

Does Corporate Environmental and Social Responsibility Matter for Firm Performance in the UK?

Submitted by

Yan Qiu

to

the University of Exeter

as a thesis for the degree of

Doctor of Philosophy in Accountancy

June 2013

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Abstract

In this thesis first, I investigate the link between firms' environmental and social disclosures (ESD) and their profitability, as well as establish the direction of causality between the two. Second, I examine the association between ESD with firms' market value, employee productivity and carbon eco-efficiency respectively. Finally, I examine the relations among firms' CSR related board attributes, CSR strategy and their environmental and social performance (ESP).

The first empirical chapter shows that firms with higher profitability tend to provide more ESD, which is consistent with the accounting- and economics-based arguments that ESD involve a real as well as an opportunity cost that more profitable firms with higher slack resources are better able to afford.

The results regarding market value analysis show that overall ESD, in particular social disclosures matter to investors. Investors appear to be placing higher values on firms seen to be behaving in a socially responsible manner. Presumably, more responsible behaviour in the social arena reflected in higher disclosure helps to mitigate the information asymmetry, and hence the perceived social risk of the firm. Investors thus place higher values on such firms. The evidence on the link between firms' ESD and their ESP measures supports this explanation. Specifically, I find that more social (environmental) disclosure in prior year reflects better social (environmental) performance as captured by higher employee productivity (more carbon eco-efficiency) in the current year.

The results of the final empirical chapter show that boards having certain CSR-conducive attributes, particularly independent directors, women directors, and directors with financial expertise on the audit committee, are more likely to develop a multi-pronged CSR strategy which in turn translates into superior environmental and social performance. Furthermore, I find that firms with better ESP tend to further strengthen their board CSR orientation. In other words, the analysis suggests the presence of a positive and cyclical link between CSR orientation, firm CSR strategy, and firm environmental and social performance.

Acknowledgements

I am sincerely and heartily grateful to my supervisors, Dr. Amama Shaukat and Professor Kevin McMeeking, for their support, feedback, constructive criticism and guidance throughout my Ph.D. I am sure it would not have been possible without their help.

I am also deeply indebted to Professor Richard Macve, Professor David Gwilliam and Professor Jo Horton, whose guidance, encouragement and support made this thesis possible.

I would like to express my gratitude to the academic and supporting staff, and friends in the Business School, who have kindly provided support and friendship that I needed throughout these years.

Finally, my great and sincere thanks go to my parents, for their endless love and support that has constantly encouraged me till the end of this long journey. Besides, I wish to thank my husband Xin, a true and great supporter who has unconditionally loved me during my good and bad times.

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Chapter 1: Introduction

1.1 Background and motivation

The credit crisis and climate change have led mainstream investors to become increasingly aware of sustainability reporting as an important information source of insight into the long-term viability of companies. The UK was the first country to introduce mandatory carbon reporting. The Deputy Prime Minister of the UK at the Rio+ 20 Submit 2012 said that,

“Counting your business costs while hiding your greenhouse gas emissions is a false economy...British companies need to reduce their harmful emissions for the benefit of the planet, but many back our plans because being energy efficient makes good business sense too. It saves companies money on energy bills, improves their reputation with customers and helps them manage their long-term costs too.” (Source: published by the Department for Environment Food and Rural Affairs website on 20th June 2012)

The financial crisis is an opportune time to refocus on how firms are managing their environmental and social responsibility. 90% of UK large public companies now report regularly on the environment and social impacts of their business operations (Grayson, 2007, p.5). Moreover, there is evidence particularly from the UK to suggest that firms are now producing higher and better quality environmental and social disclosures (Gray et al., 1995). With the rising trend in the quantity and quality of environmental and social disclosures, a number of studies have examined the link between a firm’s environmental disclosures and its financial performance including profitability (Brammer and Pavelin, 2006, 2008; Clarkson et al., 2008; Cormier et al., 2011; Freedman and Jaggi, 1988; Patten, 1991). However, all of these mentioned studies find no link between environmental disclosures and various measures of a firm’s profitability. Discussing the limitations of their own work, and that of others, Brammer and Pavelin (2008) suggest that future work should use longitudinal data and try to resolve causality concerns. In this thesis, I address both these issues. Using longitudinal data (2005-2009), I first establish the contemporaneous association between environmental and social disclosures and firm profitability, and then drawing upon Nelling and Webb’s (2009) application of Granger causality methodology I address the issue of causality between these variables.

There has also been a substantial increase in socially responsible investment in recent years in the UK, especially the growth in the number of socially

responsible investment funds offered by institutional investors. Institutional investors are playing an important role in progressing corporate social responsibility and have an important role in promoting more responsible business behaviour. *“There has been a substantial increase in socially responsible investment in recent years in the UK, especially the growth in the number of socially responsible investment funds offered by institutional investors who are demanding improvements in social and environmental disclosure generally”* (Solomon, 2007; p.241). Yet, according to Clarkson et al. (2011), less than 50% of surveyed chief financial officers and top environmental officers believe environmental responsibility can enhance shareholder value. However, from a capital market’s perspective, public disclosures of how a firm addresses its environmental and social challenges can have significant financial implications. To the extent that these disclosures reveal a firm’s current environmental and social performance as well as its future potential, investors can gauge how well the firm is currently managing its environmental and social risks, and how well it is equipped to tackle these in the future. Based on such arguments, some studies have examined the link between a firm’s environmental disclosures and its market performance (e.g., Freedman and Patten, 2004; Lorraine et al., 2004; Shane and Spicer, 1983; Stevens, 1984). All of these studies find a negative stock market response to release of environmental information.

The findings of the aforementioned studies however, are quite contrary to the expectations based on voluntary disclosure theory (Verrecchia, 1983) that higher and better quality environmental (and social) disclosures should help reduce information asymmetry between the firm and its investors (Al-Tuwaijri et al., 2004; Brammer and Pavelin, 2008). Results of the recent work in this area however, have been more in line with this theoretical reasoning. For example, Cormier et al. (2011) find that environmental and social disclosures help reduce the information asymmetry (as measured by the stock’s bid-ask spread and its share price volatility) between the firm and its investors. Hence, it can be argued that higher and better quality environmental and social disclosures can be a reflection of superior environmental and social performance (Verrecchia, 1983), can help lower the information asymmetry between a firm and its investors, and by implication lower its firm risk. Thus such disclosures would be

associated with higher market values of such firms. Accordingly, in this thesis, I extend Cormier et al.'s (2011) analysis by examining the link between a firm's environmental and social disclosures and its market value. It is important to mention here the findings on the relation between corporate environmental and social disclosures and firm environmental and social performance. Prior studies on this topic find mixed results. For example, consistent with the legitimacy perspective, Patten (2002a) finds a negative link, while consistent with the economics based voluntary disclosure theory, Clarkson et al. (2008) find a positive relationship between the two sets of variables. In this thesis, I further test this link by using environmental and social disclosure scores and two different environmental and social performance measures, namely carbon eco-efficiency and employee productivity respectively. The findings of a positive association between the two sets of variables lend further support to the economics based voluntary disclosure theory argument.

The roles of governance (such as board attributes) and CSR strategy have been rarely studied in the CSR field. Prior studies drawing on the management perspective, particularly the resource-based view of the firm, have studied the link between a firm's economic performance and its environmental performance (e.g., Al-Tuwaijri et al., 2004; Clarkson et al., 2011) assuming this link to be driven by the unobserved or indirectly measured CSR strategy. Moreover, from a corporate governance perspective, drawing particularly on the resource dependency theory, scholars have studied the link between a firm's board attributes and corporate social performance (Johnson and Greening, 1999; Mallin and Michelon, 2011).

While studies drawing on the management literature particularly the resource based view of the firm (Hart, 1995) hypothesise that superior managerial capabilities and superior CSR strategy translate into superior CSR performance, neither of these two explanatory variables, are explicitly accounted for in the research design. Nevertheless, these studies do acknowledge and control for the possible endogeneity between managerial capability, CSR strategy and CSR performance (e.g., Al-Tuwaijri et al., 2004; Clarkson et al., 2011). Studies from the corporate governance perspective, while acknowledging the strategy setting and advisory role of the board (as per resource dependency theory, Pfeffer and Salancik, 1978), neither explicitly consider the strategic decisions of

the board in this regard, nor control for the possible endogeneity of the link (e.g., Mallin and Michelon, 2011). In other words, prior literature on CSR from both management and corporate governance perspectives has tended to suffer from conceptual as well as methodological limitations. Hence, to date, no prior study takes a more integrated approach and studies the link between a firm's CSR related board attributes, its CSR strategy and its environmental and social performance. In this thesis, using a sample of UK firms included in the FTSE All-Share Index from 2002 to 2010, I investigate the relations among board attributes, CSR strategy and firm environmental and social performance. Using an aggregated measure of CSR strategy and a latent construct capturing board level CSR attributes, I explore the possible endogenous link between CSR related board attributes, board CSR strategy and firm environmental and social performance.

1.2 Research aim and objectives

Based on the preceding discussion, the objectives of this research are:

1. To investigate the relation between a firm's ESD and its operating profitability, as well as to investigate the potential causality regarding this link;
2. To examine the link between a firm's ESD and its market value, employee productivity and carbon eco-efficiency respectively;
3. To explore the relations among a firm's CSR related board attributes, CSR strategy and its environmental and social performance.

1.3 Structure of the thesis

This research is divided into seven chapters. Chapter 1 introduces the motivation and the relevant background to this study. Chapter 2 discusses relevant theoretical and regulatory frameworks about environmental and social responsibility, as well as introduces the environmental and social responsibility measures used in this thesis. Chapter 3 reviews existing empirical literature about the interrelationships among corporate social responsibility, corporate governance and financial performance, followed by three empirical studies including chapter 4, 5 and 6. The last chapter provides a conclusion of this thesis.

The three research objectives enumerated above, are studied through three empirical chapters (i.e., Chapter 4, 5 and 6). Chapter 4 investigates the determinants of a firm's ESD. The main research question of this empirical study is: is there an association between a firm's operating profitability and its ESD? If so, what is the direction of causality between a firm's operating profitability and its ESD? In this chapter, based on prior literature (e.g., Lee and Hutchison (2005) disclosure framework), I also control for a wide array of variables as determinants of ESD. Then using a pooled cross-sectional and time series data on FTSE 350 companies for most recent 5 years (2005-2009), I develop two sets of OLS regression models: one examines the relation between profitability and ESD, the other tests potential causality between operating profitability and ESD (i.e., Granger causality analysis). Finally, the robustness check further controls for the influence of governance disclosure on ESD.

Chapter 5 examines the link between a firm's ESD and its market value, and tests the relation between environmental (social) disclosure and environmental (social) performance. The research questions of this chapter are: first, is there an association between a firm's ESD and its market value? Second, is there any relationship between a firm's social disclosure and its employee productivity? Third, is there any association between a firm's environmental disclosure and its carbon eco-efficiency? Accordingly, three regression models are developed to test these three questions.

Chapter 6 investigates the relations among board attributes, firm CSR strategy and its environmental and social performance. This analysis draws on Hermalin and Weisbach (2003) theoretical framework, and develops a conceptual model to explore the possible endogenous links between board attributes, CSR strategy and firm environmental and social performance. Using a longitudinal dataset drawn from FTSE All Shares companies for nine years (2002-2010), structural equation modelling technique is used to examine these links.

Overall, this thesis makes a number of contributions to existing CSR studies. First, contrary to prior mixed results (e.g., Brammer and Pavelin, 2008; Clarkson et al., 2008; Ioannou and Serafeim, 2012); it finds a clear positive link between a firm's profitability and its environmental and social disclosures. It also establishes the direction of causality of this link, finding it to run from profitability

to disclosures. Second, it finds a clear positive link between a firm's environmental and social disclosures and its market value. It thus extends the work of Cormier et al. (2011) who find that such disclosures reduce information asymmetry between a firm and its investors, but who do not explicitly establish the link of such disclosures with firm market value. Third, as mentioned above, prior literature on CSR from both management (particularly the resource based view of the firm) and corporate governance perspectives has tended to suffer from conceptual as well as methodological limitations. This study takes a more holistic approach, develops and tests a theoretical model that incorporates board attributes and CSR strategy variables into the analysis of a firm's environmental and social performance. It methodologically and conceptually advances the management related stream of CSR literature, by explicitly measuring and incorporating in the research design variables that directly measure a firm's board level CSR orientation and its CSR strategy, linking these with the firm's environmental and social performance. The analysis thus helps advance the RBV-based CSR literature, by explicitly identifying the board level human resources and CSR strategies that can help firms achieve a competitive edge in the field of CSR. Furthermore, it contributes to the corporate governance related stream of CSR literature, by developing a theoretical model (adapted from Hermalin and Weisbach, 2003) which makes explicit the potentially endogenous links between board director attributes, firm CSR-related strategic decisions, and corporate environmental and social performance. It thus addresses two recent calls in this literature: first to address the issue of endogeneity in board-firm performance type analysis (Adams et al., 2010); and second, it responds to the recent call to conduct board attributes-conduct-performance type analysis (Johnson et al., 2013). The theoretical model developed in this thesis and its subsequent testing is among the first steps in addressing these calls.

Finally, contrary to prior studies the majority of which focus on environmental responsibility, this thesis investigates environmental and social responsibility separately. Cormier et al. (2011) call for a separate analysis of environmental and social responsibility measures in future research.

Chapter 2: Environmental and social responsibility: theoretical and regulatory frameworks

2.1 Introduction

While investors have traditionally focused solely on firms' financial performance, there is now growing interest in how firms perform on environmental and social issues. With the introduction of the Climate Change Act 2008¹, environmental and social responsibility has gained increased importance. UK has become the first country to introduce mandatory carbon reporting. According to (Papanicolaou et al., 2012),

“On 20 June 2012, the UK Deputy Prime Minister, Mr Nick Clegg, announced at the Rio +20 Summit that all companies listed on the Main Market of the London Stock Exchange will be required to report their annual levels of greenhouse gas ("GHG") emissions from the start of April 2013. The announcement, which will initially affect an estimated 1,100 companies, follows a public consultation on policy options undertaken during the course of 2011.” (Source: published on the Jones Day website 04 July, 2012)

Firms' environmental and social policies as well as their performance in this area in any given year are increasingly important for all classes of investors and essential for the growing socially responsible investment market, and for investments in firms that meet specified environmental and social criteria.

Moreover, the credit crisis has caused mainstream investors to become increasingly aware of firms' environmental and social impact as an important information source of insight into the long-term viability of their businesses. For example, mainstream investors have come to recognize the usefulness of environmental and social information as a proxy for evaluating firms' management quality and the ability of management to promote long-term firm sustainability. Investors are now able to pursue a more fundamental integration of environmental and social information into their financial analysis, given the greater availability of materially relevant environmental and social information at the key performance indicator level. In today's business climate, environmental

¹ The Climate Change Act 2008 sets a target for the UK to reduce carbon emissions to 80% below 1990 levels by 2050. It also set an interim target of a 34% reduction by 2020 (with the potential to increase this to a 42% cut given an international agreement) and established the concept of carbon budgets.

and social responsibility contributes to meeting environmental and social challenges as well as avoiding and/or meeting government regulations.

2.1.1 Definitions and background

The definition of environmental and social responsibility is complex and diverse, which is commonly referred to as corporate social responsibility (CSR) or at times as environment, social and governance (ESG) responsibility. *“As socially responsible investment has become more firmly established as one of the mainstream considerations in institutional investment, the terminology has broadened to include environmental, social and governance factors, referred to as ESG factors”*. (Solomon, 2007; p.272)

Commission of the European Communities (2002) defines corporate social responsibility as

“companies having responsibilities and taking actions beyond their legal obligations and economic/business aims. These wider responsibilities cover a range of areas but are frequently summed up as social and environmental – where social means society broadly defined, rather than simply social policy issues. This can be summed up as the triple bottom line approach: i.e. economic, social and environmental.” (p.5)

According to Dahlsrud’s (2008) study, the UK government (2001) states that corporate social responsibility

“recognizes that the private sector’s wider commercial interests require it to manage its impact on society and the environment in the widest sense. This requires it to establish an appropriate dialogue or partnership with relevant stakeholders, be they employees, customers, investors, suppliers or communities. CSR goes beyond legal obligations, involving voluntary, private sector-led engagement, which reflects the priorities and characteristics of each business, as well as sectoral and local factors.” (p.10)

With the development of stakeholder theory, CSR is the concept used to refer to the responsibility of a corporation towards all relevant stakeholders.

The term ESG appears in the United Nations Principles of Responsible Investment (UNPRI) and is also employed by major business consulting firms. The terminology is employed in various contexts – risk valuation, socially responsible investment, corporate responsibility etc. It has been used as a generic term in capital markets in recent years.

The definitions show that environmental and social responsibility is not new at a conceptual level; business has always had environmental and social impacts, been concerned with stakeholders - government, customers or owners, and dealt with regulations. Hence, in this thesis, CSR and ESG refer interchangeably to a firm's environmental and social responsibility.

2.1.2 Difference and linkage between environmental and social

disclosures (ESD) and environmental and social performance (ESP)

Environmental and social responsibility encompasses both environmental and social disclosures (ESD) and environmental and social performance (ESP), which will be studied separately in this thesis. Many prior studies fail to differentiate ESD from ESP. Therefore, it is important to point out the difference between ESD and ESP. ESD stands for disclosures collected from firms' reports e.g., sustainability report, annual report, website etc. For instance, previous researchers use annual reports to measure ESD, including Business Review, Operating and Financial Review and other 10K reports (e.g., Ingram and Frazier, 1980; Wiseman, 1982; Gray, 1995; Patten, 2002a; Deegan et al., 2002; Campbell, 2003; Henriques, 2010). ESP refers to firms' actual environmental and social performance such as Toxic Release Inventory (TRI) data, carbon emission, water usage, employee CSR training and community contribution etc. (Al-Tuwaijri et al., 2004; Clarkson et al., 2008).

However, there is a significant linkage between ESD and ESP. On the one hand, it can be argued that firms doing 'good' should be willing to provide more 'green' information (Clarkson et al., 2008). On the other hand, it can also be argued that poor environmental or social performers may tend to provide more information for gaining legitimacy (Patten, 2002a). Hence, drawing upon the economics based voluntary disclosure theory, one can argue that firms with good environmental and social performance should be willing to provide more ESD, which is difficult for poor firms to mimic. From socio-political theories, firms with poor environmental and social performance should tend to provide more ESD to meet external environmental and social challenges such as legitimacy pressure. Both types of theories will be discussed further in the next section.

Empirically, Clarkson et al. (2008) drawing on both economics based voluntary disclosure theory and socio-political theories, investigate the relation between firms' environmental performance and environmental disclosure. Environmental disclosure data is collected from firms' sustainability reports or websites. A refined disclosure index is developed based on GRI guidelines published in 2002. They focus on purely discretionary disclosure (i.e., data is collected from voluntary disclosure sources such as sustainability reports or websites), which is helpful in analysing the propensity and quality of voluntary disclosure. Environmental performance is measured by the total toxic waste that is treated, recycled or processed as a percentage of the total toxic waste generated by each firm (% recycled) and the ratio of TRI to firm sales. Clarkson et al. (2008) predict either a positive association between environmental performance and the level of discretionary environmental disclosure as per voluntary disclosure theory, or a negative association as implied by the socio-political theories. Their findings support economics based voluntary disclosure theory. In other words, they find that firms with better environmental performance tend to disclose more voluntary environmental information, which is difficult for poor firms to mimic (i.e., differentiate their firm types).

Patten (2002a) examines the relationship between environmental disclosure and environmental performance for a sample of 131 US companies. Environmental disclosure is based on firms' annual reports in 1990 (i.e., content analysis of 8 indicators and also report line counts). Environmental performance is measured as the ratio of a firm's specific amount of toxics released to revenue (both data are for the year 1988). After controlling for firm size and industry classification, Patten finds a negative and significant link between environmental disclosure and environmental performance.

In this thesis, Chapter 4 examines ESD and firm profitability; Chapter 5 examines ESD and firm market value, employee productivity and carbon eco-efficiency respectively; and Chapter 6 investigates the link between board CSR attributes, CSR strategy and firm ESP. I use Bloomberg environmental and social scores to measure firms' environmental and social disclosures, and adopt Asset4 environmental and social scores to measure firms' environmental and social performance. Detailed explanation about these two datasets is provided at the end of this chapter.

2.2 Voluntary ESD

Current economic recession has underscored the need for companies to become more transparent in terms of providing both financial and non-financial disclosures. Thus, environmental and social disclosures have become part of companies' governance to control and manage potential risk such as regulatory risk related to environmental fines.

Environmental and social information from a firm addresses several stakeholder groups, not just investors and financial analysts. There are different users of environmental and social reports such as investors, regulators and competitors etc. Voluntary ESD enables users to better understand and communicate with firms. For example, Solomon (2007) states that *“for environmental reporting, the United Nations Environment Programme identified the following user groups: employees, legislators and regulators, local communities, investors, suppliers, customers and consumers, industry associations, environment groups, science and education, and the media”* (p.246). Environmental reports enable regulators to know firms' environmental impact and can thus help make future environmental policy. Thus ESD should address a wide array of user groups – a variety of stakeholders. Furthermore, firms that issue environmental and social reports are expected to gain from meeting investors' demands, from cost savings and from building a broad-based corporate reputation (Dowling, 2004). Thus it can be seen that investors appear to be an important user group of environmental and social information, and ESD could be a communication channel between firms and their (largely institutional) investors.

In the following section, first, general voluntary disclosure theory is introduced, followed by relevant theoretical frameworks underlying ESD. Then ESD drivers, challenges and recommendations are reviewed.

2.2.1 General voluntary disclosure theory

Firms provide mandatory disclosure through regulated financial reports such as financial statements, which is compulsory for all UK companies. Some firms engage in voluntary communication such as analysts meetings, sustainability reports and internet sites etc. Gibbins et al. (1992) argue organisations may disclose information to support the efficiency of exchange and production, but they also disclose information to establish their compliance with the social

values in regulations and informal norms. Reporting and disclosure are among the most important tools used by companies to communicate with their stakeholders and diminish information asymmetry between them.

Voluntary disclosure refers to information made public through a firm's free choice. It could be affected by culture, social, economic or behavioural factors that are specific to each firm. There is no general accepted definition for voluntary disclosure. Francis et al. (2008) state that,

“The primary insight from theoretical work is that managers disclose their private information because rational market participants would otherwise interpret nondisclosure as unfavorable news and consequently discount the value of the firm's assets (see Grossman and Hart [1980], Milgrom [1981], Verrecchia [1983, 2001]). The manager's disclosure mitigates the adverse selection problem in capital markets by reducing information asymmetry between the firm and investors, enabling greater liquidity and lowering the firm's cost of capital (Glosten and Milgrom [1985], Diamond and Verrecchia [1991])”. (p.56)

Furthermore, Tian and Chen (2009) state that,

“Compulsory information disclosure means relevant laws and rules, such as Company Law, Securities Law, Accounting Rules, and regulatory agencies' regulations, clearly regulate that listed companies must actualize information disclosure. Voluntary disclosure means, except for compulsory disclosure, listed companies disclose information voluntarily for the sake of companies' images, investors, and accusation risks avoidance”. (p.55)

Voluntary disclosures can include strategic information such as company characteristics and strategy, and nonfinancial information such as socially responsible practices. Thus voluntary disclosure represents the excess of information that depends on the free choice of management decision and outside market factors.

Costs and benefits analysis

Managers of companies provide voluntary information which they consider is useful for stakeholders' needs. In other words, the voluntary disclosure is considered by managers to be incremental information or serves other purposes that benefit the company. Voluntary disclosure can benefit investors and firms. It reduces information asymmetry and helps investors make better capital allocation decisions. Furthermore, voluntary disclosure may enhance a firm's

credibility, based on the perception that cost of the information released is a sufficient condition to assure the firm's credibility. In addition, voluntary environmental and social disclosures could act as a signal of ethical and trustworthy corporate governance. Stakeholders believe these firms not only have integrity but also competent managers. In short, the potential benefits of voluntary environmental and social information can be the increase of share value and investor numbers; improvement of the access to capital market and the relations with external stakeholders; and the reduction of share volatility and information asymmetry.

