to examine whether the company effectively disclosed-information related to how companies engaged positively with policymakers on developments in climate change. In addition, evidence was sought to determine whether the company was either keeping up to date with the recommendations of environmental bodies, or changing to fit in with the requirements of regulatory bodies.
- The *seventh* specific variable was climate change improvements. Companies were investigated to examine whether the companies disclosed information on how they drove their business towards climate change mitigation – by offering incentives, often financial, to employees for individual management of climate change issues. This variable looked specifically at encouraging employees to become aware of their actions in relation to climate change.

5 Results

5.1 Results of the general variables

CDLI Score and industry sector

Classification of the UK FTSE top 100 companies in relation to industry sector is shown in Table 1 in Appendix.

The conclusion can be reached that identifying risks and opportunities concerning climate change is now being investigated to some degree by most companies across all industries. The link between each industry and the CDLI score categories is shown in Table 2 in Appendix. The most interesting result is that the financial sector was present in every CDLI score category, including the highest. The financial sector performed on a par with generally higher scoring more carbon-intensive sectors, and above the average score for all companies. This result suggests that, although not having a large direct exposure to carbon, the indirect exposure of the financial sector to climate change through trading, investment and lending operations is significant.

CDLI score and report format

One of the disclosure variables was in report format. Most (71%) of the UK FTSE top 100 companies publish separate sustainability reports. Some 26% of the FTSE top 100 reported on environmental/sustainability issues only within their annual report and accounts. 3% of the FTSE top 100 companies have adopted web-only sustainability reports. When investigating whether there is a link between report format and CDLI score as shown in Table 2 in Appendix, the results showed that companies that scored high in the CDLI tended to produce a stand-alone corporate responsibility report. However, this result cannot be generalized as companies that produced information on their website had a score ranging between forty and seventy-nine.

CDLI score and report title

One of the disclosure variables was the report title. The results showed that the more common titles are Corporate Responsibility Report (35), followed by Annual Report and Accounts (20). (See more details in Table 2 in Appendix). In addition to the above, nine companies created their own unique title such as “How We Do Business” and “Living Corporate Review”. When investigating whether there is a link between the report title and CDLI score as shown in Table 2 in Appendix, the result suggests that the title of the report containing the information about carbon emissions and similar, does not appear to have an impact on the CDLI score. The company with the highest CDLI score opted for the “Climate Confidence” title. However, only one company used this title so insufficient evidence exists to say that this title guarantees a high CDLI score. Reports with the title "Corporate Responsibility Report" congregate round the CDLI scores between forty and eighty-nine. An explanation for this is that the title of the report has no effect on the CDLI score as it does not provide an answer to any question in the questionnaire. Some companies may lack motivation when it comes to creating a title for their reports and, therefore, choose to copy other companies. There is also the fact that using a generic term will allow stakeholders to easily identify the type of content within the report.

CDLI score and page count

One of the disclosure variables was the page count devoted by the UK FTSE top 100 companies to their reporting as a basic measure of commitment to environmental communications. Given the complexity of environmental issues, one might assume that companies would try to communicate their policies and performance effectively to various stakeholders by producing big reports (Spada, 2008). However, it might be possible that companies with the shortest reports communicate complex issues more effectively than those with the longest reports. The results showed that there is almost an equal number of companies using fewer than five pages (46%) and between six and twenty pages (45%). Very few companies have a report of more than twenty pages (8%) with none having more than one hundred pages. When investigating whether there is a link between report format and CDLI score as shown in Table 2 in Appendix, the results showed that the two most common page lengths have a very large range from zero to eighty-nine, with a page count of five to twenty featuring in the ninety plus category. The report that was over fifty pages long featured in the eighty to eighty-nine category. However, once again a score like this cannot be guaranteed to be accurate with the level of page count as only one report of this length featured in the sample. Explanation for achieving this result is extremely difficult because the nature of the information included in the reports makes comparison difficult. Some reports contain narrative only, whereas other reports contain graphs, tables and charts, all emphasising the message that the company cares about the effect it is having on the environment. There is also no standard layout that must be conformed to, making it difficult for companies to decide what information may be deemed relevant by the stakeholders. A company may be able to achieve a high CDLI score because they know all the information.

However, they do not disclose this as they deem it out with the scope of the stakeholders information needs.

CDLI score and carbon intensity

One of the disclosure variables was carbon intensity. The results showed the split between the three intensity levels. There are more high intensity companies (43%) than medium and low (36%), with medium intensity level being the least represented category in the FTSE top 100 companies (21%).When investigating the relationship between carbon intensity and CDLI score as shown in Table 2 in Appendix, the results showed that there is no relationship between the intensity level of a company and its CDLI score. All intensity levels feature in a wide range of CDLI score categories, which show that the carbon intensity level of a company does not affect its CDLI score. This result is highly accepted as CDP 2009 has made no distinction between high and low carbon intensive sectors (CDP, 2009b).