However, providing voluntary information may decrease competitive advantage, and it is costly to provide information voluntarily. Voluntary information may affect the competitive advantage of firms, because voluntary information may enable competitors to value/position a firm, especially for the same industry. Moreover, voluntary disclosure implies additional costs to companies including both real and opportunity costs. From an accounting and economics perspective, production and distribution of voluntary environmental and social information entails costs, even if it is likely to confer benefits (Verrecchia, 1983). For example, Brammer and Pavelin (2008) suggest that there are two types of costs involved in making disclosures: *the costs of measuring, verifying, collating and publishing environmental (and social) information; and the loss of strategic discretion associated with making public commitments to verifiable future actions and/or performance* (p.122).

Hence, it is important for firms to balance the benefits of voluntary disclosure against the costs. If benefits exceed costs either in the short or long term (depending on the managers' purpose), then they will choose to disclose information voluntarily.

It is worth mentioning the proprietary costs theory. Proprietary information is defined by Dye (1985) as

“any information whose disclosure potentially alters a firm's future earnings gross of senior management's compensation... This includes information whose disclosure could generate regulatory action, create potential legal liabilities, reduce consumer demand for its products, induce labor unions or other suppliers to renegotiate contracts, or cause revisions in the firm's credit standing in addition

to that information which is, in the traditional sense, strategically valuable.” (p.123)

Dye (1985) also proposes in the discussion that all market participants share the common belief that the private information contemplated to be released by the firm being studied is non-proprietary. Under the proprietary costs theory, Dye (1985) shows that nondisclosure or partial disclosure can be optimal option for companies even if credible information is available.

The proprietary costs theory (Verrecchia, 1983; Dye, 1985) suggests that companies should be fully transparent if there are no costs to be transparent. However, empirical studies show there is variation in disclosure quality (Beyer et al., 2010), implying it is important to balance the tension between the costs and benefits of disclosure. An explanation can be that there are proprietary costs to disclosure which are driven by rent-extracting from stakeholders such as competitors and suppliers etc.

2.2.2 Theoretical frameworks underlying ESD

Existing literature suggests that there is no unifying theoretical framework explaining voluntary ESD. Some earlier studies point to the lack of a testable theory (Ingram and Frazier, 1980; Wiseman, 1982) related to motivation for such disclosures. More recent studies suggest that there are a few theoretical frameworks that could explain firms' voluntary ESD.

One stream of existing literature uses legitimacy or political economy theories to explain firms' environmental or social disclosures (Gray, 1995; Patten, 2002a; Deegan, 2002; Campbell, 2003; Cho and Patten, 2007). These so called socio-political theories argue that firms with the worse public image tend to disclose more environmental and social information. In other words, poor performers who face more political and social pressure and threatened legitimacy, attempt to increase discretionary ESD to change stakeholders' perceptions about their actual performance. The socio-political theories tend to emphasize external contextual factors (such as media visibility) and corporate characteristics (such as industry and size) to determine E or S disclosure.

The other stream of studies attempts to use economics based theories to explain firms' environmental and social disclosures, such as agency theory or economic costs and benefits analysis (Cormier et al., 2011; Clarkson et al.,

2008). According to economics based theories, firms with better financial/non-financial performance should disclose more environmental and social information. These firms should attempt to convey their firm types through voluntary ESD which would be difficult for poor firms to mimic. Economics based theorists place more emphasis on firms' financial characteristics such as market performance, operating financial performance, and economic costs (i.e., costs and benefits analysis) to determine the motive for environmental and social activities.

However, according to Hershcovis et al. (2009),

“...while the socio-political theorists more often present sustainability reporting as non-credible, the economic perspective suggests that disclosure decisions are based on a cost-benefit assessment, not necessarily to manage impressions for the stakeholders. Although most research has argued for either one theory or the other, the reality may be a combination of both, which is rooted in the learning curve of preparers and internal processes of organizations” (p.9).

Hershcovis et al.'s (2009) argument indicates that the learning curve of preparers and internal processes such as internal corporate governance matter, and there is not necessarily one theory to explain corporate environmental and social disclosures. Indeed, the findings regarding the determinants of ESD indicate that both types of theories could work together. For example, economics based theories can explain the influences of profitability, while socio-political theories tend to explain media exposure and industry effects. Some relevant theoretical frameworks of both categories, namely socio-political theories and economics based disclosure theories are reviewed in the following sections.

Socio-political theories

2.2.2.1 Legitimacy theory

Legitimacy theory has become increasingly used by accounting researchers in the last decade, particularly researchers working in the area of environmental and social accounting to explain ESD (Patten, 1992; Gray et al., 1995; Deegan and Rankin, 1996). For example, the theory has been used to explain voluntary disclosures made within annual reports or sustainability reports. The following section will describe the notion of 'social contract' and 'legitimacy theory' used to explain ESD.

Legitimacy theory is centred on the notion of a 'social contract'. Social contract refers to a contractual relationship between organisations and society. The existence of this contract ensures business to perform various socially desired actions in return for approval of its objectives, other rewards and ultimate survival. Failure to comply with societal expectations (in essence, to comply with the terms of the social contract) may lead to sanctions being imposed by society (Deegan and Unerman, 2006; p.271). However, different managers will have different perceptions about the terms of the social contract, and hence they will adopt different strategies to ensure firms' operations are acceptable to various stakeholders.

The concept of legitimacy is central to legitimacy theory. Legitimacy is defined by Suchman (1995) as "*a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions* (p.574)." Legitimacy theory is described as a positive theory (Deegan, 2006), as it seeks to explain firms' behaviour in terms of efforts made to appear legitimate, rather than prescribing how firms should behave (which is the role of a normative theory of corporate conduct). When a firm's performance threatens its legitimacy, it will lead to economic (e.g., limited provision of financial capital), legal (e.g., lawsuits) or social (e.g., publicity campaigns) action.

Legitimacy theory implies a reactive or proactive approach of companies to provide voluntary ESD. On the one hand, firms can voluntarily disclose any positive environmental and social information to inform stakeholders about their intentions to improve their environmental and social performance. On the other hand, when firms' environmental and social activities threaten their legitimacy, they can provide extra environmental and social information to influence stakeholders' perceptions about their negative performance without changing actual behaviour. Legitimising strategies might also occur at an industry level. That is, if an entire industry has a crisis of legitimacy it might be efficient for a centralised industry body to undertake activities that bring some legitimacy to the industry as a whole (Deegan, 2006).

Legitimacy theory originates from political economy theory (Deegan, 2006) that will be discussed in the next few paragraphs.

2.2.2.2 Political economy theory

Gray et al. (1996) state political economy theory is “*the social, political and economic framework within which human life takes place*” (p.47). Political economy theory has been divided into two broad streams by Gray et al. (1996) – ‘classical’ and ‘bourgeois’ political economy. Classical political economy theory tends to explain disclosures as being a tool by which powerful individuals maintain their own ‘favoured’ positions to the detriment of those individuals without power. Bourgeois political economy theory is content to perceive the world as essentially pluralistic. Legitimacy theory is embedded in the ‘bourgeois’ branch of political economy theory, which assumes that many classes of stakeholders have the power to affect various decisions by companies, government and other entities. Empirically, Gray et al. (1995) conduct a longitudinal study about corporate social disclosure in the UK, using the CSEAR social disclosure database for the period covering 1988-1995. The data reported is collected by using content analysis of UK firms’ annual reports. However, due to time and labour constraints, the database was collected only up to year 1995. Gray et al. (1995) review relevant literature about corporate social reporting and investigate the trends of social disclosure in the UK. They argue that political economy, legitimacy theory and stakeholder theory need not be competitor theories but may be seen as alternative and mutually enriching theories from alternative levels of resolution. By using the bourgeois political economy theory, the findings indicate a significant change in social disclosure behaviour throughout the period. Overall, “*the theoretical perspectives prove to offer different, but mutually enhancing, interpretations of these phenomena*” (Gray et al. 1995).

According to Deegan and Unerman (2006),

“political economy theory explicitly recognises the power conflicts that exist within society and the various struggles that occur between various groups within society. The perspective embraced in political economy theory and also legitimacy theory, is that society, politics and economics are inseparable and economic issues cannot meaningfully be investigated in the absence of considerations about the political, social and institutional framework in which the economic activity takes place.” (p.269)

Solomon (2007) posits that from a corporate environmental reporting perspective,

“political economy theory focuses on power and conflict in society, the specific historical/institutional environment of the society in which it operates and the acknowledgement that corporate environmental reporting can reflect different views and concerns”. (p.242)

Hence, based on political economy theory, environmental and social reports can “*serve as a tool for constructing, sustaining and legitimising economic and political arrangements, institutions, and ideological themes which contribute to the corporation’s private interests. Disclosures have the capacity to transmit social, political, and economic meanings for a pluralistic set of reporting recipients*” (Guthrie and Parker, 1989; p.166).

Economics based voluntary disclosure theories

2.2.2.3 Agency theory

Jensen and Meckling (1976) define the principal-agent relationship as “*a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent*” (p.308). In the agency framework, managers are the agent and shareholders are the principal. According to Jensen and Meckling (1976), the basic principal-agent relationship is confronted with a fundamental issue – the agency problem. That is, the agent may not act in the best interests of the principal. Furthermore, the agency problem is seen to exacerbate under conditions of information asymmetry. Cormier et al. (2011) posit that more environmental or social disclosure leads to less information asymmetry between a firm and its investors, thus lowering firm risk. Hence, shareholders seek to control managers’ behaviour through bonding costs and monitoring activities (Jensen and Meckling, 1976). Under agency theory, voluntary disclosure can be seen as one of the bonding costs incurred on the part of managers to minimize their agency costs (Jensen and Meckling, 1976). Managers may show shareholders that they are acting optimally through voluntary disclosure (Jensen and Meckling, 1976).

It is worth mentioning that some theories can be applied to both ESD and ESP. For example, from an information asymmetry perspective, agency theory can be used to explain ESD, while from an over and under investment point of view, agency theory is more relevant to ESP, which will be explained in the next paragraph.

Friedman (1970) posits that engaging in CSR is symptomatic of an agency problem or a conflict between the interests of managers and shareholders. He argues that managers can use CSR as a means to pursue their own social, political, or career agendas at the expense of shareholders. Based on this argument, Barnea and Rubin (2006) state that if CSR expenditure reduces firm value, then a negative relation between CSR expenditure and insider ownership is expected. They argue that a firm's insiders (corporate managers, directors and large blockholders) may have an incentive to increase CSR expenditure to a level that is higher than that which maximizes firm value if they gain private benefits (e.g., enhance their reputation for respecting their employees, communities and the environment) from a high CSR rating. Hence, CSR may create a conflict between different shareholders. They also argue that a firm with high debt levels will be more difficult for insiders to over-invest in CSR, as they have less cash available. Barnea and Rubin (2006) use a sample of large US companies to examine the relation between firms' CSR performance ratings and their ownership and capital structures. The dependent variable is CSR rating of each firm, and key independent variables are insider ownership, institutional ownership and leverage. Consistent with their expectation, they find that CSR performance can create a conflict between different shareholders, and find insider ownership and leverage are negatively related to a firm's social rating, while institutional ownership is uncorrelated with it. They explain that "*at high ownership levels, the cost to insiders of increasing CSR expenditure (which yields a higher CSR rating) is larger than the related benefits. In other words, insiders downplay the importance of their private benefits compared to firm value because they own more of the firm. Thus, the negative relation suggests that the cost incorporated in CSR is significant*" (p.16). Furthermore, the negative correlation between leverage and CSR also supports the CSR-conflict hypothesis, as higher leverage makes firms spend less on CSR.

Recently, Jo and Harjoto (2012) investigate the relation between CSR performance and corporate financial performance (CFP) and examine the relative importance of stakeholder theory and agency theory by using a large sample of US companies during the period from 1993 to 2004. They propose two hypotheses, namely the overinvestment hypothesis based on agency theory and the conflict resolution hypothesis based on stakeholder theory. In

other words, agency theory-based overinvestment hypothesis indicates that CSR engagements are costly activities and a waste of scarce resources, and therefore have an adverse impact on firm value. However, stakeholder theory-based conflict-resolution explanation predicts that the firm value of socially responsible firms engaging in CSR activities is higher than that of socially irresponsible firms ignoring CSR activities, because CSR engagement reduces conflict of interest between managers and non-investing stakeholders. This implies firms still under-invest in CSR activities and that the financial market values investment in CSR activities.

As mentioned above, from the overinvestment perspective, Barnea and Rubin (2010) argue that CSR engagement may cause a principal-agent problem. Affiliated insiders may have an interest in overinvesting in CSR, if doing so provides private benefits such as enhancing their reputation as good social citizens. However, from the conflict resolution perspective, stakeholder theory indicates that managers conduct CSR to fulfil their moral, ethical, and social duties for their stakeholders and strategically achieve corporate goals for their shareholders. After correcting for endogeneity bias, Jo and Harjoto (2012) find that CSR engagement positively influences CFP, which supports the conflict-resolution hypothesis based on stakeholder theory rather than the CSR overinvestment argument based on agency theory. In addition, they find that firms' CSR engagement with the community, environment, diversity, and employees plays a significantly positive role in enhancing CFP.

2.2.3 Drivers of ESD

Solomon and Lewis (2002) suggest that markets, social, political and accountability factors are the main sources of incentives for environmental and social reporting. They summarize the incentives to disclose as: to improve the company's image; to market the company and its products; to comply with regulations; to manage pressure from customers and peer companies in the same industry; to attract investment; to meet the demand for environmental information; to acknowledge social responsibility; as a form of political lobbying, as an acceptance of change in society's ethics and a result of company ethics. According to them, costs of disclosure, lack of awareness of environmental issues, and avoiding providing information to competitors are main reasons for not disclosing.

Maximiano (2007) conducts a survey of CSR completed by members of the Philippines Chamber of Commerce and Industry and a focus group discussion of CSR experts. Based on the feedback from CSR experts, respondents perceive the motivation to apply CSR disclosure is consumers' demand. This implies that the public expects firms to be ethical and socially responsible, thus public expectation is a key driver that motivates firms to practice and institutionalize their CSR. According to Maximiano (2007), this is followed by the improvement of firms' reputation and image. Managerial and personal values rank the third, part of business strategy ranks the fourth, community demand is the fifth, and recruitment and retention of employees rank the sixth. Compliance with regulations and laws appears to be a motivator that drives firms to institutionalize their CSR. However, according to Maximiano (2007), it seems that regulatory compliance is the least of all enumerated drivers. As 166 business executives say that businesses should institutionalize CSR, which means going beyond compliance with laws and regulations.

2.2.4 ESD challenges and recommendations

For researchers, there are some challenges to measuring the quality of voluntary ESD. First, given the absence of clear mandatory guidelines as to what firms should report in terms of their environmental and social responsibility, how studies measure ESD varies greatly. Second, even though there are some reporting frameworks such as GRI guidelines; it is difficult to quantify key performance indicators to ensure that these are comparable between firms and industries. Bloomberg disclosure scores used in this thesis, provide a comprehensive ESD measure with comparable and quantifiable indicators. These will be discussed in detail at the end of this chapter.

In the way of suggestions for improving the quality of disclosures, Jones (2010) makes some recommendations for firms and their accountants in relation to environmental reporting. First, Jones (2010) suggests that managers and accountants should take immediate action to address their environmental threats. Second, they should use new environmental accounting systems to measure, capture and disclose corporate environmental impacts. Third, explore alternative monetary and non-monetary valuation systems. Finally, companies should disclose their environmental performance or activities to their stakeholders. Building on prior literature, Jones also develops a multilayered

theoretical model (eight premises) with respect to environmental accounting and reporting. Based on the theoretical model, Jones posits that firms should report their environmental accounting to their stakeholders because of the stewardship function of the boards. Overall, it appears that self-regulated voluntary approach might be suitable, when the market is still 'learning' the merits of environmental and social responsibility.

2.3 ESP

In this section, theories underlying ESP are reviewed, followed by the discussion of ESP importance.

2.3.1 Theoretical frameworks underlying ESP

2.3.1.1 Stakeholder theory

The most dominant theory used by existing CSR studies is stakeholder theory. Freeman (1984) asserts that firms have relationships with different stakeholders who both affect and are affected by the actions of the firm. He defines a 'stakeholder' as "*any identifiable group or individual who can affect the achievement of an organisation's objectives, or is affected by the achievement of an organisation's objectives*" (p.46). In accordance with this paradigm, stakeholders include customers, suppliers, employees, communities, and the general public, besides managers, stockholders and creditors. Freeman (1984) suggests that managers should understand a firm's rationale, the organisational process used to manage relationships with stakeholders, and the set of transactions that takes place among the organizations and their stakeholders. Freeman's (1984) stakeholder theory states that firms should use CSR as an extension of effective corporate governance mechanisms to resolve conflicts between managers and non-investing stakeholders.

Comparing with the shareholder theory that focuses on the shareholder primacy (Friedman, 1970); stakeholder theory posits firms are accountable to all stakeholders, not just their shareholders. Shareholders provide capital and bear residual risk; a firm should remain accountable to its shareholders through its management structure for maximising shareholders wealth. The accountability relationship towards shareholders is termed as 'fiduciary duty' under directors' responsibility of Companies Act 2006. However, it can also be argued that when 'Enron' collapsed, it was not only the shareholders but also every one of the

stakeholders suffered. Each of the stakeholders is compensated on the basis of agreements (e.g., employees are compensated through salary, and other suppliers of capital through return of their capital with interests), but they have a legitimate or moral right to claim on the value created by the firm.

As mentioned in section 2.2.2.4, Jo and Harjoto (2012) investigate the relation between CSR performance and corporate financial performance (CFP) and examine the relative importance of stakeholder theory and agency theory. After correcting for endogeneity bias, they find that CSR engagement positively influences CFP, which supports the conflict-resolution hypothesis based on stakeholder theory rather than the CSR overinvestment argument based on agency theory.

The instrumental aspect of stakeholder theory explains the relationships between stakeholder management practices and corporate performance. The instrumental stakeholder theory suggests a positive relationship between ESP and financial performance, and the satisfaction of various stakeholder groups is instrumental for organisational financial performance.

Enlightened shareholder theory

According to Solomon and Solomon (2004), stakeholder-agency theory so called enlightened shareholder theory² argues that the implicit and explicit negotiation and contracting processes entailed by stakeholder–management relationships serve as monitoring and enforcement mechanisms that prevent managers from diverting attention from broad organisational financial goals. Furthermore, according to Orlitzky et al. (2003),

“by addressing and balancing the claims of multiple stakeholders (Freeman and Evan 1990), managers can increase the efficiency of their ’s adaptation to external demands. Additionally, according to a firm-as-contract analysis (Freeman and Evan 1990), high corporate performance results not only from the separate satisfaction of bilateral relationships (Hill and Jones 1992), but also from the simultaneous coordination and prioritization of multilateral stakeholder interests.” (p.405)

² There is a gradual broadening of the corporate governance agenda, characterized by a move away from a narrow agency theory view toward a broader, stakeholder-oriented view that embraces concepts of corporate social responsibility and sustainability. (Solomon and Solomon, 2004)

Enlightened stakeholder theory

Enlightened stakeholder theory argues that stakeholder theory should not be viewed as a legitimate contender to value maximization, because it fails to provide a complete specification of a firm's purpose. According to Jensen (2010),

"...enlightened stakeholder theory, while focusing attention on meeting the demands of all important corporate constituencies, specifies long-term value maximization as the firm's objective." (p.33)

"It can make use of most of what stakeholder theorists offer in the way of processes and audits to measure and evaluate the firm's management of its relations with all important constituencies. Enlightened stakeholder theory adds the simple specification that the objectives function—the overriding goal—of the firm is to maximize total long-term firm market value." (p.39).

Furthermore, Jensen (2010) argues in order to maximize a firm's market value, managers who play a critical role in leading and sustaining the firm's strategic vision, must not only satisfy, but also enlist the support of all corporate stakeholders. He states that enlightened stakeholder theory adds the simple specification of a firm's objective function (i.e., to maximize total long-term firm market value), which differentiates from the (multi-objective) stakeholder theory as proposed by Freeman (1984). "Stakeholder theory gives them *the appearance of legitimate political access to the sources of decision-making power in organizations, and it deprives those organizations of a principled basis for rejecting those claims*" (Jensen 2010, p.42). In other words, it can be used by managers to seek personal interests. However, enlightened stakeholder theory enables management to assess the tradeoffs among its stakeholders, which solves the problems arising from stakeholder theory.

It is necessary to point out the difference between the enlightened stakeholder theory and the enlightened shareholder theory. Enlightened shareholder theory would ultimately attribute priority to shareholders' interests, but also encourage firms to balance short-term loss against longer-term business success (Macve and Chen, 2010). However, the enlightened stakeholder theory focuses on the firm's objective, which is to maximize total long-term firm market value. Therefore, enlightened shareholder theory reflects an updating rather than a replacement of the traditional view of the corporation as an instrument for

delegating to managers (as 'agents') the responsibility for maximising the wealth of shareholders' (as 'principals') (Macve and Chen, 2010).

2.3.1.2 Resource based view of the firm (RBV)

It is necessary to mention the resource based view of the firm (RBV). The RBV theory is widely used in strategic management literature and is a basis for explaining the competitive advantages of a firm (Penrose, 1959). To transform a short-run competitive advantage into a sustained competitive advantage requires the resources to be valuable, rare, inimitable and non-substitutable. The 'resources' can be divided into resources and capabilities: resources are tradable and non-specific to the firm, but capabilities are firm-specific and are used to engage the resources within the firm, such as implicit processes to transfer knowledge within the firm (Makadok, 2001).

Penrose (1959)³ considers a close relation to exist between the availability of resources to a firm and the development of innovative ideas and strategies by its managers, while Bourgeois (1981) considers slack to be a resource cushion that firms can use in a discretionary manner, both to counter threats and exploit opportunities. The resource-based view of the firm proposes that valuable, costly to copy firm resources and capabilities provide the key sources of a sustainable competitive advantage (Barney and Arkan, 2005). In other words, only firms with resources and capabilities that are not easily duplicated by competitors can have a competitive advantage. Resources can be physical, financial and firm-specific assets such as superior managerial or employees' skills and internal processes, and capabilities including the ability to accomplish specific value-added tasks with development of supporting resources.

The RBV theory can be used to explain ESP. Firms with financial resources and unique managerial capabilities, as manifested in superior environmental strategies (as argued by Clarkson et al. 2011) are able to gain competitive advantage. First to apply RBV theory to explain competitive advantages in environmental responsibility is Hart (1995). Hart (1995) theorized that proactive investments in environmental strategies including pollution prevention and product stewardship could confer both environmental and economic benefits to firms such as improving manufacturing efficiency, enhancing reputation and

³ Penrose (1956) states that excess resources are important determinants of organisational structure, growth, and performance.

raising rival's costs. Hart (1995, p.999) also emphasized the importance of communicating these environmental strategies to external stakeholders, as these could “.....reinforce and differentiate a firm's position through the positive effects of a good reputation.” Furthermore, Russo and Fouts (1997) empirically tested the predictions of RBV, and found a positive link between environmental performance and firm operating profitability. They assumed this link to be mediated by the unobserved superior environmental strategy which they conjectured to be based on unique combinations of intangible (such as human, reputation, technology), and tangible (such as financial reserves and physical equipment) assets. The RBV theory has also been applied by more recent studies including those of Al-Tuwaijri *et al.* (2004) and Clarkson *et al.* (2011) both of whom argue that the reason for their finding of a positive link between a firm's environmental and financial performance is the unobserved capabilities particularly managerial quality and CSR strategy.