5.2 Results of Climate Change Specific variables

The primary finding was that most FTSE top 100 companies have developed the management systems and processes necessary for them to effectively manage their climate change and related business risks. The majority of the companies considered in the study had clear management accountabilities for environmental and/or climate change issues, published environmental and/or climate change policies and, provided at least some information on their perceptions of the risks and opportunities presented by climate change. All climate change specific variables that have been considered in this study are presented in Figure 1.

Figure 1 Climate change specific variables

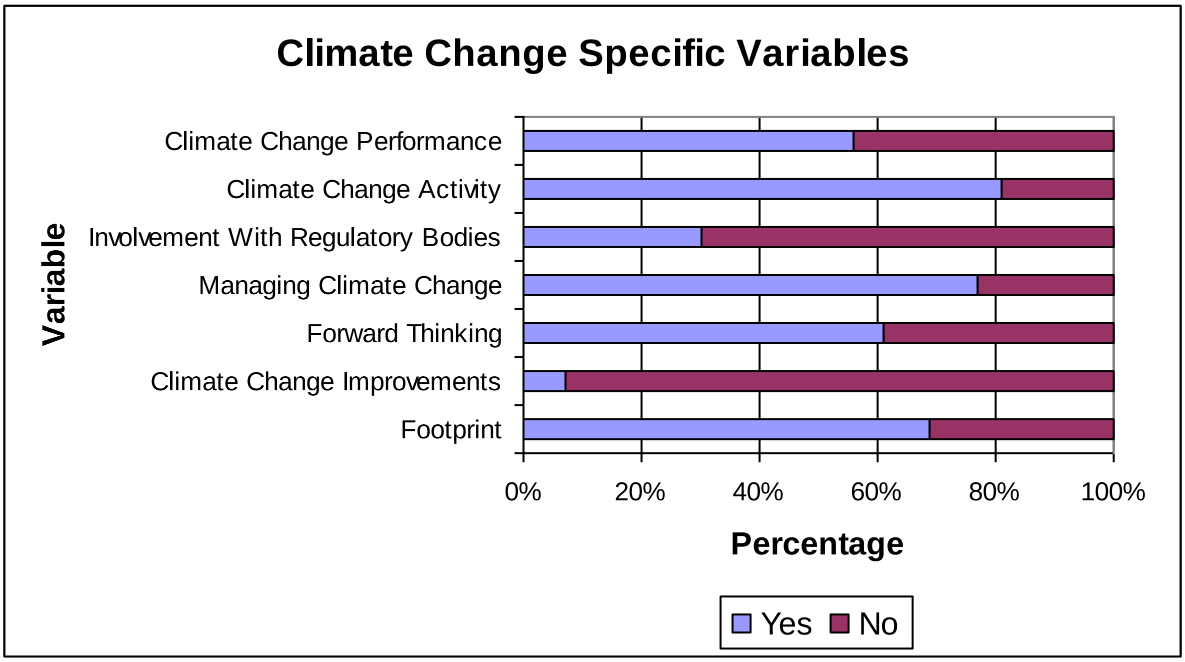


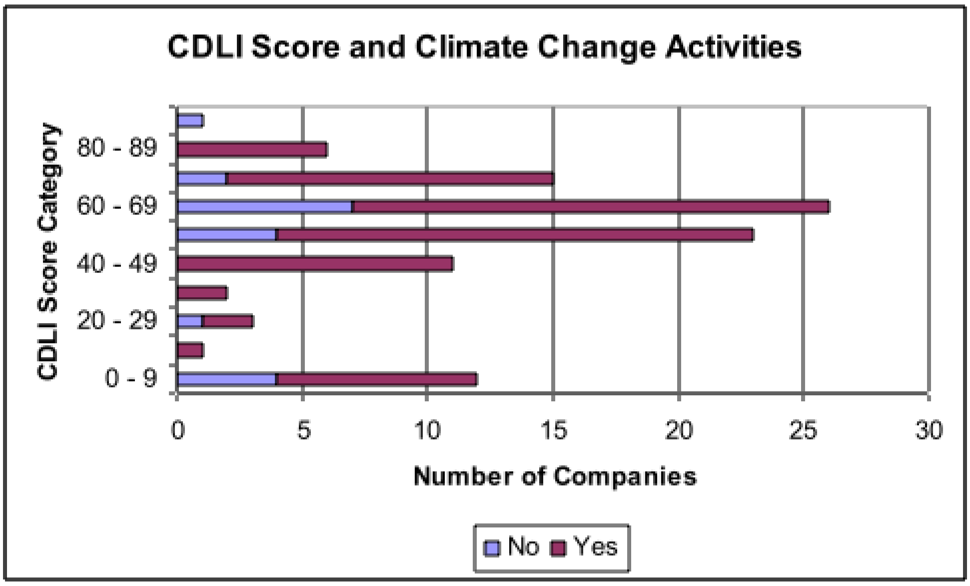
Figure 1 displays the variables researched and the split between the number of companies that either disclosed on these variables or not. Ranking the variables with regards to management's perception of importance would put climate change activity, managing climate change risk and footprint as the top three, followed by forward thinking. On the other hand, climate change performance, involvement with regulatory bodies and climate change improvements would be considered the three least important variables. The majority of FTSE top 100 companies (80%) disclosed information related to the activities implemented in an attempt to reduce carbon emissions and, therefore, the effect the company has on climate change. The high disclosure level indicates that companies perceive reporting on climate change activities to be extremely important. Also 79% of FTSE top 100 companies reported on climate change risk. This deals with details of any innovative ideas and well designed solutions that capitalise on climate change opportunities and climate change risks respectively. Furthermore, 68% of the FTSE top 100 companies disclosed information about their carbon footprint. The footprint-disclosed information included some measures to reduce the carbon footprint such as reducing the level of energy consumed, replacing the use of fossil fuels with renewable energy resources and offsetting emissions. This indicated that most companies consider the disclosure of carbon footprint activities to be important. In addition, 61% of FTSE top 100 companies disclosed some information related to a forward thinking variable. Forward thinking deals with climate change in a proactive manner by publishing future targets and forecasts on emission reduction plans. This high level would indicate that companies consider disclosing plans for the future to be of high importance. Additionally, 56% of FTSE top 100 companies choose to disclose on climate change performance. This variable looked at whether the company reported fully on emission reduction performance, and evaluated performance against targets. It seems intuitive that companies would want to disclose performance. However, the large number of companies that do not disclose this information may not have facts that indicate targets are being met, and emissions are being reduced. On the other hand, 29% only of FTSE top 100 companies reported on their involvement with regulatory bodies. Companies that comply with this variable would report on engagements with regulatory bodies, helping to further develop policies dealing with climate change. As previously mentioned, addressing the problem of carbon emissions is a new development so businesses might not have the necessary knowledge and experience to contribute effectively to the creation of climate change policies. Likewise, a small minority of FTSE top 100 companies (7%) choose to disclose information about the climate change improvements. Climate change improvement looks at how a company attempts to drive their business towards reducing their impact on climate change by encouraging employees to manage their own emissions. Monetary incentives are usually the form of encouragement. There are two possible reasons for this low level of disclosure. The first reason is that companies might not incentivise employee efforts in reducing emissions, whilst the other reason may be that companies do not consider this action worthy of disclosure.

CDLI score and climate change activities

One of the disclosure variables was climate change activities. All the FTSE top 100 companies' reports have been investigated to check whether the company effectively manage carbon data and are transparent on the information – by publicly disclosing their climate change activities. The results showed that 80% of the FTSE top 100 companies disclosed information related to the activities implemented in an attempt to reduce carbon emissions. Despite the large number of companies that reported such information, the quality of the disclosed information was mixed as there was no universal style of disclosure. For example, although most companies disclosed on how they calculated their emissions data some companies explained either by referencing the WBCSD Greenhouse Gas Protocol (WBCSD/WRI, 2004) or other calculation protocol it was not clear that the emission calculation protocols were used strictly. This result is consistent with prior studies of

(Sullivan, 2009) where the study did not provide any evidence of applying emission calculations rigorously. When investigating the link between CDLI score and climate change activities, the results showed that those companies that report on climate change activities tend to have a CDLI score greater than fifty percent, as can be seen in Figure 2.