2.3.1.3 Resource dependence theory (RDT)

According to Hillman *et al.* (2009), resource dependence theory is one of the most influential theories in organisational theory and strategic management, which recognizes the influence of external factors on organisational behaviour. Although constrained by their context, managers can act to reduce environmental uncertainty and dependence by providing essential resources to a firm or by helping the firm secure these resources through linkages with its external environment. RDT has been applied in corporate governance literature, particularly in studies related to board of directors. Pfeffer and Salancik (1978) suggest five actions that firms can take to minimize environmental dependences: 1) mergers/vertical integration, 2) joint ventures and other inter-organisational relationships, 3) appropriate selection of members of boards of directors, 4) political action, and 5) executive succession. Boards of directors can be a solution to reduce external uncertainty including that posed by environmental and social challenges. Furthermore, Pfeffer and Salancik (1978) suggest that directors can bring four benefits to organisations: 1) information in the form of advice and counsel, 2) access to channels of information between the firm and environmental contingencies, 3) preferential access to resources, and 4) legitimacy.

Based on the RDT theory, Mallin and Michelon (2011) argue that board of directors can bring in four benefits to a firm: advice and counselling; legitimacy; channels for communicating information between external organisations and the firm and preferential access to commitments or support from important stakeholders in the firm's environment. Hence, directors can provide critical resources to reduce external uncertainty, as well as can be seen as a mechanism of legitimacy and reputation. In their analysis, board reputation is captured by board composition, competence, diversity, leadership, structure and links with the external environment. Based on these arguments, they find that the proportions of independent, community influential and female directors are positively linked with corporate social performance, while the presence of a corporate social responsibility committee is positively associated with community performance. In addition, they find that CEO duality and community influential directors with multiple directorships have a negative effect on corporate social performance of the 100 Best Corporate Citizens.

Hillman et al. (2009) posit that RDT can be integrated with other theoretical perspectives to examine the phenomenon of interest. They point out that several similarities exist between RDT and stakeholder theory, which both recognize the firm's interdependence on external and internal contingencies. Hillman et al. (2009) state perhaps combining RDT recognition of the multiplexity of dependencies with the insights from stakeholder theory would yield greater insights for managing dependencies and the specific strategies to do so. From the stakeholder and legitimacy perspective, the board of directors can be seen as a mechanism of legitimacy and reputation, since its role is to ensure the company is run efficiently and stakeholders' interests are taken into consideration in top management's decision making (Michelon and Parbonetti, 2010). From the resource dependency perspective, the board of directors can provide critical resources to a firm and enables the firm to minimize its dependence or gain resources from external environmental (Pfeffer, 1972). In other words, the board of directors according to RDT theory can be a solution to external challenges including CSR challenges that a firm faces in the market in which it operates.

To sum up, in this thesis I draw on a number of different theories to support different aspects of my empirical analyses as appropriate. The first empirical

chapter (i.e., Chapter 4) focuses on the economics based costs and benefits analysis to examine the link between operating profitability and ESD. In the second empirical chapter (i.e., Chapter 5), agency theory and the ensuing information asymmetry problem, is used as the basis to investigate the relation between ESD and market value of the firm. In the last empirical study (i.e., Chapter 6), RBV and RDT theories are adopted to explore the influences of board attributes and CSR strategy on a firm's ESP.

2.3.2 Importance of ESP

Solomon and Solomon (2004) note that it seems increasingly likely that creating value for stakeholders by businesses focusing attention on maximizing value for local communities, employees and environmental impacts, may be synonymous with creating financial value for shareholders. Ignoring the needs of stakeholders can lead to lower financial performance and even corporate failure. Performance of a firm on its environmental and social challenges has now become very important. It can affect a company's overall performance and risk profile. A study by EIRIS (2009) shows that environmental and social performance enables investors to understand corporate governance and risk management of the firms in which they invest, and ensures capital flows to be directed towards better-managed firms. ESP can potentially reflect a firm's risk management, its management quality and its competitive advantage.

ESP and risk management

When mainstream capital markets look at environmental and social issues, two focal points immediately emerge: risk caused by (bad) environmental and social performance, and business opportunities based on proactive environmental and social performance (EFFAS, 2009). Environmental and social issues could affect firms' risk and business opportunities which are linked with their economic performance. The scope of risk management systems has evolved from a financial focus to a broader range of environmental and social issues. For example, in the long run, ESP data assists in marketing firms' names and managing their reputation risk.

A study by EIRIS (2009) analyses the strategies of environmental and social risk management for firms in the FTSE All World Development Index between 2005 and 2008. The study focuses on how well firms are addressing

environmental and social risks under four areas: board responsibility; risk management systems; identification of environmental and social risks and potential liabilities; and opportunities. It is found that 1) Japanese firms demonstrate the strongest performance; 2) financial sector demonstrates poor performance in environmental and social risk management, which may be a result of poor disclosure or the failure of financial institutions to recognize the relevance of considering environmental and social risk; and 3) firms perform well on environmental and social risk identification but poorly on management (e.g., board responsibility).

ESP can also be a means of risk management for banking industry. For example, Macve and Chen (2010) examine the roles that voluntary code specifically - Equator Principles play in encouraging consideration of social and environmental issues in project financing. They state that protecting the environment is a by-product of banks' risk management process. The Equator Principles are a set of principles committing the signatory banks to finance only projects that meet social responsibility criteria. Compliance with these criteria should be good for the bottom line of the signatory banks, as well as good for society as a whole (Heal, 2005).

However, environmental and social risk management is not just for financial institutions but for all firms and their shareholders. According to a report produced by the Global Reporting Initiative (2009),

“Investors expect to see a discussion of the key risks and opportunities associated with ESG strategies, and prefer to see this consolidated into a single section of a report. ESG information generally identifies firms’ key risks and opportunities linked to corporate strategy and market trend, which can be helpful for investors to make decision.” (p.6)

Therefore, it can be stated that environmental and social issues enable firms and their investors, to understand the risks and opportunities businesses face, allowing enhanced risk management and security selection (Bassen and Kovacs, 2008).

ESP and management quality

Greenwald (2009) finds that more and more firms treat environmental and social issues as part of their firms' strategy. Greenwald investigates the

relationship between environmental and social performance data and management quality for a sample of US investment banks. The results show that the US investment banks that survived in the credit crisis performed better on environmental and social issues than those that didn't. According to Greenwald, this perhaps surprising correlation suggests a strong indicator of management quality: managements able to assess and mitigate longer-term strategic risks to their business are also better equipped to cope with a crisis.

Greenwald (2009) finds that social dimension and corporate governance data from the 5 investment banks were quite similar in 2006, including policies and actual performance measures such as committee independence and compensation ratios. However, environmental dimension reveals key differences. He concludes that environmental factors do not have a significant material link to the financial performance of companies in the short term. However, these subtle differences in company reporting may provide important signals concerning the seriousness with which ESG factors are taken by management, thus impacting the long run performance of the firm.

ESP and competitive advantage

Jones (1995) develops a model that integrates economic theory and ethics. Jones (1995) finds that firms conducting business with stakeholders on the basis of trust and cooperation have an incentive to demonstrate a sincere commitment to ethical behaviour. The ethical behaviour of firms in turn can enable them to achieve a competitive advantage, because they will develop lasting, productive relationships with these stakeholders.

Russo and Fouts (1997) examine CSR from a resource-based view of the firm perspective. They argue that CSR, specifically environmental performance can constitute a source of competitive advantage, particularly in high-growth industries. They find a positive link between environmental performance and firm operating profitability. They assumed this link to be mediated by the unobserved superior environmental strategy which they conjectured to be based on unique combinations of intangible (such as human, reputation, technology) and tangible (such as financial reserves and physical equipment) assets.

McWilliams and Siegel (2001) posit that CSR can be a differentiation strategy to create new demand to command a premium price for an existing product (service). Firms that seize an early opportunity to develop technologies in anticipation of new environment issues such as climate change may offer a lower risk profile and enhanced return opportunities to their shareholders compared with their competitors. Furthermore, CSR may act as a vehicle for innovation, which may provide a test of a product or service before launching that product or service to a wider public (Kanter, 1999 cited by Husted, 2005). It is also evident that CSR has a close relationship with R&D (McWilliams and Siegel, 2000).

To sum up, environmental and social issues are important for firms to manage potential risks and opportunities and their business performance; and for investors to evaluate firms' performance, especially business long-term viability.

2.4 Regulatory frameworks and policy guidelines of environmental and social responsibility

In the following paragraphs, relevant regulatory frameworks and policy guidelines regarding environmental and social responsibility reporting are introduced. Many firms already provide environmental and social information voluntarily. For example, they promote their environmental and social accomplishments either in their annual reports and/or in a separate stand-alone report. Firms in industries such as energy, forestry, and manufacturing use similar reporting techniques as a means to answer their critics (Tschopp, 2005). However, in the absence of legislative requirements governing the form of environmental and social disclosures, there is an inherent degree of variation of reporting styles. Nevertheless, there are some regulatory frameworks and policy guidelines guiding firms' environmental and social responsibility reporting such as the AA1000 Assurance Standard, the Companies Act 2006 (about director's duty) and the Global Reporting Initiative (GRI). These will be described in the following paragraphs of this chapter.

2.4.1 International policy guidelines

2.4.1.1 The Institute of Social and Ethical Accountability (ISEA) AA1000AS

The AA1000 Assurance Standard launched on 25 March 2003 is the world's first assurance standard developed to ensure the credibility and quality of an organisation's public reporting on social, environmental and economic performance (AA1000 Framework, 2003). The external audit process of a firm's sustainability report is mainly based on the AA1000, GRI guidelines, ISAE3000, and/or Lloyd's Register Quality Assurance. Assurance process involves stakeholder interviews, comparing reports, and reviewing documentation accuracy etc. For example,

“Evaluate the nature and extent of adherence to the AA1000AS principles of inclusivity, materiality and responsiveness and assure the behaviour of the organisation as reported.” – United Utilities 2010 corporate responsibility report: Assurance section

Following a comprehensive multi-stakeholder revision of the 2003 standard, the AA1000 Assurance Standard 2008 was developed. It provides a comprehensive method of holding an organisation to account for its management performance and reporting on sustainability issues by evaluating the adherence of an organisation to the AccountAbility Principles and the reliability of associated performance information. It requires the assurance providers to look at underlying management approaches, systems and processes and how stakeholders have participated. This enables them to evaluate the nature and extent to which an organisation adheres to the AccountAbility Principles. The assurance providers use the Principles as criteria when evaluating an organisation. It provides findings and conclusions on the current status of an organisation's sustainability performance and provides recommendations to encourage continuous improvement.

2.4.1.2 The UN Global Compact (UNGC)

The UN Global Compact (UNGC) is a strategic policy initiative for firms that are committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption. The ten principles are listed as follows (UNGC homepage):

Human Rights

- Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
- Principle 2: make sure that they are not complicit in human rights abuses.

Labour

- Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and
- Principle 6: the elimination of discrimination in respect of employment and occupation.

Environment

- Principle 7: Businesses should support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote greater environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

Anti-Corruption

- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

The UNGC increased pressure on its signatories to report regularly on their ESG achievements, and removed 394 of approximately 3775 signatories for inadequate reporting (Ethical Performance, 2008). By complying with these principles, firms demonstrate their commitment to their stakeholder responsibility, and such firms are more likely to embrace environmental and social activities as an issue addressing their organisations.

The Principles for Responsible Investment are the result of an initiative brokered by the United Nations Environment Programme and the UN Global Compact. Asset owners, investment managers and professional service partners are invited to sign up to a set of six principles on environmental, social and governance issues. The Principles for Responsible Investment (PRI) provide impetus for investors to give greater consideration to ESG risks and provide better disclosure of ESG matters (Gifford, 2009).

2.4.1.3 Global Reporting Initiative's Sustainability Reporting Guidelines

The Global Reporting Initiative (GRI) was launched in 1997 to develop a globally accepted reporting framework (G3 guideline) and to enhance the

quality of sustainability reporting. The key aim of GRI guidelines is to improve transparency, comparability and clarity. The GRI 2000 guidelines were revised in 2002 and 2006. The most recent one (2006 GRI G3 guidelines) includes three different types of disclosure guidance: strategy and profile; management approach; and performance indicators.

- *Strategy and Profile: Disclosures that set the overall context for understanding organizational performance such as its strategy, profile and governance.*
- *Management Approach: Disclosures that cover how an organization addresses a given set of topics in order to provide context for understanding performance in a specific area.*
- *Performance Indicators: Indicators that elicit comparable information on the economic, environmental and social performance of the organization (p.5).*

Reporting firms are encouraged to follow this structure in compiling their reports, however, other formats may be chosen. According to Henriques (2010), GRI reporting guidelines have been developed by a multi-stakeholder process, which gives it a high degree of legitimacy, and set out the most highly regarded and widely used set of environmental and social indicators. Compliance with the GRI reporting guidelines is voluntary and these guidelines emphasise environmental, social and economic disclosures. Accordingly, by complying with these guidelines, firms demonstrate that they take their stakeholder responsibility seriously.

Most firms' sustainability reports are disclosed in the form of GRI framework. According to a recent study by the Sustainable Investment Research Analyst Network (2009), more than 80% of S&P 100 companies provide information through sustainability websites; almost half produce a sustainability report; and more than one-third make use of the GRI guidelines, the international standard for environmental and social reporting. Worldwide, 77% of the world's 250 largest firms use the GRI. Gifford (2009) states that GRI has pioneered the development of the world's most widely used sustainability reporting framework and is committed to its continuous improvement and application worldwide. This framework sets out the principles and indicators that firms can use to measure and report their economic, environmental and social performance. Investors are increasingly asking their investee companies to use GRI as a reporting framework.

Based on GRI guidelines, a firm's sustainability report generally includes the following information;

- 'About the report' section briefly introduces the content of a firm's sustainability report;
- CEO statement consists of business strategy, risks and opportunities information;
- Company information includes business services and products, culture, vision and value, governance and company structure;
- CR/sustainability strategy shows relevant CR strategy used or will be used in the following year;
- GRI G3 guidance - GRI table with key performance indicators including economic, social and environmental information respectively;
- Performance data contains past and/or future data with 5 years goals; and most of them are quantitative information;
- Stakeholder engagement and materiality sections;
- Assurance (GRI guidelines recommend the use of external assurance for sustainability reports in addition to any internal resources);
- 'Contact us' part provides information about a firm (e.g., media enquiry).

To sum up, AA1000AS, UN Global Compact and Global Reporting Initiatives reporting guidelines are voluntary policy guidelines at international level. According to Burchell (2008), in the UK, the Company Law Review and its subsequent output (the Government White Paper on Company Law), attempted to reach a compromise on the issue of non-financial reporting, by calling for firms of a certain size to report on social and environmental issues. That is, if it is 'material' to a firm's operations, then adequate pressure should be brought to bear on firms to fully disclose their impacts. In the UK, there are some regulatory requirements regarding environmental and social responsibility such as Companies Act 2006 and Pension Funds Amendment Act 2001 which are discussed in the following section.

2.4.2 Regulatory frameworks in the UK

2.4.2.1 Companies Act 2006 and Pension Funds Amendment Act 2001

UK Companies Act 2006 sec.417 (5) and (6) state that environment, employee, social and community issues are the key areas a quoted company is required to provide information about, using financial and/or non-financial key performance indicators. The UK Companies Act suggests that companies should follow a “comply or explain” approach to reporting of non-financial indicators in their Business Review.

Sec.417 (5) In the case of a quoted company the business review must, to the extent necessary for an understanding of the development, performance or position of the company's business, include—

(a) the main trends and factors likely to affect the future development, performance and position of the company's business; and

(b) information about—

(i) environmental matters (including the impact of the company's business on the environment),

(ii) the company's employees, and

(iii) social and community issues,

including information about any policies of the company in relation to those matters and the effectiveness of those policies; and

(c) subject to subsection (11), information about persons with whom the company has contractual or other arrangements which are essential to the business of the company.

If the review does not contain information of each kind mentioned in paragraphs (b) (i), (ii) and (iii) and (c), it must state which of those kinds of information it does not contain.

Sec.417 (6) The review must, to the extent necessary for an understanding of the development, performance or position of the company's business, include—

(a) analysis using financial key performance indicators, and

(b) where appropriate, analysis using other key performance indicators, including information relating to environmental matters and employee matters.

“Key performance indicators” means factors by reference to which the development, performance or position of the company's business can be measured effectively.

The Pension Funds Amendment Act 2001 is a new mandatory requirement for UK pension fund trustees to disclose how they have considered social, economic and environmental matters.

These are compulsory environmental and social related disclosure requirements in the UK. It appears that UK government tends to attach greater importance to environmental and social issues, especially in terms of calling for environmental and social disclosures from institutional investors such as pension fund trustees. Furthermore, it indicates that firms' environmental and social issues are important in evaluating firms' business performance; especially disclosures of their policies and performance related to employee, community and environment are given greater importance. In addition, according to a survey published by the Accounting Standards Board (FRC, 2007), it is found that there has been an increase of reporting on environmental, employee and social issues; although very few companies discuss their contractual arrangements and relationships in any depth.

2.4.2.2 Climate Change Act 2008

The Climate Change Bill was introduced into the Parliament of the UK on 14 November 2007 and became law on 26 November 2008. In March 2009, the Climate Change Act Impact Assessment was updated to reflect the final content of the Act. The key aims of the Climate Change Act 2008 are 1) to improve carbon management, helping the transition towards a low-carbon economy in the UK; 2) to demonstrate UK leadership internationally, signalling the commitment of sharing responsibility for reducing global emissions in the context of developing negotiations on a post-2012 global agreement at Copenhagen in December 2009. The Climate Change Act 2008 sets a target for the UK to reduce carbon emissions to 80% below 1990 levels by 2050. It also sets an interim target of a 34% reduction by 2020 (with the potential to increase this to a 42% cut given an international agreement). It has also established the concept of carbon budgets. The Act creates a new approach to managing and responding to climate change in the UK (Department of Energy and Climate Change, 2009).

Overall, the regulatory frameworks in the UK such as Companies Act 2006, Pension Funds Amendment Act 2001 and Climate Change Act 2008 are

mandatory requirements for UK firms to provide relevant information about their environmental and social responsibility. However, since there is no clear mandatory guideline about environmental and social performance indicators/measurements, these regulatory frameworks appear to be the minimum requirements in the UK. Hence, it is difficult for firms to follow and provide relevant environmental and social information required by the wider user groups. However, there are some voluntary frameworks or policy guidelines providing environmental and social responsibility indicators in the UK (e.g., Carbon Disclosure Project indicators), which will be introduced in the next section.

2.4.3 Other frameworks and policy guidelines in the UK

2.4.3.1 Carbon Disclosure Project (CDP)

The Carbon Disclosure Project is an independent not-for-profit organisation holding the largest database of primary corporate climate change information in the world. Thousands of organisations from across the world's major economies measure and disclose their greenhouse gas emissions, water management and climate change strategies through CDP. CDP put this information at the heart of financial and policy decision-making (CDP website). CDP provides detailed environmental performance indicators such as carbon emission or carbon intensity. In Chapter 5, carbon emission data (scope 1 and scope 2) is collected from CDP and is used to measure carbon eco-efficiency.

2.4.3.2 Department for Environment Food and Rural Affairs (DEFRA)

In September 2009, the Department for Environment Food and Rural Affairs published Environmental Reporting Guidelines – Key Performance Indicators (KPIs) guidance for business and organisations to identify and address their most significant environmental impacts, and to set targets/KPIs to measure environmental performance. Transparency, accountability and credibility are the three general principles of the KPIs. Quantitative nature, relevance and comparability are the common requirements of the KPIs. There are 22 KPIs considered to be significant to UK businesses. These are supplemented by KPIs on supply chains and products. The KPIs include: 6 indicators of emissions to air, 2 indicators of emissions to water, 5 indicators of emissions to land, and 9 indicators of resource usage. There are 4 supplementary indicators

that measure business linked environmental impact such as supply chains, products, biodiversity, environmental fines and expenditures.

2.4.3.3 Association of Chartered Certified Accountants (ACCA)

ACCA indicate that an ideal environmental report should consist of organisation profile, environmental policy statement, targets and achievements, performance and compliance, management systems and procedures and independent verification statement. Compared to other environmental reporting countries like US (toxic release inventory based reporting) and Sweden (product focused reporting), UK adopts compliance and performance based reporting. In other words, external regulations, companies' environmental impacts and performance improvement targets setting are important components of environmental reporting. Furthermore, the ACCA UK Environmental Reporting Awards set out some criteria to judge companies' environmental reporting levels, including completeness, credibility and communication, covering aspects like environmental impact, policy, targets, management commitment, internal and external credibility.

To sum up, above-mentioned guidelines only refer to environmental dimension in the UK. Based on these voluntary guidelines, it can be seen that it is important for firms to provide more quantitative performance information (e.g., environmental impact including water or carbon emission etc.). Furthermore, it seems that only GRI provides the most comprehensive guidelines regarding social indicators. In this thesis, I use two comprehensive data sets, providing comparable and quantifiable indicators, namely Bloomberg environmental and social disclosure scores and Asset4 environmental and social performance scores, which will be explained in more detail at the end of this chapter.

2.4.4 Stock Exchange related and government reporting requirements

According to an EIRIS Report (2009), the London Stock Exchange requires companies to disclose the following: relevant environmental, social, workplace, and community information; to incorporate ESG disclosure requirements into listing rules and corporate governance standards; to implement disclosure requirements on a 'comply or explain' basis; to support the requirement for a resolution on a sustainability report; and to explore measures to encourage best practice amongst firms (e.g., through sustainable indices). Based on such

disclosures, many rating agencies have developed comprehensive environmental and social related indices such as Bloomberg and Asset4 that are used in this thesis.

There is no doubt that stock exchanges currently play a key role in capital markets through setting a benchmark for disclosure through their listing requirements, ensuring liquidity and maintaining confidence and integrity in the market (EIRIS, 2009).

As shown above, UK government and regulators increasingly expect and are beginning to require carbon reporting. For example, the UK was the first country to introduce mandatory carbon reporting (Papanicolaou et al., 2012). That is, all companies listed on the Main Market of the London Stock Exchange were required to report their annual levels of greenhouse gas ("GHG") emissions from the start of April 2013.

Many other countries also require listed companies to provide ESG reporting. For example, the French government was the first to require publicly traded firms to include 40 social and environmental indicators in their reports to shareholders in 2003. More recently, the Swedish government announced in late 2007 that all 55 publicly traded firms in which it held ownership must begin reporting by 2010 on the extensive set of social and environmental indicators covered by the GRI guidelines. In addition, in early 2008 the Chinese government announced that state-owned firms would be expected to begin reporting their ESG records. Therefore, it is timely and relevant to study corporate environmental and social responsibility in the current climate of rising awareness of stakeholder responsibility.

Table 2.1 provides a summary of aforementioned frameworks.

Table 2.1 A summary of relevant frameworks

Framework	International /UK	Guidelines/Requirements	Mandatory/ Voluntary	E(S)D/ E(S)P
AA1000 Assurance Standard	International	The assurance providers evaluate the nature and extent to which an organisation adheres to the AccountAbility Principles. They use the Principles as criteria to investigate the underlying management approaches, systems and processes and how stakeholders have participated. It provides findings and conclusions on the current status of an organisation's sustainability performance and provides recommendations to encourage continuous improvement.	Voluntary	ESD
UN Global Compact	International	Follow ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption; and report regularly on firms' ESG achievements.	Voluntary	ESP
Global Reporting Initiative G3 guideline	International	Report CEO statement such as business strategy, risks and opportunities; company information (like business services and products, culture, vision and value, governance and company structure); sustainability strategy; key performance indicator (including economic, social and environmental disclosure); performance data (past and/or future data, 5 years goals, most of them are quantitative information); stakeholder engagement and materiality; and assurance (GRI guidelines recommend the use of external assurance for sustainability reports in addition to any internal resources.)	Voluntary	ESD
Companies Act 2006 sec.417 (5) and (6)	UK	Require a quoted company to provide financial and/or non-financial key performance indicators related to environmental, employee, social and community issues; and follow a "comply or explain" approach to non-financial indicators in its Business Review section.	Mandatory	ESD

Pension Funds Amendment Act 2001	UK	Require UK pension fund trustees to disclose how they have considered social, economic and environmental matters.	Mandatory	ESD
Climate Change Act 2008	UK	Set a target for the UK to reduce carbon emission to 80% below 1990 levels by 2050, set an interim target of a 34% reduction by 2020, and established the concept of carbon budgets. It creates a new approach to managing and responding to climate change in the UK.	Mandatory	EP
CDP environmental performance indicators	UK	Provide detailed environmental performance indicators such as carbon emission	Voluntary	EP
DEFRA Environmental Reporting Guidelines	UK	Provide 22 key performance indicators (KPIs) guidance for business and organisations to identify and address their most significant environmental impacts, and to set targets/KPIs to measure environmental performance.	Voluntary	ED
ACCA environmental reporting guidelines	UK	Set out some criteria to judge companies' environmental reporting level. An ideal environmental report should consist of organisation profile, environmental policy statement, targets and achievements, performance and compliance, management systems and procedures and independent verification statement.	Voluntary	ED
London Stock Exchange requirements	UK	Require companies to disclose relevant environmental, social, workplace, and community information and to incorporate ESG disclosure requirements into listing rules and corporate governance standards etc.	Voluntary	ESD
London Stock Exchange requirements	UK	All companies listed on the Main Market of the London Stock Exchange were required to report their annual levels of greenhouse gas ("GHG") emissions from the start of April 2013.	Mandatory	ED

2.5 Environmental and social responsibility measures

In this section, various available corporate social responsibility indices will be reviewed including those used in this thesis. These include environmental

and/or social responsibility measures from Bloomberg, Carbon Disclosure Project and Asset4 databases.