Figure 2 CDLI score and Climate Change Activities

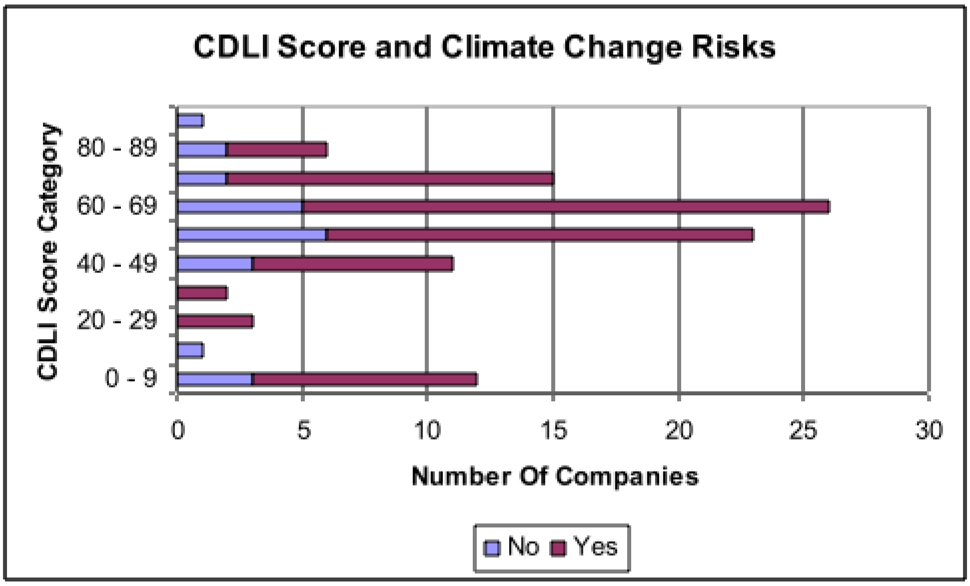


This is not true in all cases as eight companies reporting on climate change activities have a CDLI score between zero and nine. Of the companies that do not report on climate change activities, most of them have a CDLI score between fifty and seventy-nine, making it difficult to determine whether a relationship exists. Explanation for the result might be because companies with higher CDLI scores have discussed in greater depth their climate change activities and this might enable them to achieve a high score. Therefore, question one provides mixed answer on the link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on climate change activities

CDLI Score and climate change risks

One of the disclosure variables was managing climate change risk. The results showed that 79% of FTSE top 100 companies reported on climate change risk and published their views on the risks and opportunities presented by climate change. It deals with details of any innovative ideas and well designed solutions that capitalise on climate change opportunities and climate change risks respectively. When investigating the link between managing climate change risk and CDLI score, the results showed that this link is not clear. The majority of companies are featured in the forty to ninety plus categories, featuring companies that both do and do not report on climate change risks as can be seen in Figure 3.

Figure 3 CDLI Score and Climate Change Risks

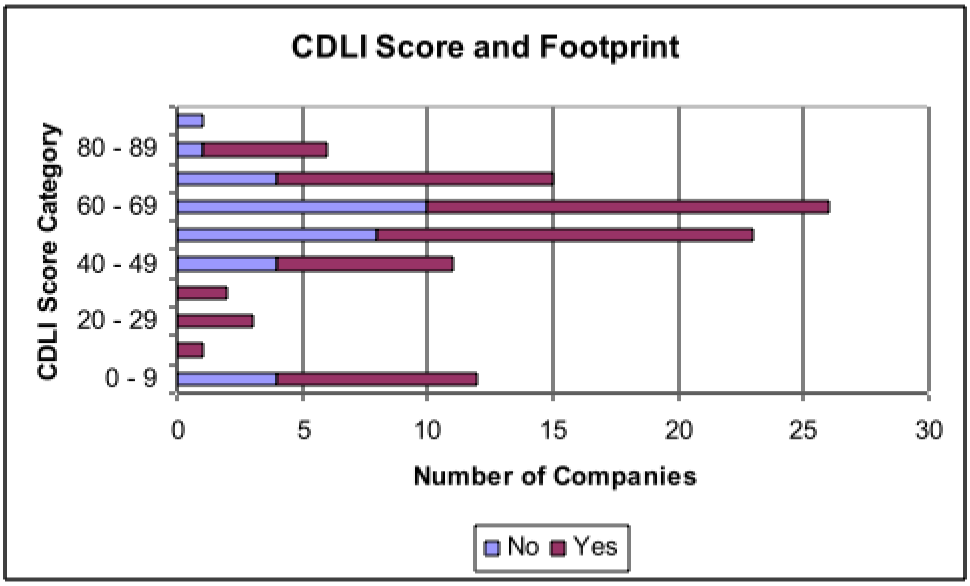


An explanation for this result ~~is~~ may be due to the level of disclosure on climate change risks. Companies with higher CDLI scores tend to discuss in great depth how they have handled their climate change risks and this in turn assists them in answering a CDP questionnaire and achieving high score. Therefore, question two provides mixed answer on the link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on climate change risks.

CDLI score and footprint

One of the disclosure variables was footprint. The results showed that 68% of the FTSE top 100 companies disclosed information about their carbon footprint. The footprint-disclosed information included some measures to reduce the carbon footprint such as reducing the level of energy consumed, replacing the use of fossil fuels with renewable energy resources, and offsetting emissions. This indicated that most companies consider the disclosure of carbon footprint activities to be important. When investigating the link between footprint and CDLI score, the results showed similar results to the two previous variables (climate change activities and climate change risk). Most of the companies have a CDLI score above forty per cent, with a mixture of companies that choose to disclose and those that refrain from the disclosure of information relating to the carbon footprint as can be seen in Figure 4.