According to Hammond and Slocum Jr. (1996), there are three different ways to measure a firm's performance on corporate social responsibility. First, experts are asked to evaluate a firm's corporate policies according to some established criteria. However, the validity of this measurement resides in the expertise of those persons making the assessments.

Second, researchers have used content analysis of corporate annual reports and other documents to assess a firm's social responsibilities (Friedman and Miles, 2001; Prado-Lorenzo et al., 2009). The content analysis method is based on a variety of disclosure frameworks (e.g., the most common one is the GRI guidelines), and uses data from annual reports and/or sustainability reports. The main advantage of this method is that it uses reasonably objective data, as now there is computer-aided software such as Leximancer available to help codify qualitative materials. However, the choice of variables is subjective.

A third method is to use existing indices. In order to measure the level of social information reported, a widely used method called indexing has been adopted (Wallace and Naser, 1995). Indexing involves checking information disclosed against a list of information items. A score is then awarded depending on whether an item is disclosed or not, and a total score is derived for each firm. Hence, the index method is a model that combines several disclosure items into a single measure. Owusu-Ansah (1998) mentions that this approach has several advantages: it is capable of rank ordering companies in terms of their disclosure scores. Furthermore, Wallace and Cooke (1990) state that as a score of an index can be treated as a variable to which both parametric and non-parametric methods can be applied, indexing approach allows carrying out suitable statistical analysis. For example, Parsa and Kouhy (2008) show that the European Commission categorises corporate social responsibility into eight aspects: 1) workplace issues, 2) human rights, 3) impact on the community, 4) reputation, branding and marketing, 5) ethical investment, 6) environment, 7) ethics and corporate governance, and 8) health and safety (CSR Europe, 2003). Some of these items are divided into subcategories, giving rise to a total of eighteen social information items of the index. An item was scored one if it is

disclosed, and zero otherwise. A relative scoring procedure is established with disclosure scores calculated by dividing the actual score of a firm by its total maximum possible score (TMS). The relative index score (RIS) for each firm is the ratio of the actual number of items disclosed (AS) to the total maximum score potentially awarded (TMS). This approach provides the benchmark to compare/rank corporate social responsibility and enables to conduct statistical analysis.

2.5.1 Development of environmental and social responsibility indices

The early CSR index was developed by Moskowitz (1972), which he updated over several years (based on the surveys evaluated by Moskowitz and a panel of businessmen and MBA students). This index has been widely used in early CSR studies (Bowman and Haire, 1975; Cochran and Wood, 1984). However, Moskowitz's index is only one-dimensional CSP measurement.

It is followed by the Council on Economic Priorities' rankings (CEP, 1977) which focus on the investigations of pollution control records of the largest companies in five highly polluting industries. Each company's social performance is objectively measured by eleven issues: environment, charitable giving, women in management, minority management, animal testing, information disclosure, community outreach, South Africa, family benefits, military work and nuclear involvement. Although scholars have used the CEP ratings broadly (e.g., Fogler and Nutt, 1975; Spicer, 1978; Freedman and Jaggi, 1982), some issues like animal testing, South Africa and family benefits are not commonly used in developing CSR index today.

Carroll (1979) proposed a new corporate social performance model - a three-dimensional model of corporate social performance, including social responsibilities (i.e., economic, legal, ethical and discretionary responsibilities), six social issues (consumerism, environment, discrimination, product safety, occupational safety and shareholders) and social responsiveness philosophy. Carroll's multi-dimensional model of CSP is easy to understand and has an intuitively appealing logic, which is most durable and widely cited in the literature. However, Carroll's model gives top priority to the economic dimension as an aspect of CSR, and the major problem is that social issues change and they differ for different industries. Prior studies investigate the relationship

between institutional ownership and firms' corporate social performance. For example, Coffey and Fryxell (1991) adopt Carroll multidimensional CSP measurement and find that there is no relationship between institutional ownership and charitable giving, but a positive relationship between number of women on the board and institutional investment. They suggest that in 1984 institutional investors were fairly indifferent to social criteria. They also provide a possible explanation of the positive link between number of women on the board and institutional investment as "*institutional investors actually advocate board diversity, perhaps based on beliefs that it will improve firm performance*" (p.442).

McGuire et al. (1988) developed the Fortune magazine's rating of corporate reputation, with eight attributes: quality of management, quality of products and services offered, innovation, value as a long-term investment, soundness of financial position, ability to attract and retain talented people, responsibility to the community and the environment, and wise use of corporate assets. Reputation indices are based on the assumption that CSP reputations are good reflections of underlying CSP values and behaviours. Since this index is based on surveys, it is very difficult to convert above attributes into quantifiable variables, and it is only applied in the US companies.

Another index called New Consumer Group ratings was developed by Adams et al. (1991). This is the only index that differentiates CSR disclosure and performance, which includes CSR disclosure as one of firms' CSR performance indicators. The 13 ratings produced by NCG include 4 main elements - CSR disclosure, women's position, ethnic minorities' position, philanthropy and environmental actions. The main issue is that the NCG index only focuses on consumer sector. Sectors such as financial services and media related products are not included, which is due to the difficulties associated with the assessment of CSR performance.

KLD, EIRIS and CKRG have developed more complex indices using a variety of surveys and other data sources. More recent corporate social responsibility studies use KLD data. This index is compiled by an independent rating service which focuses on a wide range of firms over a broad spectrum of CSR screens. This database rates companies on 13 dimensions of CSR including community,

corporate governance, diversity, employee relations, environment, human rights, product quality and safety, alcohol, firearms, gambling, military, nuclear power and tobacco. Each dimension in the KLD database is summarized in terms of strengths (positive values) and concerns (negative values). A firm is given a score of 0 or 1 across each strength or concern. KLD based CSP index is widely accepted by practitioners and academics as an objective measurement. According to Callan and Thomas (2009), two of the more prominent aggregate measures used in academic studies are: the Fortune ratings data; or the indices formed from social attributes provided by KLD, with more recent studies gravitating toward the use of KLD data. Waddock and Graves (1997), for example, believe that the KLD indicators are superior to the Fortune data because the latter are more about a firm's overall management than its socially responsible decisions. Furthermore, Chand (2006) asserts that a KLD-based index offers more objectivity than a measure based on Fortune's survey data. However, KLD data is only applied for US studies. Graves and Waddock (1994) use KLD data to measure firms' CSP, and find a positive link between institutional investors' stock preferences and socially responsible performance. They suggest that the preference is due in part to the long-term performance of the investment. They also argue that CSR adds value to the organisation over the long term, attracting, in turn, leading institutional investors.

However, it is argued by Humphrey et al. (2012) that it is not appropriate to calculate an overall CSP score as the total number of strengths minus the total number of concerns. If a firm is engaged in business practices that involve hazardous waste, this activity will be scored 1 under 'concern'. This will lower the firm's overall CSP score. If another firm is not engaged in practices that involve hazardous waste, it will receive 0 and thus hazardous waste will not contribute to the firm's overall score. Furthermore, Humphrey et al. (2012) mention that there are several issues of KLD's rating systems. Take hazardous waste production as an example. First, the binary ratings do not distinguish between the levels of hazardous waste production. Second, firms in heavy polluting industries like Oil and Gas have lower KLD score than other firms that have very limited or no disclosure to producing hazardous waste, regardless how well the firm manages its hazardous waste. Third, the number of measures within each of KLD's dimensions can skew overall CSP scores. Take

environmental dimension as an example - a firm has a total of 5 strengths and 10 concerns. By definition, the KLD ratings system is biased toward a higher concern score for those industries disclose information about their environmental concerns.

In the UK, the most commonly used CSR index is Ethical Investment Research Service (EIRIS) CSP rating. Cox et al. (2004) use EIRIS data to measure CSP for a sample of UK firms and find that long-term institutional investment is positively related to firms' CSP. EIRIS uses information such as annual reports and company publications, in addition to direct surveys of sample companies, to develop a set of relatively objective criteria relating to corporate social impacts and their management. The data is in the form of a searchable database with about 170 questions covering the whole range of social concerns, including environment, employee, community and society, human rights and supply chain. Due to data availability issue, some scholars only include the first three aspects of CSP as corporate social performance measurement (i.e., environment, employee and community). Comparing EIRIS with Bloomberg or Asset4 ESG databases (both of which will be discussed below), the latter two datasets (i.e., both Bloomberg and Asset4) are of better quality and are significantly more detailed than the ratings data available from EIRIS. Bloomberg provides 100 data points and Assets4 has 250 key performance indicators. Similar to KLD, EIRIS do not distinguish between general and industry-specific ESG criteria. In addition, the ESG scores of Bloomberg and Asset4 range from 0 to 100, which improves on EIRIS granular 0 to 3 CSP rating scale (Humphrey et al., 2012).

Recently, the Global 100 Most Sustainable Companies rating developed by the Canadian research firm CKRG has been released. This index consists of 10 KPIs and a transparency indicator: energy productivity, carbon productivity, water productivity, waste productivity, leadership diversity, CEO-to-average worker pay, % tax paid, sustainability leadership, sustainability remuneration, innovation capacity and transparency. The CKRG Global 100 index is based on a group of data providers including Thomson Reuters and Bloomberg. The key advantage of this index is: ESG data is industry adjusted and integrated with financial data to enhance analysis.

To sum up, there are both advantages and drawbacks of previous CSR measurements (See Appendix 1 for details). It can be seen that some early studies tend to focus on only one or few areas of CSR. It seems difficult to construct a truly representative CSR measure because of its complexity. Measurement of a single dimension provides too limited perspective on how well a company is actually performing in the relevant social domains (Lydenberg et al., 1986; Wolfe and Aupperle, 1991). However, a variety of relevant/common dimensions have been identified from aforementioned indices, such as indicators related to employees, community relations, issues concerned with women and minorities, environmental responsibility and product safety. Some researchers construct CSR measurement from different stakeholders' perspectives, namely employees, customers, communities and environment. Margolis and Walsh (2001) have reviewed ninety-five empirical studies that examine the link between CSR performance and financial performance. The ninety-five studies use twenty-seven different data sources to assess CSR performance, while environmental practices are the most commonly evaluated aspect of CSR performance, followed by community investment and human resources.

In conclusion, some consistent criteria for developing a reliable CSR index are needed. First, CSR index should be suitable for cross-industry studies. Second, it should reflect some important aspects of CSR. Third, it should be possible to convert multidimensional CSR into quantifiable indicators. Finally, reliable and comparable data must be available from companies' reports or websites. This thesis uses unique databases that meet above criteria. In the following paragraphs, Bloomberg, Carbon Disclosure Project and Asset4 environmental and social responsibility measures used in this thesis are introduced.

2.5.2 Bloomberg ESD measures

Bloomberg provides a comprehensive index including environmental, social and governance (ESG) disclosure scores (see Appendix 2 for details). It has researched 20,000 firms around the world and found ESG data disclosed by 4100 firms in 52 countries⁴. For each firm, Bloomberg has developed ratios and

⁴ Use command BESGPRO <index> DES <go> then MEMB <go>, it is found that firms may not have disclosed all 3 areas. Currently, there are 4077 firms processed for ESG information on a monthly basis. As of 25/02/2011, there are 625 companies in the FTSE all share index provide some ESG information.

KPIs to better compare and analyse firms on ESG metrics. Furthermore, Bloomberg seeks to be a standard-setter in the area through relationship with major non-governmental and not-for-profit organisations (e.g., GRI, UNGC and Ceres). The ESG scores measure firms' environmental, social and governance disclosures, capturing the level of firms' transparency related to its non-financial performance and governance.

Bloomberg collects 100 different data points related to ESG. For each firm, Bloomberg then develops a score that ranges from 0 for firms that do not disclose ESG data to 100 for those that disclose every data point collected by Bloomberg. ESG data is collected from company-sourced filings (e.g., CSR reports, annual reports, company websites, and a Bloomberg survey that requests data from companies). According to Bloomberg, none of the data is estimated or derived; every data filed has transparency back to a company document. If a firm's disclosure is not covered by ESG data points or companies do not disclose anything, then they will be marked as 'N/A'. Furthermore, since weights assigned to different ESG factors are not constant across industries, the score is adjusted by industry and weighted by importance. In other words, each firm is only evaluated in terms of the data that is relevant to its industry sector. For example, a data point like Phones Recycled is only considered in the score for Telecommunications firms and not for other sectors. Similarly, Gas Flared only goes into computing the disclosure score for oil and gas exploration and production firms, while companies in other sectors are not penalized for not disclosing it. Data point such as Greenhouse Gas Emissions or Number of Independent Directors carries greater weight than other disclosure items, which is decided by ESG practitioners. In addition, the score is then expressed as a percentage, making firms comparable both within and across industry sectors. Hence, the features of Bloomberg ESG disclosure scores meet the above-mentioned criteria of a reliable CSR index, that is, these are comparable across companies and industries; are quantifiable; are based on reliable data; and reflect timely and relevant aspects of CSR.

The environmental 'E' score covers various types of environmental information that could broadly be classified as 'hard' items and 'soft' items. Hard items include data points like Carbon/GHG emissions, energy/water consumption, waste recycled, investments in sustainability and ISO certification, among

others. Soft items include firms' environmental policies and initiatives such as waste reduction policy, energy efficiency policy and green building policy, among others. It can be seen from Appendix 2; approximately 80% of E items covered are hard data items, while only 20% of them (12 out of 60) are soft data points. Thus, the environmental score largely measures a firm's hard environmental disclosure, which Clarkson et al. (2008) suggest, would be difficult for poor environmental performers to provide. Thus higher 'E' score would denote more environmentally responsible disclosure.

The social 'S' score developed by Bloomberg mostly covers reporting of issues related to human resource relations such as employee health and welfare, as well as their training and development including training in CSR. The 'S' score also covers disclosure of issues of equality and diversity in employment, community spending and human rights. Based on the type of information covered, about 70% of social score is based on hard items while soft information makes up about 27% of the score (7 out of 26 data points). Thus the higher a firm's 'S' score, the more inclined it is to be 'socially' responsible.

2.5.3 Carbon emission data

UK firms' carbon emission data is available from the Carbon Disclosure Project website and published reports. As mentioned in section 2.4.3.1, the Carbon Disclosure Project (CDP) is an independent not-for-profit organisation working to drive greenhouse gas emissions reduction and sustainable water use by business and cities. Thousands of firms report their greenhouse gas emissions, water management and climate change strategies through CDP every year. The CDP then produces annual reports which analyse these responses, submitted through investors, supply chain, public procurement and cities programs. Hence, every year CDP publishes a number of analytical reports written by CDP partner organisations and provides detailed analysis of the responses indicating important trends and development, including the FTSE350 report. The FTSE350 report provides carbon emission data for FTSE350 companies, including aggregated carbon disclosure score, scope 1, scope 2, scope 3, and total carbon emission data. It can be used to work out carbon intensity (the ratio of carbon emissions to total sales in local currency). The reports released in recent years also provide information related to CDP's verification (e.g., Year 2011). However, due to data availability, only year 2008 and 2009 emission

data was available when the data for this study was being collected in 2010⁵. Hence, this study uses data only for these two years.

2.5.4 Asset4 ESP measures

Asset4 a database of Thomson Reuters, provides environmental, social and governance performance information, which is primarily used by professional investors and corporate executives. It provides objective, relevant and systematic ESG performance information. A team of over 130 experienced analysts collect 900 ESG evaluation points per firm, which is used to calculate 250 key performance indicators. Each data point goes through a multi-step verification process, including a series of data entry checks, automated quality rules and historical comparisons. Data sources include stock exchange filings, CSR and annual reports, non-governmental organisation websites and various news sources. Primary data used are objective and publically available.

There are 18 categories of key performance indicators within four pillars, namely Economic (3 categories), environmental (3 categories), social (7 categories) and governance (5 categories). Only environmental, social and governance pillars are relevant for the analysis in this thesis. The environmental score as defined by Asset4 “*measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities*”. It covers “hard” performance indicators (as classified by Clarkson et al., 2008) such as information on energy used, CO₂ emissions, water and waste recycled, and spills and pollution controversies. Hence, the aggregate environmental score measures a firm’s environmental performance. The social score as defined by Asset4 “*measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices*”. It covers issues like employee turnover, accidents, training hours, donations, and health and safety controversies. Social score also covers mostly “hard” performance indicators and hence is an objective measure of the social

⁵ I also use Bloomberg to check carbon data availability. Use command CEDL <go> to check all companies submitted emission data to CDP, it is found that there are 2588 companies in the UK exchange market submitted emission data, but only 208 companies provide carbon information in 2006/2007/2008.

performance of a firm. Table 2.2 shows the pillars and sub-categories of ESG scores from Asset4.

Table 2.2 ESG pillars and sub-categories (2002-2010)

Pillars	Sub-categories
Environment score (ENVSCORE) – The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long-term shareholder value.	Emissions reduction Resource reduction Product innovation
Social score (SOCSCORE) - The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.	Employment quality Health & Safety Training & Development Diversity Human rights Community Product responsibility
Governance score (CGVSCORE) - The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long-term shareholder value.	Board structure Board function Compensation policy Shareholder rights Vision & Strategy

Note: Datastream code is presented in parentheses.

From Table 2.2, it can be seen that E, S and G pillars measure firms' environmental, social and governance performance respectively. Asset4 ESG data can be obtained from Datastream. The ESG data is available from 2002 onwards. Firms with no Asset4 ratings are excluded from the study in Chapter 6. This limitation of the analysis is discussed in further detail in the relevant chapter.

Asset4 provides more comprehensive calculation of the rating scores. Key performance indicators, categories, pillars and overall score are equally weighted computer calculations of relative company performance, the benchmark being the Asset4 company universe. These ratings are Z-scored and normalized to position the score between 0 and 100%. The Z-score is a relative measure comparing one company with a given benchmark. It expresses the value in units of standard deviation of that value from the mean value of all companies. Among other things, this allows to create more distinction between values that otherwise might be very close together (Asset4 document). A

number of prior studies adopted Asset4 ESG dataset to measure firms' environmental, social and governance performance (e.g., Ioannou and Serafeim, 2012; Kocmnova et al., 2011; Chen et al., 2012; Lam et al., 2012; Cheng et al., 2012; Wimmer, 2012).

Table 2.3 provides the definition and measurements of board attributes and CSR strategy variables used in Chapter 6.

Table 2.3 A break-down of governance pillar (Asset4 data fields)

Category	Definition/Measurement	DS Code
Board Structure and composition variables	Percentage of Independent Board Members (%) Percentage expressed numerically of independent board members as reported by the company (whereas the company stipulates that there is no significant institutionalised interest link between the company or the executives and the independent board members).	CGBSO07V
	Board Diversity (%) -Percentage of women on the board of directors.	CGBSO17V
	CEO-Chairman Separation (Y/N) Does the CEO simultaneously chair the board?	CGBSO09V
	Audit Committee Expertise (Y/N) Does the company have an audit committee with at least three members and with one of those members being considered a "financial expert" within the meaning of Sarbanes-Oxley given his or her extensive experience in accounting and auditing matters?	CGBFO03V
CSR related vision and strategy variables	Integrated Vision and Strategy Challenges and Opportunities (Y/N) Is the company openly reporting about the challenges or opportunities of integrating financial and extra-financial issues, and the dilemmas and trade-offs it faces?	CGVSDP016
	CSR Sustainability Committee (Y/N) Does the company have a CSR committee or team?	CGVSDP005
	CSR Sustainability Report Global Activities (Y/N) Does the company's extra-financial reporting take into account the global activities of the company?	CGVSDP029
	CSR Sustainability External Audit (Y/N) Does the company have an external auditor of its CSR/H&S/Sustainability report?	CGVSDP030
	GRI report guidelines (Y/N) Is the company's CSR report published in accordance with the GRI guidelines?	CGVSDP028

2.6 Conclusions

In conclusion, this chapter provides an introduction and some background knowledge about environmental and social responsibility. Relevant theoretical underpinnings and regulatory frameworks/policy guidelines are described. Furthermore, ESD and ESP measures used in this thesis are introduced. The

interrelationship among corporate environmental and social responsibility, governance systems and financial performance are reviewed in Chapter 3.

Chapter 3: Environmental and social responsibility, corporate governance and firm performance

3.1 Introduction

In the previous chapter, I discussed the theoretical frameworks and policy guidelines relating to environmental and social responsibility. I review in this chapter first, the extant empirical literature on the link between environmental and social responsibility and firm financial performance (which are the topics studied in the empirical chapters 4 and 5 of this thesis). I then review the studies grounded in the management and corporate governance literature, on the link between environmental and social performance and the board of director characteristics (the topic that I investigate in Chapter 6).

3.2 Environmental and social responsibility and firms' financial performance

A substantial body of literature has examined the link between 'being green' (i.e., being environmentally and socially responsible) and 'generating green' (i.e., generating profits), such as recent studies by Al-Tuwaijri et al. (2004), Clarkson et al. (2011), Callan and Thomas (2009), Brammer and Millington (2008), Dowell et al. (2000) and McWilliams and Siegel (2001). Yet, the evidence concerning this link remains inconclusive at theoretical and empirical levels. For example, Margolis and Walsh (2001) review 122 published studies between 1971 and 2001 and revisit the relation between corporate social responsibility and financial performance. Their review reveals that prior studies use many different approaches such as structural equation modelling, event study, regression analysis and case study. They find when CSR is an independent variable in 80 of the 95 studies, the majority of results point to a positive relationship between CSR and financial performance, namely 42 positive studies (65%), 4 negative studies (6%) and 19 neutral studies (29%). When CSR is a dependent variable in 19 of 95 studies, the majority of results point to a positive relationship, with 13 positive studies (68%), 3 neutral studies (16%) and 3 mixed result studies (16%).

Siegel (2009) argues that environmental and social responsibility should be viewed as an investment decision, and thus should be evaluated in a rational, calculative fashion. Siegel posits that managers should not adopt green

management practices because of societal pressure alone, but rather because it advances their organisation's strategic goals such as increase of their market values. In other words, firms should choose to be socially responsible to align their shareholders' interests with other stakeholders' interests, which in turn will increase firms' productivity, share price and market share, reduce potential competition and enhance human capital/work quality. Based on Siegel's argument, firms should choose to be 'green' only if it yields more 'green'. Indeed, Clarkson et al. (2011) find that it pays to be 'green'.

There are a number of limitations in the 'green' literature that might explain the mixed results of prior work. First, as Clarkson et al. (2010) point out, work in this area suffers from measurement and methodological problems. In terms of measurement, given the absence of clear mandatory guidelines as to what firms should report in terms of their corporate social responsibility (CSR), how studies measure CSR in this area varies greatly (Callan and Thomas, 2009). Second, given the data limitations of most prior work in this area: 1) using either cross-sectional samples (e.g., Callan and Thomas, 2009; Al-Tuwaijri et al., 2004); 2) limited industry samples (e.g., Clarkson et al., 2011 covering only 4 industries); 3) samples selected on the basis of meeting certain threshold criteria (e.g., Al-Tuwaijri et al., 2004, requiring companies in their sample to meet certain criteria relating to exposure to future environmental costs); not only does generalisation remain difficult, but even causality testing remains a challenge. Finally, as a number of authors including Ullmann (1985), and more recently Gray et al. (1995) comment, the literature remains unclear at a theoretical level as to why environmental and social responsibility, given that they are largely non-financial in nature, should matter for various measures of a firm's financial performance. For example, Ullmann (1985) provides a systematic review of the relations among social performance, social disclosure and economic performance, and indicates that inconsistent findings result from a lack of theory, inappropriate definition of key terms and deficiencies in empirical data currently available.

In the following section, prior studies regarding the three sets of relations as mentioned by Ullmann 1985 are reviewed. First, the link between environmental and social performance (ESP) and corporate financial performance (CFP) is discussed. Second, research on the relationship between ESP and ESD is

addressed. Finally, existing literature about the association between ESD and CFP is reviewed.

3.2.1 Relations between ESP and corporate financial performance (CFP)

The most dominant CSR research perhaps is the investigation of the link between ESP and CFP. Different methodologies have been used in prior studies. Generally speaking, existing literature indicates three different methods. First, event studies examine the mean stock returns of firms around release of CSR news. Second, portfolio studies compare firms' financial performance between CSR responsible firms and non-responsible firms. Third, regression analyses investigate the relation between ESP and CFP. Although studies use regression analyses (i.e., the third type), different ESP and CFP measures are used. For example, some studies test the influences of environmental and social performance on market based financial performance such as Q ratio or cost of capital (e.g., Clarkson et al., 2010). Some other studies apply accounting-based measurement of financial performance such as ROA, ROE and ROS (e.g., Callan and Thomas, 2009). The measurements of environmental and social performance also vary. For most US and Canadian studies, KLD is the main data source to measure firms' ESP. In the UK, there is limited ESP data available such as EIRIS and Asset4. In this thesis, I use Asset4 environmental and social scores to measure a firm's environmental and social performance.

In the following paragraphs, I will review separately the link between ESP and operating profitability, as well as ESP and market related performance in chronological order (although some studies use both as financial performance measures). Then review prior studies related to causality of this link.

3.2.1.1 Prior studies on the ESP-CFP link

ESP and operating profitability

As mentioned at the beginning of this chapter, a number of studies over the years have examined the link between various measures of environmental and social performance and operating profitability. The most recent studies are reviewed below.

Callan and Thomas (2009) use KLD data to examine the relationship between corporate social performance and its financial performance including four different financial performance measures, namely ROA, ROS, ROE and Tobin's Q i.e., Q ratio. When financial performance is the dependent variable, they find a positive link between financial performance (measured as ROA, ROS or Tobin's Q) and corporate social performance. They suggest that ROE is more suitable for long-term analysis, while Tobin's Q appears to be a useful measure of financial performance in CSR analyses. In chapter 4, I use ROS and ROE as profitability measures (independent variables) and in chapter 5 Q ratio is used as market performance measure (dependent variable).

Evans and Peiris (2010) examine the relationship between environmental social governance (ESG) factors and financial performance (both operating profitability and market performance) of US listed companies. Consistent with stakeholder theory, they find aggregated ESG rating is positively related to both ROA and MTB ratio. At disaggregated level, they find a significant positive link between particular ESG rating criteria and both return on assets and market to book value measures. In particular, they find that employment conditions are a more relevant influence than other stakeholder criteria, and a company's involvement in more general non-stakeholder related social issues (e.g., community relations) contributes negatively to both operating performance and stock return. Based on their findings, employee (key stakeholder) related social performance appears to be important for a company, as it can lead to higher operating profit and market return.

Guenster et al. (2011) investigate the association between firms' eco-efficiency and their financial performance measured as ROA and Tobin's Q. Using a new database of eco-efficiency scores (the eco-efficiency score reflects a firm's environmental performance) from 1997 to 2004, they find that eco-efficiency is positively related to operating performance and market value. Furthermore, they argue that the use of Tobin's q is adequate when analyzing corporate environmental performance, as it reflects reputational effects, investor trust and investor risk.

Busch and Hoffmann (2011) investigate the link between climate change/carbon emissions and financial performance measured by ROA, ROE and Tobin's Q

respectively. Focusing on climate change, they developed a set of questions that cover a firm's carbon emissions and carbon management strategies. They use a firm's carbon intensity, measured as the ratio of the total GHG emissions (Scope 1 and Scope 2 in tons) to a firm's sales (in US\$), as the outcome based environmental performance measurement. Regarding the process-based environmental performance measurement, they use the aggregated score of 13 questions from the questionnaire. They find a negative relation (with respect to Q ratio or ROE) when using carbon management as a process-based measurement. However, as an output-based measurement, environmental performance is positively linked with Q ratio.

Using longitudinal data from 1990-2003 for the four most polluting industries in the US, Clarkson et al. (2011) study the determinants and consequences of proactive environmental strategies. First, they investigate the factors effect a firm's decision to adopt a proactive environmental strategy. Second, they examine whether pursuing proactive environmental strategies can lead to better financial performance (ROA). Finally, by using 3SLS regression analysis, they test potential endogeneity between a firm's environmental performance and financial performance (equivalent to Q ratio). Clarkson et al. (2011) adopt resource-based view of the firm and argue that firms with unique scarce resources such as superior managerial capability and financial resources can gain sustainable competitive advantage. Managerial capability is captured by R&D intensity, sales growth and enterprise value to assets, and financial resources are measured by ROA, operating cash flows and leverage. They find that positive changes in firms' financial resources in the prior periods lead to significant improvements in firms' relative environmental performance in the subsequent periods. Furthermore, they find that significant improvements in environmental performance in prior periods can lead to improvements in financial performance (ROA) in the subsequent years after controlling for the influence of Granger causality. The result of 3SLS test shows that there is endogeneity between environmental performance and financial performance (Q ratio). Finally, they suggest that it pays to be green; however, only firms with sufficient financial resources and management capabilities can pursue a proactive environmental strategy.

To sum up, prior studies examining the link between corporate social performance and operating performance, show mixed results (e.g., Busch and Hoffmann, 2011). Moreover, there are some methodological limitations of the above studies. For example, some use either cross-sectional samples (e.g., Callan and Thomas, 2009) or limited industry samples (Clarkson et al., 2011). Furthermore, most prior studies focus on environmental performance only (e.g., Guenster et al., 2011; Busch and Hoffmann, 2011). However, the link between ESP and operating performance is widely studied, while the link between ESD and firm financial performance is under examined. In Chapter 4 I not only examine the link between ESD and firm operating profitability, but also use a pooled cross-sectional and time series sample including all non-financial industries to investigate the link between a firm's environmental (as well as social) disclosure and its operating performance. Hence, I address the under-researched link between ESD and profitability as well as address the methodological limitations of the ESP-CFP literature.

ESP and market related performance

The question of whether being socially responsible has any capital market implications, has been addressed by a number of studies. According to Ullmann (1985), socially responsive firms should outperform nonresponsive or less responsive ones, in terms of better market performance which should be reflected in the firm's stock price and attached systematic risk. In the following paragraphs, a number of prior studies examining the link between ESP and market related performance (including firm risk, cost of capital, annual return and Q ratio) are reviewed.

- Firm risk and cost of capital

Prior empirical studies attempt to investigate the relationship between corporate social performance and various firm risks. For example, Orlitzky and Benjamin (2001) define firm risk in terms of the variability of returns and they find a negative relation between social performance and subsequent firm risk.

There are two types of risk associated with a firm's stock: systematic risk and unsystematic or business risk (Weston and Brigham, 1981). Normally, business risk is irrelevant to financial theory, because a diversified portfolio of securities

can reduce and even eliminate business risk. However, a firm that successfully manages its business risk can provide above-normal returns to shareholders in the form of increased cash flows (Amit and Wernerfelt, 1990). Husted (2005) finds that the more proactive the CSR projects of the firm, the lower the ex-ante downside business risk of the firm. Husted's finding helps firms deal with ex ante downside business risk, which is dramatically different from most prior CSR-risk studies.

Lee and Faff (2009) examine the relationship between corporate sustainability performance and idiosyncratic risk from a global perspective. They find that firms with better corporate social performance exhibit significantly lower idiosyncratic risk which is priced by the broader global equity market.

Petersen and Vredenburg (2009) attribute the positive ESP-CFP link to four general areas: risk mitigation, generating market opportunities, accruing capital market advantages and serving as a proxy for quality management. Regarding risk mitigation, they state that CSR performance can be a form of insurance to hedge risks, reducing the exposure of the respective firms to specific risks. The mitigation of these risks is considered as value adding and therefore has a positive impact on financial performance.

Salama et al. (2011) use a sample of UK FTSE 350 firms covering 1994-2006 to investigate the link between corporate environmental performance and firm risk. Firm risk is measured by using beta, and corporate environmental performance is measured by using the Community and Environmental Responsibility Ranking from the 'Britain's Most Admired Companies' survey. They find that a firm's environmental performance is inversely related to its risk – an increase of 1.0 in a firm's environmental performance score is associated with a 0.02 reduction in its risk.

Recently, Gregory et al. (2011) adopt Linder Lydenberg Domini (KLD) data as CSR performance measure and find better CSR firms have a lower cost of capital and may have a lower expected adverse cash flow shocks. Their analysis of realized returns provides some evidence of lower beta and book-to-market exposure among high CSR stocks.

- Annual return and Q ratio

Some researchers theorize that firms with unique scarce resources such as superior managerial capability (e.g., with ability to develop superior CSR strategies) and financial resources can enhance their competitiveness, which could lead to better market performance (Al-Tuwaijri et al., 2004; Lo and Shue, 2007; Clarkson et al., 2011).

Based on this logic, Al-Tuwaijri et al. (2004) examine the relations among environmental disclosure, environmental performance and economic performance. Following Ullmann's (1985) suggestion that management's overall strategy can affect economic performance, environmental performance and environmental disclosure simultaneously, Al-Tuwaijri et al. (2004) recognize the potential for endogenous relations among these three constructs, and use a simultaneous equations approach to explore these relations. Economic performance is measured as industry-adjusted annual return (market price per share as sensitivity analysis). Environmental disclosure is based on information reported in SEC Forms 10-K and focuses on pollution-related information in four areas: 1) the total amount of toxic waste generated and transferred or recycled; (2) financial penalties resulting from violations of 10 federal environmental laws; (3) Potential Responsible Party (PRP) designation for the clean-up responsibility of hazardous-waste sites; and (4) the occurrence of reported oil and chemical spills. Environmental performance is measured as the ratio of toxic waste recycled to total toxic waste generated. They find a positive and significant relation between environmental performance and economic performance (dependent variable), as well as a positive and significant link between environmental performance and environmental disclosure (dependent variable).

Lo and Shue (2007) investigate the relationship between corporate sustainability and firm value using large US non-financial companies from 1999-2002. Firm value is measured by using Tobin's Q (dependent variable), and sustainability is measured as a dummy variable (1 if a firm is listed in the DJSGI USA in the current year or zero otherwise). Using both pooled and fixed effects regression analyses; they find a positive and significant relation between corporate sustainability and a firm's market value. Furthermore, they also find a

strong interaction effect between corporate sustainability and sales growth on firm value. Their findings indicate that companies with remarkable sustainable development strategies are more likely to be rewarded by investors with a higher valuation in the financial markets.

As reviewed earlier, both Callan and Thomas (2009) and Guenster et al. (2011) find a positive and significant link between ESP and Q ratio (dependent variable). Furthermore, using 3SLS regression analysis, Clarkson et al. (2011) find that there is a two-way relationship between environmental performance and economic performance (both positive). The link between environmental disclosure and economic performance (dependent variable) is found to be positive and significant. No endogeneity is found between environmental disclosure and economic performance.

To sum up, prior studies show that firms with better environmental and social performance have lower firm risk or cost of capital, but higher annual return or Q ratio. For example, Al-Tuwaijri et al. (2004), Callan and Thomas (2009) and Clarkson et al. (2011) find a positive relationship between a firm's market performance (annual return or Q ratio) and its corporate social performance.

However, Brammer et al. (2006) argue that expenditure on some corporate social activities can be largely destructive of shareholder value. From an aggregated level, they find a negative relation between CSR composite score and market returns. From a disaggregated level, they find environmental and community indicators are negatively associated with market returns, while employment aspect is weakly positively related. Hence, they suggest that the various aspects of corporate social behaviour should be examined separately in order to achieve an accurate picture of their impacts on market returns. Moreover, Nelling and Webb (2009) fail to find any significant link between a firm's corporate responsibility measures and their stock market performance. Hence, the evidence on ESP and market performance of a firm remains inconclusive at an empirical level.

Moreover, while the link between ESP and market performance is well established, the link of ESD with market performance needs to be explored. In Chapter 5, I will examine the relationship between a firm's ESD and its market performance.

3.2.1.2 Causality

There are a number of studies examining the link between CSR performance of a firm and its financial performance. The rationale for this link is unclear at a theoretical level, leading to inconsistent empirical results. On a conceptual level, while some researchers theorize that being environmentally and socially responsible, albeit in a strategic manner, could enhance a firm's competitiveness and lead to superior profits i.e., instrumental/strategic CSR (Porter and van der Linde, 1995; Porter and Kramer, 2006); others drawing upon the resource based view of the firm (Hart, 1995; Russo and Fouts, 1997), argue that firms having unique scarce resources such as superior managerial and financial resources i.e., higher profits could afford to be environmentally and socially responsible. At this point, it is worth mentioning the slack resource theory. Slack resource theorists argue that better financial performance potentially results in the availability of slack (financial and other) resources which could provide the opportunity for firms to invest in socially responsible activities such as environment, community relations and employee relations. In other words, if slack resources were available, better social performance would result from the allocation of these resources into the social activities. McGuire et al. (1988) provide some empirical evidence of slack resources theory, and find that a firm's prior performance (both stock-market returns and accounting-based measures) is more closely related to corporate social performance than is subsequent performance. Furthermore, Hammond and Slocum Jr. (1996) state that slack resources such as excess profits provide opportunities for a firm to invest in more socially responsible behaviours that satisfy stakeholder expectation. Those firms without slack resources are at an economic disadvantage and have fewer resources available to invest in social responsibility related activities. Thus better financial performance could be a predictor of better environmental and social performance.

Depending upon the theoretical stance adopted, empirical work has tested both of these theoretical propositions. However, it is not clear in the literature, whether CSR performance leads to better financial performance or the other way around (reviewed by Margolis and Walsh, 2001&2003). The potential causality remains unclear (as mentioned by Siegel and Vitaliano, 2007 and Siegel, 2009).

Makni et al. (2008) use simple Granger causal model to examine the causal relationship between corporate social performance and financial performance. Their empirical analyses are based on a sample of 179 publicly listed Canadian firms covering 2004 and 2005. Social performance data is collected from Canadian Social Investment Database, and financial performance is measured by using ROA, ROE and market returns. They find no significant relationship between the composite measure of CSP and corporate financial performance (except for market returns). However, using individual measures of CSP, they find a robust and significant negative impact of the environmental aspect of CSP on all financial performance measures. They state that from a short-term perspective, this is consistent with trade-off theory and negative synergy hypothesis. The trade-off hypothesis supposes a negative impact of CSP on FP, supports that socially responsible behaviour will net few economic benefits but its numerous costs will reduce profits and shareholder wealth. The negative synergy hypothesis supposes that higher levels of CSP lead to decreased FP, which in turn limits the socially responsible investments.

Callan and Thomas (2009) assume the relation to run from corporate social performance to financial performance. Drawing upon the collective consensus of a number of previous studies, as reviewed by Margolis and Walsh (2001), they argue for and find a positive relation between corporate social performance and corporate financial performance. However, their sample being cross-sectional does not allow for causality testing.

Nelling and Webb (2009) adopt Granger causality models to examine the relation between CSR performance and financial performance using KLD data. Their findings suggest that strong stock market performance leads to greater firm investment in aspects of CSR programme related to employee relation, but social responsibility activities do not affect financial performance.

Emerging evidence presented in recent studies (e.g., Clarkson et al., 2011 and Arora and Dharwadkar, 2011) suggests that more profitable firms (i.e., those having sufficient financial resources/slacks) are more likely to engage in CSR activities. Clarkson et al. (2011) adopt the resource based view of the firm theory and find that positive changes in firms' financial resources in the prior periods lead to significant improvements in firms' relative environmental

performance in the subsequent periods. Furthermore, they find that significant improvements in environmental performance in prior periods can lead to improvements in financial performance (ROA) in the subsequent years after controlling for the influence of Granger causality. The result of 3SLS test shows that there is endogeneity between environmental performance and financial performance (Q ratio).

To sum up, while some prior work (including Callan and Thomas, 2009) assumes the causality to run from corporate social performance to corporate financial performance, other studies find mixed results. Furthermore, while the causality between ESP and CFP has been tested, the corresponding analysis for ESD and CFP is lacking. In this regard, Brammer and Pavelin (2008) suggest that future research should investigate the causality between ESD and CFP. Accordingly, the causality between ESD and CFP will be studied in Chapter 4.

3.2.2 Research on the link between ESP and ESD

Another stream of literature examines the relationship between ESP and ESD. Environmental and social disclosures can be a means of communicating and offering accountability to the various stakeholders about how a firm has addressed its environmental and social responsibility. Debate on whether these disclosures do indeed reflect a firm's actual environmental and social performance or whether they are just an attempt at green washing, has also been on-going in the literature. While there is a body of theoretical and empirical work on this topic which suggests that disclosures have been largely an attempt at green washing, driven by a response to public and policy pressure and aimed at legitimizing a firm's operations (e.g., Patten, 1991, 2002a, 2002b; Cho and Patten, 2007); others have also argued and shown a positive link between a firm's disclosures and its environmental performance (e.g., Al-Tuwaijri et al., 2004; Clarkson et al., 2008, 2011). In the following two sections, I review the empirical evidence on the link between ESD and ESP based on the two competing theoretical arguments discussed in the preceding chapter.

Empirical research based on legitimacy theory

As reviewed in Chapter 2, Legitimacy theory implies a reactive or proactive approach of companies to provide voluntary ESD. On the one hand, firms can

voluntarily disclose any positive environmental and social information to inform stakeholders about their intentions to improve their environmental and social performance. On the other hand, when firms' environmental and social activities threaten their legitimacy, they can provide extra environmental and social information to influence stakeholders' perceptions about their negative performance without changing actual behaviour. Hence, firms can use disclosure as a legitimizing tool, implying a negative relationship between ESD and ESP.

Patten (2002a) examines the relationship between environmental disclosure and environmental performance for a sample of 131 US companies. Environmental disclosure (dependent variable) is based on firms' annual reports in 1990 (i.e., content analysis of 8 indicators and also report line counts). Environmental performance is measured as the ratio of a firm's specific amount of toxics released to revenue (both data are for the year 1988). After controlling for firm size and industry classification, Patten finds a negative and significant link between environmental disclosure and environmental performance. However, Patten also finds that the disclosure level of firms from non-environmentally sensitive industries is more affected by toxic release levels than is the disclosure of firms from environmentally sensitive industries.

Contrary to Patten's finding, Campbell (2003) selects 10 firms (out of the FTSE 100 companies) from 5 different industries between 1974 and 2000, and examines the intra- and inter-sectional effects on environmental disclosure drawing on legitimacy theory. The findings show that firms that are more environmentally sensitive tend to disclose more environmental information in their corporate reports than firms that are less environmentally sensitive. Furthermore, the findings indicate that firms within sectors broadly agree on the approximate level and direction (increase, decrease or no change) of environmental disclosure, but agreement is rarely resolved at the year-to-year level. Campbell's study has provided limited evidence of legitimacy theory related arguments to environmental disclosure. However, small sample size and limited industry groups are key limitations of this study.

Cho and Patten (2007) criticised previous studies for not controlling for firm size and industry classification. They use size-matched groups based on industry

membership (environmentally sensitive versus non-environmentally sensitive) and environmental performance (worse performers versus better performers) to test for differences in the use of monetary and non-monetary non-litigation related environmental disclosure. Environmental performance is based on KLD 2002 environmental concern ratings (firms with no environmental concern are labelled as better environmental performers). Similar to Patten (2002a), environmental disclosure is based on 2001 10-K report for each firm (content analysis of 8 indicators with two sub-components: monetary and non-monetary indicators). Their findings reveal a significant and negative relationship between voluntary environmental disclosure and environmental performance, which is consistent with legitimacy-based theory (i.e., use disclosure as a legitimizing tool).

Empirical research based on economics voluntary disclosure theory

Economics based voluntary disclosure theory indicates that firms should be willing to provide voluntary ESD (particularly hard and objective information) for investors to differentiate their firm types. In other words, good firms should be willing to provide more ESD (that is costly), which is difficult for poor firms to mimic.

As reviewed earlier, Al-Tuwaijri et al. (2004) examine the relations among environmental disclosure, environmental performance and economic performance. After controlling for endogeneity, they find a positive and significant link between environmental performance and environmental disclosure (dependent variable).

Clarkson et al. (2008) draw on both economics based voluntary disclosure theory and socio-political theories and investigate the relation between firms' environmental performance and environmental disclosure to see which theory is supported. Environmental disclosure data is collected from firms' sustainability reports or websites. A refined disclosure index is developed based on GRI guidelines published in 2002. They focus on purely discretionary disclosure (i.e., data is collected from voluntary disclosure sources such as sustainability reports or websites), which is helpful in analysing the propensity and quality of voluntary disclosure. Environmental performance is measured by the total toxic waste that is treated, recycled or processed as a percentage of the total toxic

waste generated by each firm (% recycled), as well as the ratio of TRI to firm sales. Using a sample of 191 firms from the five most polluting industries in the US, Clarkson et al. (2008) find a positive association between environmental performance and the level of discretionary environmental disclosures. Overall, their findings support economics based voluntary disclosure theory, but with little support for socio-political theories. In other words, they find that firms with better environmental performance tend to disclose more 'hard and objective' voluntary environmental information, which is difficult for poor environmental performance firms to mimic (i.e., disclosures differentiate firm types).

In addition, by using 3SLS regression analysis, Clarkson et al. (2011) find a two-way relation between environmental disclosure and environmental performance. In other words, firms with more environmental disclosure tend to be better environmental performers, and better environmental performers tend to disclose more environmental information.

These latest findings are in line with recent suggestions in the literature that society's views about corporate accountabilities have changed with concomitant changes in corporate disclosure policies (Deegan, 2004). Recently, Jones and Solomon (2010) find some empirical evidence from interviews with CSR representatives from 20 UK listed companies on whether they consider social and environmental reporting assurance (SERA) to be necessary, which is the first research into the SERA that adopts an interview method. They find that half of the respondents believe external SERA would enhance credibility and trust, while the other half believed that external SERA was not necessary but internal assurance was sufficient. They find the reason is that the respondents saw SERA as predominantly a managerial tool for checking the efficiency of internal management control systems, rather than as a mechanism for enhancing corporate accountability to stakeholders and building credibility and trust. However, they suggest that perhaps SERA should act as a means of furthering the dialogic relationship between companies and their stakeholders. Furthermore, if the SERA function involves stakeholders in verifying companies' environmental and social responsibility, then a closer and more accountable relationship will be nurtured through SERA.

To sum up, mixed results have been found in previous literature examining the link between voluntary environmental disclosure and environmental performance (e.g., Patten, 2002a; Al-Tuwaijri et al., 2004; Cho and Patten, 2007; Clarkson et al., 2008). Chapter 5 will further test this link, namely the relationship between environmental disclosure and a firm's carbon eco-efficiency, the latter used as a measure of environmental performance. In addition, a test between social disclosure and social performance as measured by employee productivity will also be carried out.