Figure 4 CDLI Score and Footprint

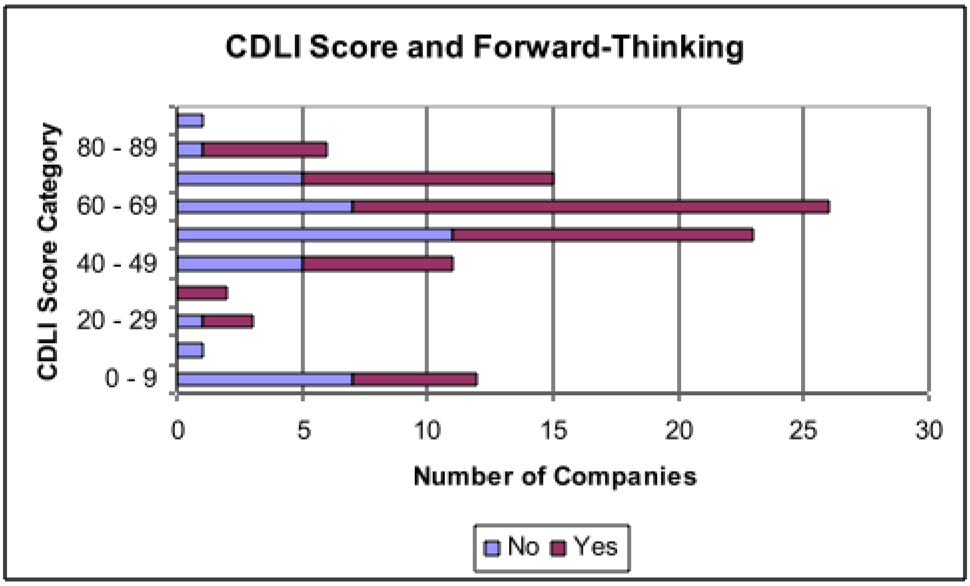


As a result of this, the conclusion can be reached that no clear relationship exists between the CDLI score and this variable. It can be said here that there are many different ways of calculating carbon footprint. Some emissions may be impossible to quantify for some companies, whereas others may find it easy. Some of the results may be displeasing and are therefore not made public in order to protect the reputation of the company. Therefore, questions three provides mixed answer on the link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on footprint activities

CDLI Score and forward thinking

One of the disclosure variables was forward thinking. The results showed that 61% of the FTSE top 100 companies disclosed some information related to the forward thinking variable. Forward thinking deals with climate change in a proactive manner by publishing future targets and forecasts on emission reduction plans. They published some information related to greenhouse gas emission targets, with most expressing their targets in relative terms (i.e., emissions per unit of production or turnover). This high level would indicate that companies consider disclosing plans for the future to be of high importance. There were some differences between the companies in the time scale of the disclosure. Some companies set targets for short-term (next year), while others extended their targets beyond the short term (beyond 2020). When investigating the link between forward thinking and the CDLI score, the results showed that those companies that reported on forward-thinking activities tend to have a higher CDLI score. The same can be said of companies that chose not to report on the forward-thinking activities as can be seen in Figure 5.

Figure 5 CDLI Score and Forward Thinking

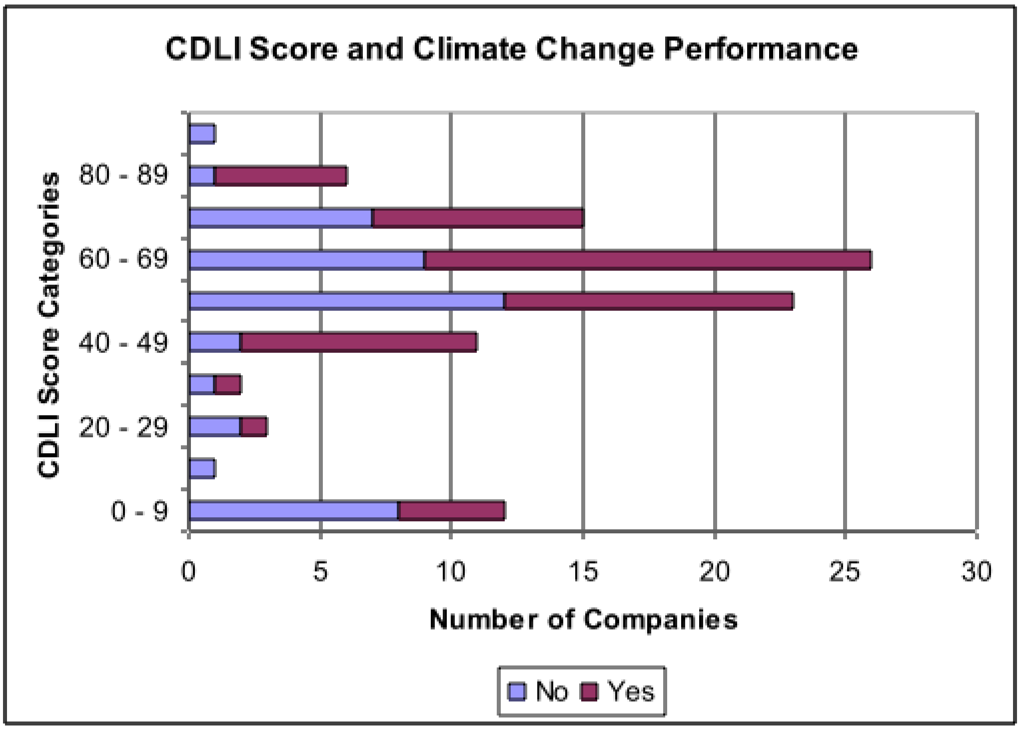


This would suggest that reporting on forward thinking activities is likely to assist the company to get a higher CDLI score but, not reporting on this variable does not necessarily prevent achieving a high CDLI score. Hence, question four provides mixed answer on the link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on forward thinking.

CDLI Score and climate change performance

One of the disclosure variables was climate change performance. The results showed that 56% of the FTSE top 100 companies disclose information not only on climate change performance but also on climate change performance against targets. This variable looked at whether the company reported fully on emission reduction performance, and evaluated performance against targets. It seems intuitive that companies would want to disclose performance. However, the large number of companies that do not disclose this information may not have facts that indicate targets are being met, and emissions are being reduced, when investigating the link with climate change performance. Figure 6 displays the number of companies that report on climate change performance as well as the number of companies that do not disclose this researched variable, at each of the CDLI score categories.

Figure 6 CDLI Score and Climate Change Performance

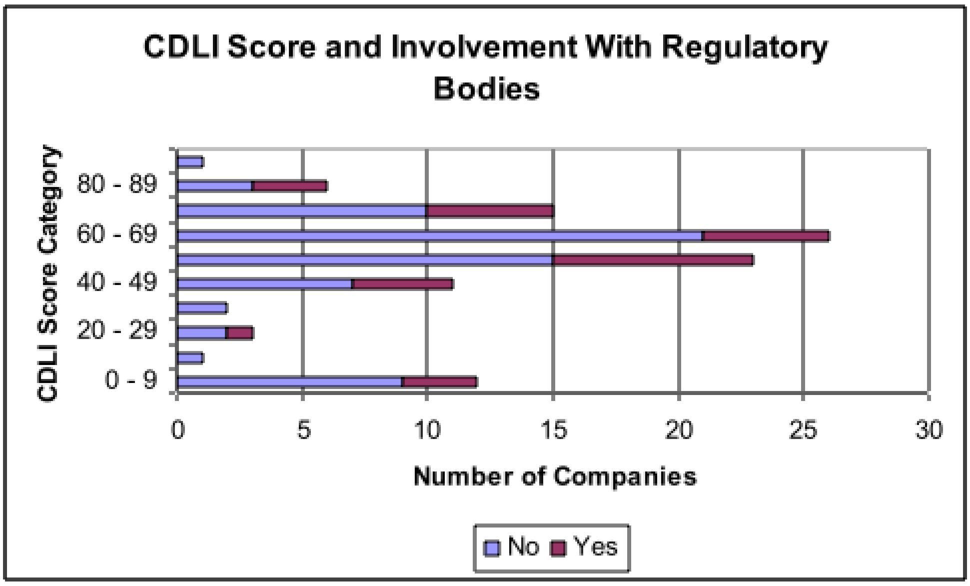


Most companies reporting on climate change performance feature in the CDLI score categories above forty percent. The same can be said for companies that do not report on climate change performance. It can be said here that CDLI score doesn't discriminate between companies that disclose on climate change performance and companies who do not. It can be said here that different companies operating in different industries face differing levels of difficulty when it comes to reducing emissions. As a result, future targets may not be set because the impacts any changes will have are not yet clear or the company is already struggling to find new innovative ideas. Hence, question five provides mixed result on the link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on climate change performance

CDLI Score and involvement with regulatory bodies

One of the disclosure variables was involvement with regulatory bodies. The results showed that 29% only of the FTSE top 100 companies reported on their involvement with regulatory bodies. Companies that comply with this variable would report on engagements with regulatory bodies, helping to further develop policies dealing with climate change. As previously mentioned, addressing the problem of carbon emissions is a new development so businesses might not have the necessary knowledge and experience to contribute effectively to the creation of climate change policies. When investigating the link between involvement with regulatory bodies and CDLI score, as can be seen in Figure 7, it shows that a relationship is non-existent.