As indicated by prior studies, the availability of environmental or social disclosure data is a key constraint in disclosure literature, which has resulted in a smaller sample size or sample selection bias in prior studies. For example, when disclosure data is collected by hand, only large firms are included such as FTSE 100 (Henriques, 2010), or heavy polluting industries are selected such as oil & gas, utilities and chemicals industries (Clarkson et al., 2008), or even smaller sample of firms are included such as two firms from five industrial sectors (Campbell, 2003). Furthermore, Brammer and Pavelin (2008) also suggest that *"Our study, in common with much of the empirical work in the area conducted in the UK, would benefit from improved availability of data, particularly regarding corporate environmental performance"* (p.134). Brammer and Pavelin (2008) choose the ratio of aggregated level of fines incurred for environmental transgressions over 4 years' period to firms' total assets as environmental performance measurement. However, Clarkson et al. (2008) argue that the proxies for environmental performance are more appropriate, as they are the actual pollution discharge data published by local Environmental Protection Agency. In chapter 5, I adopt similar environmental performance measurement as Clarkson et al.'s (2008) (i.e., the ratio of carbon emission to total sales). Social performance is captured by employee productivity (based on the theoretical arguments of Siegel, 2009). From an economic/strategic perspective on green management practices, Siegel (2009) argues that firms can use environmental and social related tactics to achieve their strategic goals such as increase of employee productivity and share price. One such tactic could be the use of social disclosures to improve employee morale and productivity. Hence, I test the link between social disclosures and employee productivity.

3.2.3 Research on the link between ESD and CFP

From an economics perspective, producing high quality objective disclosures entail costs (Brammer and Pavelin, 2008; Buhr, 2002; Li and McConomy, 1999). However, in line with the predictions of the voluntary disclosure theory (Verrecchia, 1983), recent research shows that they also entail benefits particularly in the form of reducing the information asymmetry between the firm and its investors (Cormier et al., 2011). To date however, research has failed to establish a clear link between a firm's environmental and social disclosures and various measures of its financial performance. In Chapter 4 and 5, I will re-investigate this link.

The measurement of corporate environmental and social disclosures is important when examining the relation between ESD and CFP. Since environmental and social disclosures are voluntary, there is no unifying format of reporting. Index approach is a common method used to codify ESD, especially for environmental disclosure measurement (e.g., Wiseman, 1982; Patten, 2002a; Clarkson et al., 2008; Cormier et al., 2011). There are arguments about the choices of disclosure indicators and scoring bias. However, focusing on the quality of firms' voluntary disclosures, this seems to be an appropriate method. For example, Clarkson et al. (2008) use GRI guidelines and develop a comprehensive environmental disclosure index which enables them to examine disclosure quality (i.e., disclosure of individual indicator). Gray et al. (1995) use an index approach and construct a research database including social and environmental information provided by UK firms covering 21 years (1979-1999). Due to time and labour constraints, their data is only available up to year 1999. As mentioned in the previous chapter, in this study, a more recent database namely Bloomberg disclosure scores is used for measuring corporate environmental and social disclosures. In the following section, prior studies regarding the ESD-CFP link (both with operating profitability and market measures of performance) are reviewed in chronological order.

ESD and operating profitability

Exploring the determinants of a firm's environmental disclosures, a number of studies have examined the link between a firm's environmental disclosures and

its profitability (e.g., Freedman and Jaggi, 1988; Patten, 1991; Brammer and Pavelin, 2008) with overall inconclusive results.

Freedman and Jaggi (1988) examine the relationship between pollution disclosure and economic performance for four highly polluting industries. Economic performance is measured by using six profitability measures including ROA, ROE and other operating performances. A pollution disclosure index is developed to measure the extensiveness of disclosures. No significant relation is found regarding this link for full sample of companies. However, when the sample is segmented by industry group, they find a significant and positive correlation between pollution disclosure and operating performance for oil industry. Furthermore, they also find that large firms with poor operating performance provide more pollution information. For smaller firms, no association between the two variables is found.

Patten (1991) investigates whether the voluntary social disclosures included by companies in their annual reports are related to either public pressure or firm profitability. The sample consists of 128 Fortune 500 listed companies from eight industries in 1985. Social disclosure (dependent variable) is based on firms' annual reports in 1985. Public pressure is captured by firm size and industry classification. Profitability is measured by using ROA, ROE, five year average ROE, one year lagged ROA, and a dummy variable indicating firms reporting a decrease in net income from the previous period. Patten finds that firm size and industry classification (public pressure variables) are significant explanatory variables of voluntary social disclosures. However, profitability variables are not significantly linked with social disclosures.

Recently, Brammer and Pavelin (2008) investigate the influences of different factors on the quality of firms' environmental disclosure for a sample of 447 UK companies, including the relationship between environmental performance and environmental disclosure. Disclosure data is collected from the PIRC Environmental Reporting 2000 survey. Environmental performance is measured as the ratio of aggregated level of fines incurred for environmental transgressions over 4 years' period to firms' total assets. They find a firm's record of environmental fines has no significant effect on its propensity to disclose an environmental policy, but it does exert a significant positive effect on

the likelihood that a firm will disclose improvements, targets and environmental audit information. In other words, poor performers tend to disclose more environmental information related to their environmental improvements, targets and audit. They also find firm size is positively and significantly linked with all components of environmental disclosure, and media exposure is positively and significantly associated with some aspects of environmental disclosure. No significant relation is found with respect to other factors such as leverage or firms' profitability. While Brammer and Pavelin (2008) include various control variables and lagged variables to avoid endogeneity problem, they recommend that future studies should use longitudinal data and examine the causality between these variables particularly profitability and disclosures. In Chapter 4, I will first examine the association between ESD and operating profitability and then examine potential causality between ESD and operating profitability.

ESD and market based financial performance

From a capital market's perspective, public disclosures of how a firm addresses its environmental and social challenges can have significant financial implications. To the extent that these disclosures reveal a firm's current environmental and social performance as well as its future potential, investors can gauge how well the firm is currently managing its environmental and social risks, and how well it is equipped to tackle these in the future. Hence, investors can value the firm accordingly. Scholars have examined the link between ESD and measures of market performance using different methodologies.

One group of studies uses event study methodology to assess financial impact, when firms engage in either socially responsible or irresponsible acts and provide relevant information. For example, Shane and Spicer (1983) study the stock market reaction to the negative environmental publicity received by firms which feature in the Council of Economic Priorities (CEP) reports in the US. Consistent with their expectations, they find a negative abnormal return for these firms on day t-1 and t-2 of the event date t. Moreover, Lorraine et al. (2004) examine whether publicity (either good or bad) about environmental performance (i.e., fines for environmental pollution and commendations about good environmental achievements) affects companies' share prices for a sample of 32 events in the UK. They find that while the market ignores good

news, it does react to news about fines particularly to relatively high fines, for up to one week post release of the news. In addition, Freedman and Patten (2004) examine the reaction of the market to revisions in the Clean Air Act in 1989 in US, and find that companies which disclosed higher levels of size-adjusted toxic releases into the air suffered more negative market reactions than companies with better performance. However, they also find that this effect is mitigated for firms which made larger financial report environmental disclosures (i.e., this negative impact is reduced for firms which make higher and detailed environmental disclosures in their annual reports).

Murray et al. (2006) carry out a longitudinal study using an environment and social disclosure database (covering 1988-1997) provided by CSEAR to investigate the relationship(s) between environmental and social disclosures and UK largest firms' financial performance. They find no direct relationship between share returns and environmental and social disclosures. However, they reveal a convincing relationship between consistently high returns and the predilection to high disclosure. There is some empirical evidence showing that firms with higher environmental (social) disclosures tend to have lower analysts' forecast dispersion. Aerts et al. (2008) investigate the information dynamics between corporate environmental disclosure (both print-based and web-based information), financial markets (as proxied by financial analysts' earnings forecasts) and public pressures (as proxied by a firm's media exposure). The sample consists of companies from continental Europe and North America. Using 3SLS regression analysis (i.e., controlling for endogeneity), they find that enhanced environmental disclosure can lead to more precise earnings forecasts by analysts, suggesting that such disclosures reduce the information asymmetry between the firm and the stock market participants. Such effect is reduced for companies with extensive analyst following and in environmentally sensitive industries. Moreover, these relationships are shown to be starker in Europe than in North America. They find most observed relationships hold for either print- or web-based disclosure, except for North America in which web-based disclosure seems to have no influence on analysts' forecasting work.

Ducassy and Jeannicot (2008) examine how CSR information affects investor's behaviour using an event study approach. They find a significant market response to the publication of social reporting rankings generated by the CFIE

(Centre Français d'Information des Entreprises). The most significant impact is observed not for high-ranking firms, but for those having risen or regressed the most in rank since the prior year. Their findings indicate the importance that investors attribute to firms' CSR dynamics. Furthermore, Becchetti et al. (2009) use a sample of 278 US firms from the Domini 400 Social Index between 1990 and 2004. The results show that the impact of social responsibility-related information (e.g., additions and deletions from the Domini Index) has risen over time. The abnormal returns around the event data are significantly negative in case of exit from the Domini Index. The result is robust to the adoption of different (non)parametric methods – after considering stock market seasonality, changes in the estimation window or the event window, changes in the model used for estimating abnormal returns (i.e., market model and CAPM multi-factor model), and after controlling for financial distress shocks.

Clarkson et al. (2010) examine the impact of voluntary environmental disclosure on cost of equity and firm value, controlling for firms' environmental performance. Using a sample of firms from five most polluting industries in the US, they find voluntary environmental disclosure is incrementally informative for investors and show a negative association between TRI emission⁶ and firms' valuation. However, the relation between firms' cost of equity capital and voluntary environmental disclosure is not significant. They run robustness tests and suggest that voluntary environmental disclosure plays an important role in predicting expected future cash flows (profitability) but not for assessing the riskiness of these cash flows i.e., the cost of equity capital. Furthermore, Clarkson et al. (2011) use 3SLS regression analysis and find a positive and significant association between environmental disclosure (dependent variable) and economic performance (equivalent to Q ratio). However, they do not give a clear theoretical rationale for why environmental disclosures should be affected by the market value of the firm rather than the other way round.

Dhaliwal et al. (2011) investigate the relationship between corporate social reporting and cost of equity capital. They find that firms with higher cost of equity capital in prior year tend to initiate disclosure of social responsibility activities in the current year, and the initiating firms with superior social responsibility performance have lower cost of equity capital in the subsequent

⁶ Toxic emissions data, the higher TRI indicates worse environmental performance.

year. They also find some evidence that firms initiating social responsibility disclosure with superior social performance attract dedicated institutional investors and analyst coverage.

Studies discussed above suggest that environmental disclosures do have capital market implications, however not only are the results of various studies mixed but are biased towards a negative reaction to adverse environmental disclosures. These results are quite contrary to the expectations that higher and more objective factual disclosures should help reduce the information asymmetry between a firm and its investors. The first study to offer some evidence consistent with this argument is by Cormier et al. (2011). Specifically, Cormier et al. (2011) investigate whether social disclosure and environmental disclosure reduce information asymmetry between managers and stock market participants, and if so, are they complement or substitutes in reducing this asymmetry. The measurement of social and environmental disclosure is based upon a coding instrument that makes some explicit assumptions about the value and relevance of information (39 indicators divided into six categories). Information asymmetry is captured by share price volatility and bid-ask spread. Their findings suggest that social disclosure and environmental disclosure reduce the information asymmetry and act as substitutes. They suggest that future research should distinguish between social and environmental disclosures. In this thesis, I extend Cormier et al.'s (2011) work by analysing the impact of environmental and social disclosures on firm market value, arguing that if such disclosures do reduce information asymmetry then they should have a positive link with firm market value. Moreover, in line with Cormier et al.'s (2011) suggestions, I analyse the impact of environmental and social disclosures separately on firm value.

In the following section, relevant studies investigating the relationship between environmental and social responsibility and corporate governance will be reviewed. This review sets the context for the analysis of Chapter 6, which examines the link between board attributes, board CSR strategy and corporate environmental and social performance.

3.3 Environmental and social responsibility and corporate governance

Orlitzky et al. (2011) provide a review of recent theoretical and empirical evidence on strategic implications of CSR, including the link between leadership and CSR, and the association between CSR and economic/financial performance. They suggest that strategic leadership should be incorporated into CSR research. They review three theoretical approaches to strategic corporate social responsibility, namely cost-benefit analysis, transaction cost economics and recourse-based view of the firm, and posit that voluntary CSR actions can enhance a firm's competitiveness and reputation. Hence, the end result of CSR activities should be an improvement in financial and economic performance. Based on an overview of recent empirical evidence, they conclude that economic theories of strategic CSR have the greatest potential for advancing CSR studies. In the following paragraphs, first, the link between corporate governance (CG) and CSR is introduced. In this context, strategic CSR is further explored; particularly the roles of boards of directors in leading firms' CSR strategy and performance are reviewed. Finally, the association between firms' CSR strategy and their environmental and social performance is discussed.

Link between CG and CSR

With the widening remit of corporate governance to include corporate responsibilities towards not only the shareholders but also other stakeholders of the firm (Aguilera et al., 2007; [UK] Companies Act, 2006; Jensen, 2010; UK Corporate Governance Code, 2010), a few studies in recent years have examined the link between various governance mechanisms and corporate social responsibility.

A notable study by Jamali et al. (2008) examines the link between corporate governance (CG) and corporate social responsibility, using in-depth interviews with top managers from eight companies in Lebanon. They develop three sets of interview questions based on prior literature review: 1) about corporate governance, 2) about corporate social responsibility, and 3) about the conception of CG-CSR relationship. From broader conception of corporate governance, Jamali et al. (2008) find that there is a clear overlap between CG

and stakeholder conception of CSR. Both CG and CSR call on companies to assume their fiduciary and moral responsibilities towards stakeholders. They also find that there is a two-way relationship (i.e., CG and CSR should not be considered and sustained independently). CG is not entirely effective without a sustainable CSR drive, because a company has to meet various stakeholders' needs in order to create value for its shareholders. Furthermore, they find that good CG is increasingly considered as a necessary and foundational pillar for a genuine and sustainable CSR orientation.

Recently, Jo and Harjoto (2012) investigate the causal effect of corporate governance on corporate social responsibility, using a large sample of US companies during the period from 1993 to 2004. They propose two hypotheses, namely the overinvestment hypothesis based on agency theory and the conflict resolution hypothesis based on stakeholder theory. Jo and Harjoto (2012) use KLD data to measure CSR and IRRC governance data to measure CG including insider blockholder ownership, board independence, outside institutional ownership, and the number of analyst following a firm. Using both Heckman (1979) two-stage estimation procedure and instrumental regression methods, they find that while the lag of CSR does not affect CG variables, the lag of CG variables positively affects firms' CSR engagement, after controlling for various firm characteristics. This finding suggests that direction of causality is likely to run from CG to CSR rather than the other way round. Furthermore, after correcting for endogeneity bias, they find that CSR engagement is positively linked with CFP, which supports the conflict resolution hypothesis based on stakeholder theory rather than the CSR overinvestment hypothesis. Overall, their findings suggest that good governance leads to positive CSR which is also beneficial for a firm's long run economic sustainability. In the following section, I review in greater detail the literature on the role of one specific governance mechanism, that is the board and its link with corporate social performance.

3.3.1 Board attributes and firms' environmental and social performance

Studies examining the link between various board attributes and corporate social performance have generally drawn upon management and corporate governance literature, particularly from the stakeholder and legitimacy perspective (Webb, 2004; Aguilera et al., 2006) and the resource dependency

perspective (Pfeffer and Salancik, 1978; Hillman et al., 2000) respectively. From legitimacy perspective, the reputation of company's directors in the community and among stakeholders enables the company to carry on its business and actions, mobilise external support and resources, and enhance organisational legitimacy (Provan, 1980; Deephouse, 2000).

Based on resource dependence theory, boards can be a solution to external CSR challenges. Hence, by establishing external ties with stakeholders and the wider society, directors are able to attract and retain precious resources to enhance the organisational legitimacy (Zahra and Pearce, 1989). According to Hillman et al. (2000), most research on corporate directors has focused on two roles: agency and resource dependence. From the agency theory perspective, the board of directors, particularly the outside directors on the board, can be seen as the monitors with the role to oversee that the company is run effectively to achieve long term financial success. From the resource dependency perspective, the board of directors can be seen to itself provide, as well as help a firm secure access to critical resources that enable it to meet external challenges including the environmental and social challenges. Using a sample of US airline firms, Hillman et al. (2000) examine the resource dependence role of directors. That is, examine how board composition changes with the changing resource dependence needs of the firm. They find that board's function as a link to external environment is an important one, and firms respond to significant changes in their external environment by changing board composition.

Johnson and Greening (1999) investigate the effects of corporate governance captured by the number of outside directors on a company's board and the institutional ownership types on two dimensions of corporate social performance; namely, people dimension (women and minorities, community and employee relations) and product quality dimension (product and environment). Johnson and Greening argue that because outside directors are hired to act as control experts and to help manage external constituencies, they are likely to act in the best long-term interests of shareholders by encouraging the development of quality products and by helping a company to maintain a positive environmental reputation. Indeed, they find evidence that outside director representation is positively linked with both people and product dimensions of CSR. Furthermore,

they also find various types of institutional ownership have different effects on corporate social performance. For example, top management equity is only positively linked with the product quality dimension of CSP. They suggest future research should use disaggregated measure of CSP, as the influences of governance mechanisms on each CSP dimension may be different. Thus environmental and social responsibility is divided into two separate dimensions of CSR in this thesis.

Webb (2004) investigates the structure of the board of directors at socially responsible firms. Using two-sample paired t-test and regression analyses, she finds a few (out of 16) board structure characteristics are significant at socially responsible firms compared to a matched sample. Particularly, the percentage of outside directors, women on the board and board size are significantly different between social responsible and non-responsible firms. Webb (2004) also finds that socially responsible boards are more likely to have a CEO who is not also the chairman of the board.

Mallin and Michelon (2011) investigate the relationship between board attributes and corporate social performance using a sample of 100 US companies listed in the Business Ethics 100 Best Corporate Citizens from 2005-2007. Drawing upon the legitimacy and resource dependence theories, they argue that boards as providers of both human and relational capital enhance a firm's reputation, by having relationships with external environment and by providing insightful advice to top management about stakeholders' expectations. Using KLD data (to measure corporate social performance) and several governance-related variables, including board independence, board diversity (as measured by percentage of women on board), duality, presence of CSR committee, and number of directorships of non-executive directors (as measure of their community influence), they find a positive link between a number of board variables including board independence, board diversity and corporate social performance. Furthermore, they also find negative effects of CEO duality and the number of directorship of community influentials on CSP.

More recently, Post et al. (2011) investigate the link between boards of directors' composition and environmental corporate social responsibility. Using disclosed company data and the natural environmental ratings data from KLD for 78

Fortune 1000 companies, they find that firms with higher proportion of outside board directors and with boards composed of three or more female directors tend to have higher KLD strengths scores. That is, firms with more independent and diverse board members tend to have better environmental performance.

While prior studies on board attributes and measures of corporate social performance have found rather consistent results with respect to some board attributes particularly the presence of independent directors and women on the board, these studies are constrained by sample size (e.g., Webb, 2004) as well as selection (e.g., Mallin and Michelon, 2011). Also most prior studies ignore the issue of endogeneity between the board attributes-firm performance link (Adams et al., 2010) which is likely to constrain the interpretation of such studies. In chapter 6, using a much larger and diverse sample of firms, the link between a wide array of board attributes and firms' environmental and social performance is tested while controlling for the potential endogeneity of this link.

3.3.2 Board role in leading CSR strategy

The way boards are structured is vital to addressing strategic issues, developing policies and ultimately governing firms (Galbreath, 2010). Developing and implementing the appropriate vision and strategy of firms, including their environmental and social strategy, is the function of corporate board (Ho, 2005; Mackenzie, 2007). As also stated by the Combined Code (2003) on Corporate Governance (s 172), directors should consider both shareholders and other stakeholders to meet their expectations. Goodstein and Boeker (1991) propose that boards of directors may directly and indirectly affect strategic decisions on a firm's products and services. One common denominator is an emerging view that a board's failure to address important CSR concerns may increase a firm's financial and reputational risk. Recognizing the role of the board in setting the strategic vision and direction of the company, including in terms of addressing wider stakeholder expectations, a few studies recently have started exploring both on a theoretical as well as empirical level, the remit of corporate governance in terms of corporate social responsibility.

Ho (2005) examines the link between corporate governance and corporate competitiveness. Using a holistic approach, Ho finds the more a firm conforms to good corporate governance, the stronger is the firm's competitiveness.

Corporate competitiveness is captured by 18 financial indicators such as sales per employee, ROA and market capitalization etc. Corporate governance is captured by using a questionnaire of 116 indicators on a 7-point Likert scale (that is board structure, stewardship, strategic leadership, capital concentration, managing capital market pressure, discharging social responsibilities, and all factors). Data is collected from top executives of international companies (about their conformance to good corporate governance practices and their perceptions of the competitive conditions of the companies). Ho argues corporate governance attributes are inter-related. Based on the results of correlation analysis, Ho presents the inter-relationships among governance variables related to board structure, strategic leadership and corporate social responsibility: 1) there is a positive and significant relation between board structure and strategic leadership; 2) a positive and significant link between board structure and discharging social responsibilities; and 3) a positive and significant association between strategic leadership and discharge social responsibilities. It is worth noting that Ho assumes that social responsibility is part of corporate governance.

Mackenzie (2007) draws on the economic literature i.e. market failure (e.g., information asymmetry, absence of competition and costs of a transaction are external to the company) and internal incentives structure (e.g., board's failure to address/change his performance objectives) to analyse the primary causes of CSR breaches. Mackenzie posits company boards are key participants in ensuring firms meet CSR standards. By collecting survey data of board practice (including roundtable discussions by board directors, interviews with board directors, company secretaries and CSR managers, and observations of actual board meetings) from 20 large UK FTSE 100 listed companies, Mackenzie finds that company boards could ensure compliance with CSR standards by addressing incentive problems from market failure and their own incentives/performance management systems, especially the roles that CSR committees play in the process. Mackenzie suggests that boards should re-orientate their activities in terms of establishing board policies supporting government action on relevant CSR issues and overseeing implementation of these policies. For example, Mackenzie (2007) finds some boards have started to balance financial incentives with incentives to support responsible behaviour,

e.g., introducing occupational health and safety targets into executive incentives or adopting a more systematic balanced scorecard approach to executive remuneration, which indicate a significant shift in focus away from short-term financial goals to long-term value creation. *“After all, the central point of the economics arguments about market failure is that exploiting market failure is a strategic opportunity for business. So a board discussion motivated solely by strategic considerations may very well lead a company to exploit market failures and resist regulatory interventions, rather than to exercise self-restraint”* (Mackenzie, 2007, p.941). Hence, Mackenzie’s (2007) findings suggest that firms’ boards play an important role in directing their CSR vision and strategy.

Galbreath (2010) uses a cross-country Ceres (Coalition for Environmentally Responsible Economies) data on 100 firms (76 US and 24 non-US), and examines the relation between board structure variables and a company’s proactive strategic posture in terms of corporate governance practices towards addressing the challenge of climate change. Board variables in his analysis include board size, CEO duality, director age, gender proportion, and outsider representation. Governance practices addressing climate change cover five aspects: 1) board oversight (i.e., whether a board committee has explicit oversight responsibility for environmental affairs); 2) management execution (i.e., whether executive officers’ compensation is linked to attainment of environmental goals and Green House Gas (GHG) targets); 3) public disclosure (i.e., whether securities filings identify material risks and opportunities posed by climate change, and whether sustainability report offers comprehensive, transparent presentation of company response measures); 4) emission accounting (i.e., whether company has third party verification process for GHG emission data); and 5) strategic planning (i.e., whether company pursues business strategies to reduce GHG emissions, minimize exposure to regulatory and physical risks, and maximize opportunities from changing market forces and emerging controls). Galbreath finds evidence that some board variables including board size and independent board chair are associated with firms having better governance practices related to climate change. Given the limited sample size and the exploratory nature of his study, he suggests future research should explore further the relationships between corporate governance practices, climate change, institutional environments and board

structure, particularly in industries other than energy, manufacturing and transport.