Figure 7 CDLI Score and Involvement with Regulatory Bodies

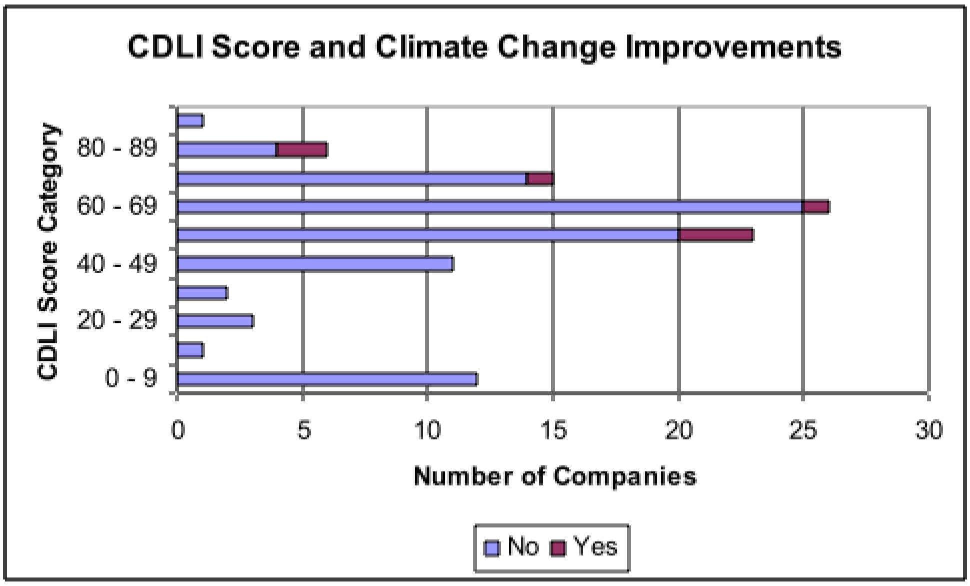


The range of scores for either both reporting and choosing not to report on the involvement with regulatory bodies is too wide for a relationship to be in existence. It seems that disclosure on any involvement with regulatory bodies does not affect the CDLI score or it might be because 29% only of the FTSE top 100 companies disclose on this variable. The main explanation for this result may be there are few regulations issued by the regulatory bodies so any interaction may not feature as part of the CDLI questionnaire questions. Therefore, question six provides a negative answer that there is no any link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on involvement with regulatory bodies. .

CDLI Score and climate change improvements

One of the disclosure variables was climate change improvements. The results showed that 7% only of the FTSE top 100 companies choose to disclose information about the climate change improvements. There are two possible reasons for this low level of disclosure. The first reason is that companies might not incentivise employee efforts in reducing emissions, whilst the other reason may be that companies do not consider this action worthy of disclosure. When investigating the link between climate change improvements and CDLI score, the results showed that those companies that reported on climate change improvements received a CDLI score greater than fifty-percent as can be seen in Figure 8.

Figure 8 CDLI Score and Climate Change Improvements



Not reporting on climate change improvements did not prevent a high CDLI score, as evidenced by the fact that the company with the highest CDLI score did not satisfy the requirements of the climate change improvements variable. Those companies with low CDLI scores could increase their score by reporting on this variable. Only 7% of companies reported on this variable so the conclusion reached might differ were a greater number of companies in a sample to report on this variable. Hence, question seven provides mixed answer on the link between the Carbon Disclosure Project Leadership Index Score and the extent of disclosure on climate change improvements this is because of the low level of disclosure on climate change improvements.

6 Conclusion

The findings of the general variables suggest that commitment to environmental communication does not follow a linear route from low to high carbon sectors. For example, financials, a low carbon sector, disclose more on carbon emissions and climate change information compared with companies from medium to high carbon sector. In addition, the majority of the UK FTSE top 100 companies report on carbon management and climate change activities in separate reports titled 'corporate responsibility reports'. When investigating the link between the general variables and CDLI score, the results showed that most of these variables have no effect on the CDLI score. A possible reason might be that there were no questions related to these variables in the questionnaires sent to these companies. This is perhaps an aspect of the study that could be followed up in a later study.

The findings of the climate change specific factors suggest that disclosure by the top UK companies reveals a considerable awareness that climate change has become a theme of strategic choice and that they have developed the management systems and processes necessary for them to effectively manage their climate change and related business risks. There were some differences among the variables in relation to the level of disclosure. In addition, The UK FTSE top 100 companies tend to disclose more on: climate change activities, managing climate change risk, footprint and forward thinking, compared with climate change performance, involvement with regulatory bodies and climate change improvements. When investigating the link between the specific variables and CDLI score, the results partially supported some questions and rejected others. It can be concluded that companies with a higher CDLI score tend to disclose in greater detail compared to companies with a lower CDLI score. The role of climate change regulatory bodies, both at the national and supra-national level (e.g. EU), represents an on-going challenge for both large and small companies in the UK to tackle.

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Appendix

Please insert Table 1 and 2 here

IJSE-12002 Appendix – Editor's remarks

Table 1 Number of FTSE companies for general variables

General Variables	Number of FTSE top 100 companies						
Industry	(9) Oil and Gas	(11) Basic Materials	(10) Indu-strials	(8) Consumer Goods	(17) Consumer Services	(4) Health care	(5) Telecommu nications
Report Format	(71) Stand Alone CRR	(26) CRR embedded in AR	(3) Web Based CRR				
Report Title	(9) CSRR	(35) CRR	(16) SR	(20) ARA	(1) Report To Society	(2) HSE	(2) CCR
Page Count	(46) <5	(45) 6-20	(8) 21 - 50	(1) 51 - 100			
Carbon Intensity	(43) High	(21) Medium	(36) Low				

Abbreviations:

AR = Annual Report

ARA = Annual Report and Accounts

CR = Corporate Report

CRR = Corporate Responsibility Report

CCR = Corporate Citizenship Report

CSRR = Corporate Social Responsibility Report

EMR = Environmental Management Report
HSE = Health, Safety and Environment
SR = Sustainability Report

Table 2 The link between SCDLI score and the general variables

	Number of companies			
SCDLI Score	Industry	Report Format	Report title*	Page count
0-9	(3) Oil & Gas (2) Basic Materials (1) Consumer Goods (1) Consumer Services (1) Health Care (2) Telecommunications (2) Financial	(8) CR Integrated with AR (4) Stand Alone CR Report	(1) CRR (1) SR (7) ARA (1) CCR (1) EMR (2) Other	(7) <5 (3) 5 - 20 (2)21 - 50
10-19	(1) Financial	(1) CR Integrated with AR	(1) ARA	(1) <5
20-29	(2) Consumer Services (1) Financial	(2) CR Integrated with AR (1) Stand Alone CR Report	(2) ARA (1) CCR (1) EMR	(1) <5 (2) 5 -20
30-39	(1) Basic Materials (1) Financial	(2) Stand Alone CR Report	(2) SR	(2) 5 - 20
40-49	(1) Oil and Gas (1) Basic Materials (5) Consumer Services (4) Financial	(1) Web Information Only (1) CR Integrated with AR (9) Stand Alone CR Report	(1) CSRR (7) CRR (1) SR (2) Other	(5) <5 (4) 5 – 20 (2) 21 - 50
50-59	(4) Oil & Gas, (1) Basic Material, (4) Industrial, (1) Consumer Goods, (1) Consumer Services, (1) Telecommunications, (3) Utilities, (7) Financial and (1) Technology	(5) CR Integrated with AR (18) Stand Alone CR Reports	(3) CSRR (12) CRR (1) SR (3) ARA (1) Report To Society (1) HSE (2) Other	(12) <5 (9) 5 – 20 (2) 21 - 50
60-69	(5) Basic Materials, (2) Industrials, (4) Consumer Goods, (3) Consumer Services, (1) Health Care, (1) Telecommunications, (5) Utilities, (4) Financial and (1) Technology	(1) Web Information Only (6) CR Integrated with AR (19) Stand Alone CR Report	(10) CRR (7) SR (5) ARA (1) HSE (1) CCR (1) EMR (1) Other	(8) <5 (17) 5 - 20 (1) 21 - 50

70-79	(1) Oil and Gas, (1) Basic Materials, (3) Industrials, (2) Consumer Goods, (4) Consumer Services, (1) Health Care, (1) Telecommunications and (2) Financial	(1) Web Information Only (3) CR Integrated with AR (11) Stand Alone CR Report	(2) CSRR (3) CRR (5) SR (3) ARA (1) CCR (1) EMR	(9) <5 (6) 5 - 20
80-89	(1) Industrials, (1) Consumer Services, (1) Health Care, (1) Utilities and (2) Financial	(6) Stand Alone CR Report	(4) CRR (1) SR (1) CCR (1) EMR	(2) <5 (1) 5 – 20 (2) 21 - 50 (1) 51 - 100
90+	(1) Financial	(1) Stand Alone CR Repor	(1) Climate Confidence	(1) 5 - 20

Abbreviations:

AR = Annual Report

ARA = Annual Report and Accounts
CR = Corporate Report

CRR = Corporate Responsibility Report

CCR = Corporate Citizenship Report

CSRR = Corporate Social Responsibility Report

EMR = Environmental Management Report
HSE = Health, Safety and Environment
SR = Sustainability Report