Focussing on the board's strategic role in addressing the challenges of climate change in the electric utilities industry in US, Ortiz-de-Mandojana et al. (2012) examine how director interlocks affect a firm's ability to adopt a proactive environmental strategy, using a sample of 90 US electric utilities companies in 2005. Proactive environmental strategy is defined as the decision to make voluntary investments in renewable systems of energy generation. Director interlocks variable is captured by the number of interlocking ties with other companies. Consistent with the resource dependency argument, Ortiz-de-Mandojana et al. (2012) find that director interlocks with firms providing green equipment and business knowledge-intensive services are positively linked with the possibility to adopt a proactive environmental strategy; while director interlocks with suppliers of financial resources and fossil fuels tend to discourage adoption of a proactive environmental strategy. Furthermore, Ortiz-de-Mandojana et al. call for a more in-depth analysis of the influences of board characteristics (e.g., board size, professional and educational backgrounds of individual directors) on a firm's sustainable strategy.

To sum up, research suggests that boards of directors can play an important role in leading CSR strategy. The ability of a company's boards to foresee the impact of climate change/social responsibility on its business reflects its ability to understand its business activities in the light of longer-term and systematic risks. Firms that are able to make short-term decisions in the light of such a longer-term view are much more likely to be cognisant of the systematic risks that they face, and can be better prepared to face the challenges and unforeseen circumstances such as the financial crisis (Greenwald, 2009). There are some limitations of these prior studies. First, CSR strategy is not directly measured (Ho, 2005; Mackenzie, 2007). Even if it is measured, only one variable is used (e.g., Ortiz-de-Mandojana et al., 2012). Furthermore, prior research is constrained by cross-sectional study (Galbreath, 2010). In chapter 6, CSR strategy is directly measured by using a composite score of a number of relevant CSR variables. Furthermore, I conduct a longitudinal study to examine the influences of various board attributes on a firm's multi-pronged CSR

strategies. Moreover, the sample covers a wide array of industries across several years making the analysis more representative of industries.

3.3.3 CSR strategy and firms' environmental and social performance

In an attempt to explain the positive association between measures of a firm's environmental performance and financial performance, some studies drawing upon the notion of CSR as a competitive strategy (cf: Porter and Kramer, 2006; Porter and Van der Linde, 1995) and adopting the resource based view of the firm (Hart, 1995; Russo and Fouts, 1997) have posited that it is the superior environmental strategy and the unobserved managerial capability, unique resources and competitive advantage that a firm possesses which can enable it to achieve superior environmental and financial performance.

Hart (1995) theorized that proactive investments in environmental strategies including pollution prevention and product stewardship could confer both environmental and economic benefits to firms, and emphasized the importance of communicating these environmental strategies to external stakeholders. Hart also states that for firms to sustain their competitive advantages in the field of environment, it is important to consistently build upon their internal human and organisational capabilities and resources, as these may otherwise erode over time as competitors catch up.

Russo and Fouts (1997) empirically tested the predictions of RBV, and found a positive link between environmental performance and firm operating profitability. They assumed this link to be mediated by the unobserved superior environmental strategy which they conjectured to be based on unique combinations of intangible (such as human, reputation, technology), and tangible (such as financial reserves and physical equipment) assets. Russo and Fouts also stress the importance of nurturing and building resources through sustained actions for creating and maintaining a pro-environmental internal capabilities and external reputation.

Al-Tuwaijri et al. (2004) argue that the reason for the positive link between a firm's environmental and financial market performance is the unobservable managerial quality. In other words, they imply that better managers are able to design superior environmental strategies, which in turn lead to superior environmental performance and disclosures. Clarkson et al. (2011) also argue

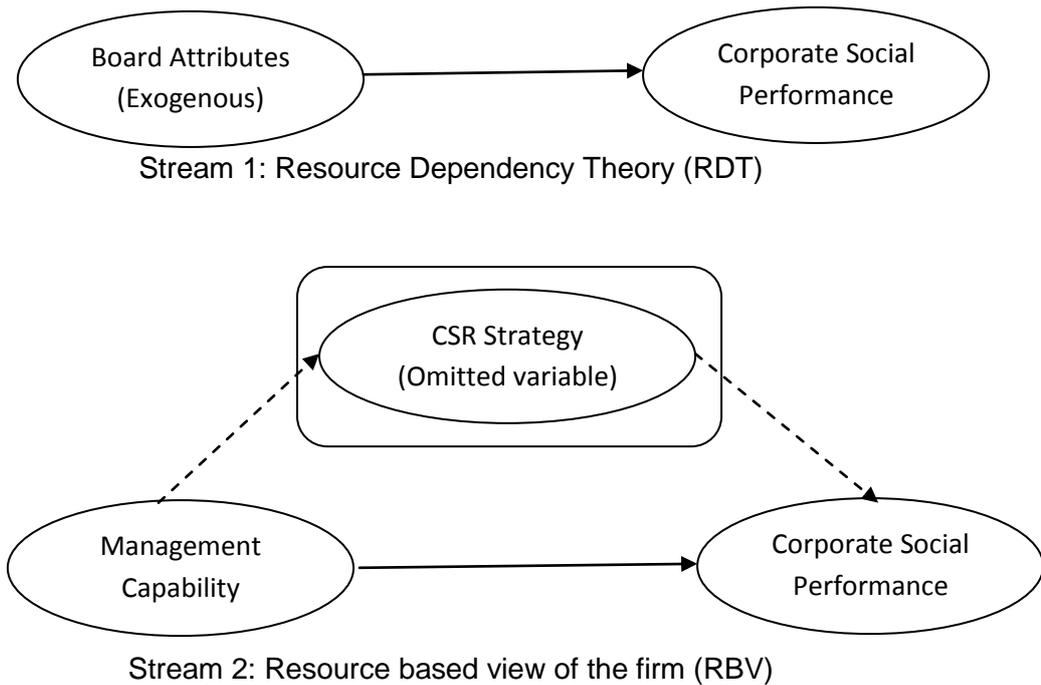
that it is the superior managerial capability that can allow a firm to develop a proactive environmental strategy. They measure a firm's proactive environmental strategy and its superior managerial capability by the firm's investments in R&D, its sales growth and its enterprise value to assets (EV). So measured, they find a positive link between a firm's proactive managerial environmental strategy and its environmental and economic performance.

While both Al-Tuwaijri et al. (2004) and Clarkson et al. (2011) posit the environmental strategy to be responsible for superior environmental performance, neither study explicitly incorporates relevant CSR related board attributes. Furthermore, one important limitation of these studies is that they either assume the (unobserved) superior CSR strategy to drive CSR performance (as in the case of Al-Tuwaijri et al., 2004) or use indirect measures to capture a firm's strategic stance towards its CSR obligations. Given that developing the appropriate corporate strategy including CSR strategy is a function of the board (UK Code of Corporate Governance, 2010), both board attributes and CSR strategy may affect a firm's environmental and social performance.

3.3.4 Within-equilibrium or out-of-equilibrium phenomenon

Figure 3.1 provides a brief summary of existing literature and the omissions in this literature about the link among board attributes, CSR strategy and corporate social performance.

Figure 3.1: Existing Literature (Two Main Streams)



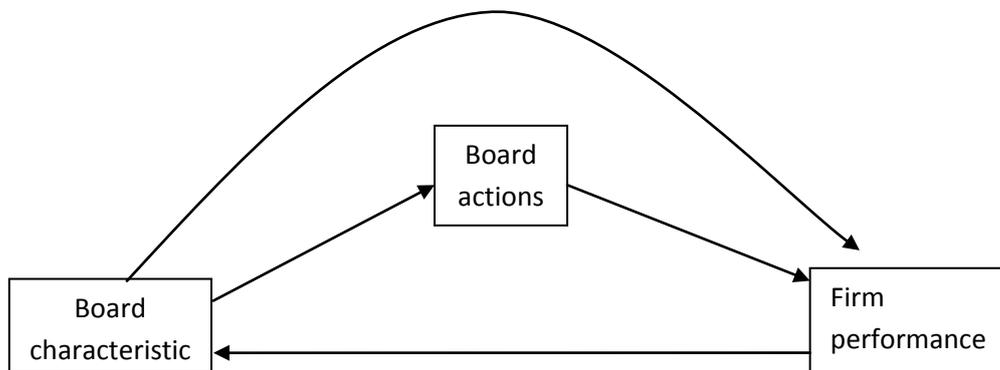
It can be seen from Figure 3.1 that one stream drawing upon the corporate governance literature, particularly the resource dependency theory (RDT), has focused on studying the relation between board structure and composition, and corporate social performance (section 3.3.1). Of interest in this literature has been the link between various board attributes particularly director attributes and corporate social performance (e.g., Johnson and Greening, 1999; Galbreath, 2010 and Mallin and Michelon, 2011; Webb, 2004). However, as mentioned earlier the underlying assumption in these studies is that board attributes are exogenous. Also while some studies in this literature (covered in section 3.3.2) consider the role of the board in CSR strategy setting, the latter variable is not well defined (e.g., Mackenzie, 2007) nor is the link between board attributes and CSR strategy directly analysed.

Another stream drawing upon the competitive strategy literature and adopting the resource-based view (RBV) of the firm (Hart, 1995; Rousso and Fouts, 1997), suggests that firms possessing unique (CSR conducive) resources, both human and financial capital are able to develop superior CSR strategies that translate into superior, CSR-related performance. However, CSR strategy is considered as an omitted/unobserved variable in this literature (e.g., Al-Tuwaijri et al., 2004; Clarkson et al., 2011). Also while this literature acknowledges the role of management capability in determining firm CSR strategy (e.g., Al-

Tuwaijri et al., 2004 and Clarkson et al., 2011), it ignores the fact that developing and implementing the appropriate CSR vision and strategy of firms is the function of corporate board (Ho, 2005; Mackenzie, 2007).

It is widely acknowledged within the corporate governance literature (e.g., Adams et al., 2010; Agrawal and Knoeber, 1996; Hermalin and Weisbach, 1998, 2003) that board of director characteristics and firm performance are endogenous outcomes. According to Hermalin and Weisbach (2003), the board of directors of a company is an endogenously determined institution, which implies that the choice of directors on a board would be a within-equilibrium phenomenon determined by the company's own characteristics including its (CSR related) strategies and financial/non-financial performance (such as CSR performance). Figure 3.2 shows Hermalin and Weisbach (2003) theoretical model establishing the link between board of directors and firm performance.

Figure 3.2 Hermalin and Weisbach (2003) theoretical model with respect to boards of directors: The joint-endogeneity problem plaguing work on boards of directors



Source: Hermalin and Weisbach (2003)

As a within-equilibrium phenomenon, CSR performance may also affect board choices. Furthermore, Hillman et al. (2007) find that the presence of women on boards is consistent with resource dependence theory. They posit that large firms face legitimacy pressures, firms operating in industries that are heavily dependent on female employees, and firms with ties to companies with female board members are likely to have women directors on their board. Hence, they argue the composition of boards could mirror the environmental constraints faced by firms, and propose that firms can strategically select board members as a means to reduce uncertainty. Therefore, it can be argued that CSR performance may affect board attributes. Prior studies examining the link

between board characteristics and CSR performance treating board attributes as exogenous may lead to misleading interpretation of findings. In Chapter 6, I adapt Hermalin and Weisbach (2003) theoretical model in the context of CSR study and test the links between board attributes, board CSR strategies and a firm's environmental and social performance using structural equation modelling, which allows to control for the possible endogeneity of these links.

3.4 Conclusions

In this chapter, prior literature about environmental and social responsibility is reviewed. First, research about the link between environmental and social responsibility and firms' financial performance is discussed. Although prior studies provide mixed results regarding this link, it is important to distinguish ESP and ESD. In Chapter 4 and 5, I will investigate the link between ESD and firms' financial performance (both operating profitability and market performance). Furthermore, In Chapter 5, I will test the association between ESD and ESP.

I also review in this chapter existing literature about the relation between environmental and social responsibility (including related strategy and performance) and corporate governance. In Chapter 6, I will examine the relationship between corporate governance (in particular board attributes and related CSR strategy) and ESP. In the next i.e., the first empirical chapter, the link between environmental and social disclosures and firm profitability will be examined.

Chapter 4: Environmental and social disclosures and firm profitability

4.1 Introduction

Environmental and social disclosures are a means through which a firm informs its stakeholders, particularly its investors, as to how it has addressed its environmental and social responsibility. Given the voluntary nature of these disclosures, research scholars approaching from the accounting and economics perspective have taken a keen interest in exploring the determinants and the consequences of such disclosures. From an economics perspective, producing high quality objective disclosures entail costs (Brammer and Pavelin, 2008; Buhr, 2002; Li and McConomy, 1999). However, in line with the predictions of the voluntary disclosure theory (Verrecchia, 1983), recent research shows that they also entail benefits particularly in the form of reducing the information asymmetry between the firm and its investors (Cormier et al., 2011). To date however, research has failed to establish a clear link between a firm's environmental and social disclosures and its profitability and market value (will be examined in the next chapter) – a gap that this study attempts to fill.

Exploring the determinants of a firm's environmental disclosures, a number of studies have examined the link between a firm's environmental disclosures and its financial performance including profitability (Brammer and Pavelin, 2006, 2008; Clarkson et al., 2008; Cormier et al., 2011; Freedman and Jaggi, 1988; Patten, 1991). However, all find no link between environmental disclosures and various measures of a firm's profitability. Discussing the limitations of their own work, and that of others, Brammer and Pavelin (2008) suggest that future work should use longitudinal data and try to resolve causality concerns. However, given the cross sectional nature of most prior studies, it has only been possible to establish correlation, but not causation. Recent studies have also either assumed the endogeneity of this link, especially with respect to measures of market performance of a firm and its environmental performance (e.g., Al-Tuwaijri et al., 2004 and Clarkson et al., 2011), or even where explicitly tested (again with respect to market measure of performance), causation has not been established (see Nelling and Webb, 2009). One exception is the work of Clarkson et al. (2011) who do find evidence that improvements in financial resources precede improvements in environmental performance. However, to

the best of my knowledge, no prior study investigates the causality between profitability and ESD. In this chapter, I will address both issues. Using longitudinal data (2005-2009), first I establish the contemporaneous association between environmental and social disclosures and firm profitability, and then drawing upon Nelling and Webb's (2009) application of Granger causality test I address the issue of causality between these variables.

Accordingly, two research questions are explored in this chapter: (1) does firms' operating performance affect their environmental and/or social disclosure? This question is addressed while controlling for other factors that might affect firms' environmental and/or social disclosure. (2) If profitability is associated with higher and more comprehensive disclosures, which way does the causality run?

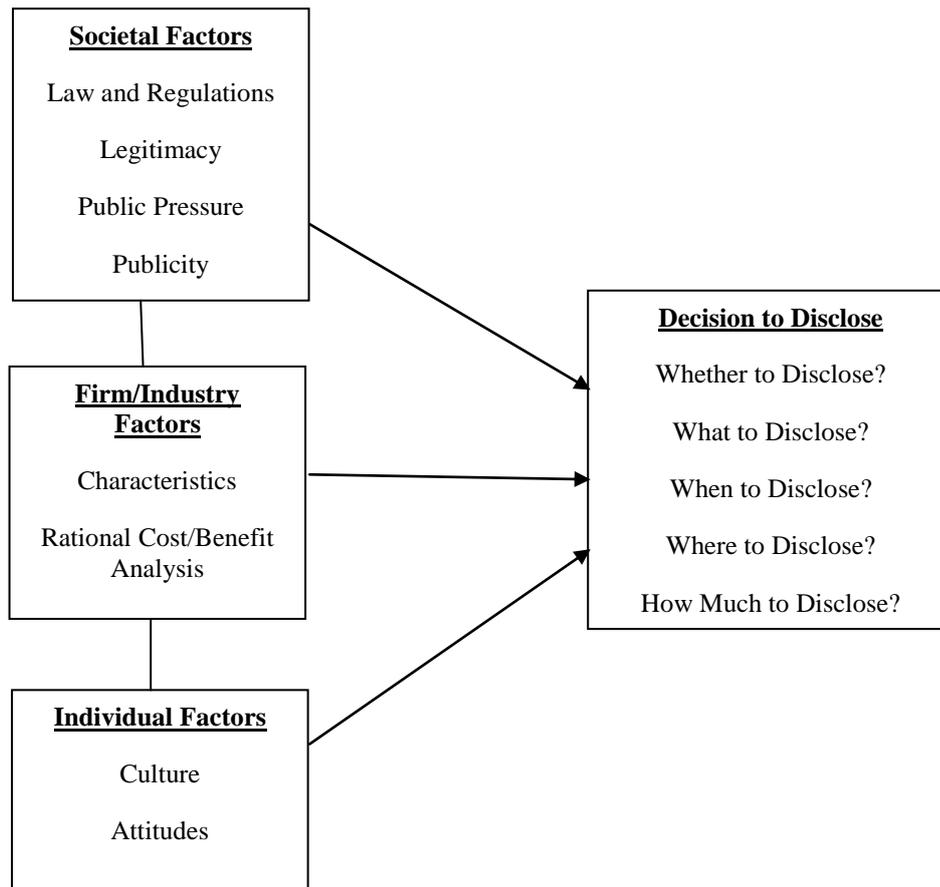
This study makes a number of contributions to the prior literature on environmental and social disclosures and a firm's financial performance. First, it uses a new, longitudinal data set, namely Bloomberg environmental and social disclosure scores, which provides a comprehensive measure of a firm's environmental and social disclosures. These scores unlike the limited environmental measures used by some prior studies (e.g., Hart and Ahuja, 1996, using emission reduction and Al-Tuwaijri et al., 2004, using specific pollution measures) use a large array of ESG-related factors to develop a firm's E, S, and G score. Next, using this data set, it tests and finds a clear positive link between different measures of a firm's profitability and its environmental and social disclosures. Furthermore, given the longitudinal nature of the dataset, it is possible to directly test for causality between environment (E) and social (S) scores and firm operating profitability. The causality test suggests that the link runs from profitability to ES and S disclosures. In addition, given that the dataset covers a wide cross section of industries, the results are not limited in terms of applicability to specific industries (e.g., Clarkson et al., 2011) or only to firms meeting certain financial value-relevant criteria (e.g., Al-Tuwaijri et al., 2004).

4.2 Hypothesis development

According to Lee and Hutchison (2005), there are three main types of factors that affect CSR disclosure: firm or industry factors (e.g., firm size, industry and financial ratios), societal factors (e.g., media exposure and stakeholder groups)

and individual factors (e.g., governance, attitudes and controls). Figure 4.1 displays the factors affecting the decision to disclose environmental or social information. In this study, I use various firm/industry factors and societal factors (as used in prior literature) in determining the decision to disclosure environmental and social information.

Figure 4.1: Factors affecting the decision to disclose environmental or social information



Adapted from Lee and Hutchison (2005)

Based on prior literature, I explain the predicted sign with respect to each variable that may affect firms' environmental and/or social disclosures in the following paragraphs⁷.

⁷ Based on Lee and Hutchison's disclosure framework and Brammer and Pavelin's (2008) study, it is interesting to explore further other factors that may have an effect on a firm's ESD such as firm size and media exposure. Hence, I develop hypotheses with respect to the control variables rather than simply include them as addition controls in the empirical models.

4.2.1 Profitability, slack recourses and ESD

Empirical evidence suggests that there has been a significant change in social disclosure behaviour of UK listed firms, with a trend towards improvement in the quality of disclosures (Gray et al., 1995). Despite the improvements in the quantity and quality of environmental and social disclosures, relatively little research has examined the link between corporate social/environmental disclosures and firm financial performance, particularly profitability. Pointing to the paucity of research on this link, Lee and Hutchison (2005) comment that the role of profitability in environmental disclosures is incompletely explained.

From an accounting and economics perspective, production and distribution of voluntary environmental and social information entails costs, even if it is likely to confer benefits (Verrecchia, 1983). For example, Brammer and Pavelin (2008) suggest that there are two types of costs involved in making disclosures: *“the costs of measuring, verifying, collating and publishing environmental information, and the loss of strategic discretion associated with making public commitments to verifiable future actions and/or performance”* (p.122).

Yet, Prior studies find no link between profitability and environmental disclosures (Brammer and Pavelin, 2006, 2008; Cormier et al., 2011; Freedman and Jaggi, 1988; Patten, 1991). One possible reason for the failure of prior research to clarify this link could be the cross sectional nature of prior studies, but more importantly, the largely limited and qualitative nature of the information used to measure disclosure in prior work. Hence, while Freedman and Jaggi (1988) use disclosures related only to pollution control, Patten (1991) uses number of pages in the annual reports devoted to such disclosures. Even more recent work by Brammer and Pavelin (2008) uses five measures of disclosures, all dummy variables, based on a firm's policy stance towards its environmental responsibility. Hence, one can argue that the failure of prior research to reveal any meaningful link between environmental and/or social disclosures and firm profitability could be the limited and largely qualitative nature of the disclosures used. In this study, I use comprehensive and objective measures of environmental and social disclosures based on what Clarkson et al. (2008) consider 'hard' quantitative data that would be difficult for poor environmental

performers to mimic. I then analyse the link between the environmental and social disclosures of a firm and its profitability.

Moreover, the slack resource theory (Penrose, 1956), suggests that the existence of surplus financial resources or “company slack” should play an important role in corporate strategic decision making. There is research which shows that the availability of resources influence the production and timing of disclosures. For instance, Li and McConomy (1999) find that the disclosure of provisions related to removal and site restoration costs by mining and oil and gas companies was related to the financial health of the companies. Buhr (2002) investigates the initiation of environmental reports by two Canadian pulp and paper firms, and notes that profitability was an issue in the timing of the production of the report by one firm, given that its production was an expense.

Hence, while related empirical evidence suggests that profitability and availability of resources should matter for making higher and ‘hard’ environmental (and social) disclosures, direct evidence testing this link fails to identify this relation. In this study, I revisit this link using various measures of profitability and environmental and social disclosure scores from Bloomberg.

Thus drawing upon the costs and benefits analysis (Verrecchia, 1983) and slack resources theory (Penrose, 1959; Bourgeois, 1981), it can be predicted that more profitable firms and/or those with more financial slack resources, would tend to have higher environmental and/or social disclosure scores. Accordingly, I hypothesise that,

H1: Firms with higher operating profitability/slack tend to have higher environmental and/or social disclosure scores.

It is important to note that in the above hypothesis the causality is assumed to run from profitability to environmental and social disclosures. Given the cross sectional nature of prior studies (e.g., Brammer and Pavelin, 2008), to date it has only been possible to establish correlation, but not causation. In this study, drawing upon Nelling and Webb’s (2009) application of Granger causality, it explicitly tests the causality between the sample firms’ profitability and the level of their environmental and social disclosures.

4.2.2 Firm size and ESD

Hillman and Keim (2001) posit that size matters because it may be related to the urgency and salience of stakeholder relations. Size captures various factors motivating firms to issue environmental and social reports such as public pressure or financial resources (Lang and Lundholm, 1993). Prior studies find a strong positive relation between firm size and environmental and social disclosure/performance (Brammer and Pavelin, 2008; Cormier et al., 2011; Dhaliwal et al., 2011). Based on the economics based disclosure theory, Clarkson et al. (2008) state that most voluntary disclosure studies control for firm size as larger firms would have economies of scale with respect to information production costs. In other words, it is cheaper for larger firms to provide more disclosure/information. From another perspective, the so called socio-political theory, larger firms tend to be more visible to public and face greater pressure from a variety of external stakeholders (Patten, 2002b; Deegan, 2002), thus larger firms may be driven to make more environmental and/or social disclosure to legitimize their activities (Brammer and Pavelin, 2006). From both perspectives a positive relation between size and disclosure is expected. Thus the hypothesis is,

H2: Bigger firms tend to have higher environmental and/or social disclosure score.

4.2.3 Firm leverage and ESD

From an economics perspective, producing high quality objective disclosures entail costs (Brammer and Pavelin, 2008; Buhr, 2002; Li and McConomy, 1999). Brammer and Pavelin (2006) find a negative relationship between environmental disclosure and leverage. They argue that firms with higher level of leverage may face more pressure from creditor(s) and it could be more difficult to raise funds to invest in environmental activities and disclosure. So firm would have less ability to invest in environmental and social activities and hence would make lower environmental and social disclosures. In other words, debt holders as monitors are also concerned about firm's ability to repay its debt. More the funds invested in environmental and social activities and disclosures, less of the firm's profit will be devoted to repay interest and debt to creditors. Therefore, a negative relation is predicted between a firm's leverage and its ESD.

H3: Firms with higher leverage tend to have lower environmental and/or social disclosure score.

4.2.4 Financial activities and ESD

It is argued that less (internally) profitable firms in terms of having the need to raise external finance will spend less money on environmental and social activities, and hence will make less ESD. Ioannou and Serafeim (2012) use debt issuance and equity issuance separately over total assets to measure firms' financing and find a strong negative relationship between equity and/or debt issuance and environmental and social score respectively. Conversely, one can also argue that firms raising financing in debt and equity markets have a higher propensity for voluntary disclosure to lower their cost of capital (Clarkson et al., 2008, Dhaliwal et al., 2011). Clarkson et al. (2008) use the ratio of total amount of debt and/or equity financing raised in fiscal year 2004 to total assets at the end of fiscal year 2002 to measure firms' capital financing. They find a weak positive relationship between hard environmental disclosure (i.e., criteria that are difficult for poor performers to mimic such as carbon emission and water usage) and financial activities, and a strong positive relationship between soft environmental disclosure (such as policy statement and environmental initiatives) and financial activities in the inter-industry analysis. Given the mixed prior evidence, no directional predictions are made between environmental and/or social disclosure and financial activities. Hence, it is hypothesised (in null form),

H4: Firms' financial activities (in terms of raising capital by issuing equity and/or debt) are not correlated with their environmental and/or social disclosure score.

4.2.5 Ownership structure and ESD

Ownership structure can affect the level of monitoring and the extent of voluntary environmental and social disclosures. Based on principle-agent model, when ownership is dispersed, shareholders, having little by way of direct authority over managers, must monitor their activities. In the absence of an ability to effectively monitor management, the consequent degree of information asymmetry between the organisation and its shareholders may bring an adverse investor reaction. Hence, one would expect a diffused ownership

structure to carry with it an incentive for a firm to voluntarily provide information to shareholders through disclosures (Brammer and Pavelin, 2008). Furthermore, firms with dispersed ownership are expected to be responsive to public investors' information costs (assume that shareholders want relevant ESD), because no dominant shareholders typically have access to the information they need (Cormier et al., 2011). In other words, the higher the percentage of strategic shareholdings, the lower the dispersion of shares and lower the information asymmetry between strategic shareholders and the firm. Hence, lower the companies' ESD will be. Therefore, a negative relation is expected between ESD and strategic shareholdings.

H5: Firms with higher strategic shareholdings tend to have lower environmental and/or social disclosure score.

4.2.6 Industry specific and fixed year effects

Most existing research suggests consideration of environmental sensitivity issue across industries (Ingram and Frazier, 1980; Wiseman, 1982; Al-Tuwaijri et al., 2004; Brammer and Pavelin, 2008; Clarkson et al., 2008; Hershcovis et al., 2009). It is argued that industries play an important role in determining firms' ESD. Brammer and Pavelin (2006) find that industries with a higher environmental impact tend to make more environmental disclosures. A number of prior studies associate the following industries – Chemical, Energy, Oil and Gas, Mining and Utilities with high environmental impact (Clarkson et al., 2008; Brammer and Pavelin, 2008), and attempt to control for fixed industry effect by using industry dummies (i.e., score one for those industries with high environmental impact). Brammer and Pavelin (2008) find that firms in Chemicals and Utilities tend to disclose more environmental information, while financial companies are not willing to disclose their environmental information. In this study, industry dummies are also used to control for fixed industry effect in all regression models. Time fixed effect is also controlled for by creating year dummies for each year.

Societal Factors

4.2.7 Media exposure and ESD

Based on the legitimacy perspective, a positive relationship is expected between media exposure and environmental and social disclosures. In other

words, higher levels of media exposure increase public concerns (i.e., companies face more public pressure). Thus firms choose to react through more environmental or social disclosure to change investors' perception.

A number of studies use media exposure as a control variable and find similar results, although the measurements of media exposure are slightly different. Cormier et al. (2011) find a strong positive relationship between environmental news exposure and environmental disclosure, as well as a strong positive relationship between environmental news exposure and social disclosure. In their paper, the environmental news content is obtained from the ABI/Inform Global database based on three different sources – business publications, journals and Canadian newsstand. Brammer and Pavelin (2006) use Factiva database to measure the incidence of news covered by media and find a positive relationship without controlling for industry effect. Similarly, Clarkson et al. (2008) adopt Janis-Fadner coefficient to measure media coverage and extract data from Factiva database in year 2002, and only find a positive relationship between soft environmental disclosure and J-F coefficient in the intra-industry OLS analysis. Hence, it can be hypothesised that,

H6: Firms with more media exposure tend to have higher environmental and/or social disclosure score.

4.3 Models, methodology and variables

4.3.1 Models tested

The following model is developed to test above-mentioned hypotheses (H1-H6).

$$ES/E/S \text{ Score}_{i,t} = \beta_0 + \beta_1 \text{Profitability}_{i,t} + \beta_2 \text{Slack}_{i,t} + \beta_3 \text{Size}_{i,t} + \beta_4 \text{Leverage}_{i,t} + \beta_5 \text{Financial activities}_{i,t} + \beta_6 \text{Strategic holdings}_{i,t} + \beta_7 \text{Media exposure}_{i,t} + [\text{Industry Dummies}] + [\text{Year Dummies}] + \varepsilon_{i,t} \quad (4-1)$$

In the above model, the dependent variable is the environmental and social disclosure score (and its components) as developed by Bloomberg. Return on sales (ROS) and return on equity (ROE) are used as the measures of firm profitability in this study. The availability of financial slack is another important explanatory variable. As already discussed above, based on related literature, a wide array of control variables are used including: firm size, leverage, financial activities, strategic shareholdings, media exposure, industry and year fixed effects.

To test for causality between a firm's operating profitability and its ES/E/S disclosure score, Granger causality test is conducted following Nelling and Webb's (2009) approach⁸. The models tested are as follows:

$$ES/E/S \text{ Score}_{i,t} = \beta_0 + \beta_1 ES/E/S \text{ Score}_{i,t-1} + \beta_2 Profitability_{i,t} + \beta_3 Profitability_{i,t-1} + \beta_4 Slack_{i,t} + \beta_5 Size_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 Financial \text{ activities}_{i,t} + \beta_8 Strategic \text{ holdings}_{i,t} + \beta_9 Media \text{ exposure}_{i,t} + [Industry \text{ Dummies}] + [Year \text{ Dummies}] + \varepsilon_{i,t} \quad (4-2)$$

$$Profitability_{i,t} = \beta_0 + \beta_1 Profitability_{i,t-1} + \beta_2 ES/E/S \text{ Score}_{i,t} + \beta_3 ES/E/S \text{ Score}_{i,t-1} + \beta_4 Slack_{i,t} + \beta_5 Size_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 Financial \text{ activities}_{i,t} + \beta_8 Strategic \text{ holdings}_{i,t} + \beta_9 Media \text{ exposure}_{i,t} + [Industry \text{ Dummies}] + [Year \text{ Dummies}] + \varepsilon_{i,t} \quad (4-3)$$

In equation (4-2), ES/E/S score is a function of lagged ES/E/S score, current profitability and lagged profitability, while in equation (4-3), profitability is a function of lagged profitability, and current and lagged ES/E/S score. All variables are defined in the same way as in equation (4-1). If the coefficients β_2 and β_3 of profitability are significant in equation (4-2), then it can be concluded that firms' profitability 'Granger causes' ES/E/S score. Similarly, if the coefficients β_2 and β_3 in equation (4-3) are significant, it can be said that firms' ES/E/S score 'Granger causes' profitability. The coefficients only represent the sign of the relation not the magnitude (Nelling and Webb, 2009). Both operating profitability measures are tested in the Granger causality analyses, but only the results with respect to ROS are reported, as this is the measure found to be significant.

When estimating econometric models using pooled sample, it is important to control for model residuals. It is likely that the residuals for each firm may be correlated across years, as well as correlated across firms within a single year. Therefore, both industry and year dummies are controlled for. Furthermore, to avoid serial correlation, the standard errors are clustered by individual firm identity. In line with appropriate methodology for limited dependent variables, Tobit regressions are used whenever ES/E/S is the dependent variable i.e., in Equation (4-1) and Equation (4-2); and OLS regression is used in Equation (4-3).

⁸ A dynamic model has been considered as an alternative method. However, based on the suggestions from prior studies (e.g., Nelling and Webb, 2009), Granger causality test has been widely used. Furthermore, by including both current and lagged variables, it is possible to examine the direction of causality with respect to both variables.

4.3.2 Measurement of variables

The measurement of each variable is explained as follows:

ES/E/S: ES is the sum of environmental and social disclosure score for each firm for every year. E (S) score refers to the environmental (social) disclosure score.

Profitability: measured by ROS and ROE which are widely used in related literature (Freedman and Jaggi, 1988, 1992). ROS is the ratio of earnings before interest and taxes (18191) to net sales (01001). ROE denotes the ratio of net income before preferred dividends minus preferred dividend requirement to last year's common equity.

Slack: slack resource is defined as the natural logarithm of the sum of cash & short-term investments (02001) and total receivables (02051) (Arora and Dharwadkar, 2011).

Size: firm size is measured by the natural logarithm of employee number (07011) (Hershcovis et al., 2009; Padgett and Galan, 2010; Arora and Dharwadkar, 2011). As suggested by Arora and Dharwadkar (2011), most previous research measures size according to total sales and total assets, they prefer to use number of employees as size measure. They state other variables like ROA or R&D intensity involves total assets or sales in the denominator, a size measure based on assets or sales could cause multicollinearity problems. Thus they suggest that use of the number of employees avoids this problem without loss of information. Furthermore, different size measures such as natural logarithm of total assets and net sales have been used to test above hypotheses. Consistent with Arora and Dharwadkar's (2011) argument, the results indicate that there is potential multicollinearity problem with respect to some independent variables when using either size measure. For example, the correlation between size (log of employee number) and media is 0.48, while the correlations is 0.68 by using log of total assets or 0.67 by using log of sales. Similarly, the correlations between firm size and slack are 0.65 (firm size is measured as log of employee number), 0.87 (measured as log of sales) and 0.89 (measured as log of total assets) respectively. The correlations indicate that natural logarithm of employee number is more suitable as size measure in this study, compared to the other two measures which are highly correlated with

other independent variables. Hence, natural logarithm of employee number is used as firm size measure in this study.

Leverage: total debt (03255) divided by total assets (02999).

Financial activities: this variable is captured by the ratio of net proceeds from sale/issue of common and/or preferred stock (04251) during the year to total assets (02999) at the beginning of the year.

Strategic shareholdings (NOSHST): it is measured as the percentage of total shares in issue held strategically and not available to ordinary shareholders. Holdings of 5% or more are counted as strategic.

Media exposure: it represents a firm's media sensitivity to environmental issues, which is measured as the number of news exposed by Nexis@UK⁹ that provides searchable archives of news content from global sources. The number of environmental news is obtained by searching a firm's name and any one of the following terms "environment sustainability", "waste management", "pollution" and "environmental award" (as used by Cormier et al., 2011) within all English language news published over the world. One year period is specified to be 1 January 200X to 31 December 200X. Furthermore, moderate similarity of duplicate options¹⁰ is allowed. Since there is big variation of news exposed, the media exposure variable is transformed by taking natural logarithm. However, there are many firms with zero piece of news. I add one to the number of news exposed for each firm before taking the logarithm. One limitation of this measure is that the number of news exposed varies slightly across time. To brief the explanation, media exposure denotes the number of news exposed by Nexis@UK¹¹.

⁹ This database gives access to both news and company information. News coverage contained in this database comes from national and local newspapers, press releases, transcripts of TV broadcasts, newswires, statistical bulletins, magazines and trade journals. Company option provides access to financial reports and company profiles from around the World.

¹⁰ Duplicate options let you choose whether or not you want to use similarity analysis to process your search results. Similarity analysis analyses a results list, identifies documents that have similar content, and groups the similar documents together. Moderate similarity means documents with relatively less similarity can be included in the same group of similar documents. (LexisNexis@help)

¹¹ The variables used to capture media exposure are derived from Cormier et al.'s (2011) measurement. However, it can be argued that a more complicated measurement can be used. For example, the Factiva database can be used to measure the incidence of news covered by media (e.g., Brammer and Pavelin, 2008). When I collect the data for media exposure variable, the Factiva database cannot be accessed. Hence, I use some variables (as also used by Cormier et al. 2011) to capture media exposure and manually collect firms' environmental news from Nexis@UK database.

Industry (ICBIC) and year dummies: based on FTSE/DJ Industry Classification Benchmark (ICB) 2008 industry classification, firms are grouped in one of the following industries: Oil&Gas (0001), Basic materials (1000), Industrials (2000), Consumer goods (3000), Health care (4000), Consumer services (5000), Telecommunications (6000), Utilities (7000) and Technology (9000). Financials (8000) are not included in this study. The industry (year) dummy variables take a value of one if a firm operates in that sector (year); zero otherwise.

4.4 Sample and data

The sample is a pooled cross-section and time series data over five years (2005-2009), and consists of FTSE350 companies excluding financial institutions¹² which need to follow different environmental and social related regulations like the 'Equator Principles' (see Macve and Chen (2010) about bank voluntary disclosure, i.e. environmental and social issues in project financing). By absolute number, there are 327 out of the FTSE all share constituents that provide some sort of ESG data. However, firms without full ESG data are dropped out in this study. Hence, based on the availability of full ESG data, the final sample consists of 152, 214, 165, 87 and 11 for the year 2009, 2008, 2007, 2006 and 2005 respectively. In total, there are 629 firm-year observations. Every effort has been made to collect all firms with ESG data available over the five years.

Industries are classified by using FTSE/DJ single-digit Industry Classification Benchmark (ICB) March 2008 version. This leads to 9 single-digit industry classifications in the sample: Oil & Gas, Basic Materials, Industrials, Consumer Goods, Health Care, Consumer Services, Telecommunications, Utilities and Technology. Table 4.1 gives the break-down of industries covered in the sample over the five-year period. As Table 4.1 shows general industrials and consumer services account for the bulk of companies in the sample. Within industrials fall mostly heavy manufacturing industries like construction and building materials, defence and aerospace, and other industrial engineering industries like electrical components and equipment and electronic equipment. Consumer services include food and drug retailers, general retailers, media, and travel and

¹² I have analysed a few sustainability reports of some financial companies such as HSBC and Barclays, and found their disclosure formats and content are dramatically different from other non-financial companies. Moreover, some financial companies (especially smaller ones) do not provide relevant information about their ESD or control variables. Thus, financial companies are excluded for this study.

leisure industries. In short, the sample represents a wide range of industries over five years.

Table 4.1 Number of sample companies in each sector by year

Industry Code	Industry	2005	2006	2007	2008	2009	Total
0001	Oil & Gas	2	9	11	16	12	50
1000	Basic Materials	2	9	11	17	14	53
2000	Industrials	2	27	52	65	37	183
3000	Consumer Goods	2	9	19	25	20	75
4000	Health Care	0	3	5	5	5	18
5000	Consumer Services	3	17	47	59	43	169
6000	Telecommunications	0	3	4	5	3	15
7000	Utilities	0	4	8	10	6	28
9000	Technology	0	6	8	12	12	38
	Total	11	87	165	214	152	629

The disclosure data is obtained from Bloomberg. Bloomberg assigns environmental, social and governance disclosure scores to firms based on data points (100 different data points including 60 environment, 26 social and 14 governance related data points) collected by analysts via multiple sources including annual reports, standalone sustainability reports and company websites. The disclosure data is available from 2005 (generally goes back to 2007, sometimes 2006 and occasionally 2005). Within each E, S and G category, the score of individual firm is then expressed in percentage, so as to make data comparable across firms and sectors. The score is also tailored to be industry specific, so that each firm is evaluated only in terms of the data that is relevant to its industry sector. E.g., gas flared is only used to score firms in oil and gas industry. A data point like phones recycled is only used to score firms in the telecommunication industry. Furthermore, the data points are also weighted in terms of importance by ESG practitioners. For example, Green House Gas emissions or number of independent directors would be weighted more heavily than other data points. Hence, the scores not only capture the quantity but the quality of environmental, social and governance disclosures. See Appendix 2 for full detail of the data points collected under each E, S, and G category. All Accounting data is collected from Worldscope and financial data is from Datastream. Environmental news data is obtained from Nexis@UK.

4.5 Results

4.5.1 Descriptive and correlation statistics

Table 4.2 provides the descriptive statistics for all variables used in the analyses, while Table 4.3 provides the correlations between these variables.

Table 4.2 Descriptive statistics

Variable	Observation	Median	Mean	S.D.	Min	Max
ES	617	49.00	54.38	23.85	11.10	124.39
E	619	19.51	22.02	13.53	2.33	63.57
S	627	28.07	32.10	12.87	4.69	70.18
ES _{t-1}	380	51.12	55.91	24.33	11.90	124.39
E _{t-1}	381	20.93	22.72	13.76	2.33	62.79
S _{t-1}	388	28.07	32.84	13.16	4.69	70.18
Slack	607	6.07	6.20	1.53	2.21	11.11
ROS	622	0.12	0.15	0.27	-1.28	5.42
ROE	600	0.17	0.24	0.46	-1.10	5.02
ROS _{t-1}	620	0.13	0.16	0.28	-1.93	5.42
ROE _{t-1}	605	0.19	0.26	0.43	-2.41	4.71
Size_emp	622	9.34	9.29	1.62	2.56	13.30
Leverage	627	0.23	0.25	0.19	0	1.33
Fin_acts	627	0.002	0.02	0.07	-0.01	0.85
Str_holds	629	0.16	0.20	0.17	0	0.83
Media	629	1.39	1.61	1.53	0	6.53

Notes: ES denotes the sum of environmental and social disclosure scores; E denotes environmental disclosure; S denotes social disclosure; ES_{t-1}, E_{t-1} and S_{t-1} refer to one year lagged ES, E and S score respectively; Slack is measured as the natural logarithm of the sum of cash & short term investment and total receivables; ROS denotes the ratio of earnings before interest and taxes to net sales; ROE denotes the ratio of net income before preferred dividends minus preferred dividend requirement to last year's common equity; ROS_{t-1} and ROE_{t-1} refer to one year lagged ROS and ROE; Size_emp denotes firm size and is measured as the natural logarithm of employee number; Leverage is defined as the ratio of total debt to total assets; Fin_acts is defined as financial activities and measured as the ratio of net proceeds from sale/issue of common and/or preferred stock during the year to total assets at the beginning of the year; Str_holds refers to strategic shareholdings and is measured as the percentage of total shares in issue held strategically and not available to ordinary shareholders (holdings of 5% or more are counted as strategic); Media denotes media exposure and is measured as the natural logarithm of the number of environmental news exposed by media plus one.

Table 4.2 shows that the mean value of ES, i.e., the summed E and S scores, is 54% (about 56% for lagged ES score). The summed ES score is the simple summation of the individual E and S scores of the firms, and could be interpreted as the average aggregate E and S disclosure of the firm. As for the individual scores, S has an average score of 32%, and E of 22%. The mean values of lagged E and lagged S are 23% and 33% respectively. The average slack is 6.2, equivalent to the mean value of GBP 494 million. Average ROS

and ROE are 15% and 24% respectively. The mean value of lagged ROS and lagged ROE are 16% and 26%. Average firm size is 9.29 (i.e., about 10851 employees). The average leverage is 25%. The mean values of strategic shareholdings and financial activities are 20% and 2% respectively (i.e., 20% of total shares in issue are held by strategic shareholders, and 2% of total assets are generated from sales or issue of common and/or preferred stock during the year). The mean of the log of media exposure is 1.6. In other words, the average number of environmental news to which a firm is exposed in one year is 5. All median values are very closed to mean values, which indicates that the sample is not affected by outliers. The median values are normally distributed. Full definition of variables used and their data sources are given in Appendix 3. Of note, the number of observations for each variable varies slightly, based on the availability of data for the variable.

The pair-wise correlation matrix is displayed in Table 4.3. Table 4.3 shows a high correlation among ES, E, and S score and their lagged values, which implies stickiness of E and S scores across years. In other words, it seems that once a firm sets a precedence of voluntary reporting in a particular area, it tends to continue doing so in subsequent periods (consistent with the costs of commitment argument). It is worth mentioning the relationship between profitability and environmental/social score. It can be seen that there is a positive link between ROS and E score, while lagged ROS is positively correlated with E, ES and lagged E scores. Although there is no significant link between profitability and social score, the sign with respect to this relationship is positive. As mentioned in the section 4.3.2 'measurement of variable', there is moderately high correlation between firm size and slack (0.65) as well as between firm size and media exposure (0.67). Hence, I performed variance inflation factor (VIF) checks for all regression analyses to ensure that there are no multicollinearity concerns, and all values of VIF tests are less than 10 (VIFs exceeding 10 are signs of serious multicollinearity requiring correction).

Table 4.3 Pair-wise correlation matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1 ES	1.00														
2 E	0.91***	1.00													
3 S	0.90***	0.64***	1.00												
4 ES _{t-1}	0.92***	0.84***	0.84***	1.00											
5 E _{t-1}	0.83***	0.88***	0.62***	0.91***	1.00										
6 S _{t-1}	0.85***	0.63***	0.91***	0.90***	0.64***	1.00									
7 Slack	0.60***	0.52***	0.56***	0.64***	0.57***	0.59***	1.00								
8 ROS	0.05	0.07*	0.01	0.07	0.08	0.02	0.02	1.00							
9 ROE	0.05	0.05	0.05	0.05	0.03	0.06	0.00	0.20***	1.00						
10 ROS _{t-1}	0.10***	0.12***	0.05	0.08	0.10**	0.02	0.04	0.28***	0.03	1.00					
11 Size_emp	0.44***	0.40***	0.40***	0.45***	0.42***	0.41***	0.65***	-0.21***	0.00	-0.20***	1.00				
12 Leverage	0.00	0.01	-0.01	0.03	0.02	0.01	-0.04	0.01	0.14***	0.06	0.12***	1.00			
13 Fin_acts	0.01	0.02	0.00	-0.01	0.00	-0.01	-0.02	-0.03	-0.06	0.02	-0.08**	-0.08*	1.00		
14 Str_holds	-0.26***	-0.28***	-0.18***	-0.29***	-0.30***	-0.22***	-0.31***	0.04	0.02	0.03	-0.22***	-0.08**	-0.09**	1.00	
15 Media	0.55***	0.49***	0.51***	0.59***	0.52***	0.55***	0.66***	0.06	0.04	0.06	0.48***	0.07*	-0.02	-0.22***	1.00

Notes: : ES denotes the sum of environmental and social disclosure scores; E denotes environmental disclosure; S denotes social disclosure; ES_{t-1}, E_{t-1} and S_{t-1} refer to one year lagged ES, E and S score respectively; Slack is measured as the natural logarithm of the sum of cash & short term investment and total receivables; ROS denotes the ratio of earnings before interest and taxes to net sales; ROE denotes the ratio of net income before preferred dividends minus preferred dividend requirement to last year's common equity; ROS_{t-1} refers to one year lagged ROS; Size_emp denotes firm size and is measured as the natural logarithm of employee number; Leverage is defined as the ratio of total debt to total assets; Fin_acts is defined as financial activities and measured as the ratio of net proceeds from sale/issue of common and/or preferred stock during the year to total assets at the beginning of the year; Str_holds refers to strategic shareholdings and is measured as the percentage of total shares in issue held strategically and not available to ordinary shareholders (holdings of 5% or more are counted as strategic); Media denotes media exposure and is measured as the natural logarithm of the number of environmental news exposed by media plus one. *, **, *** indicates significance at the .10, .05, .01 levels respectively.

4.5.2 Regression analysis

Table 4.4 shows the results of testing H1-H6 using two profitability measures ROS and ROE¹³.

Table 4.4 Tobit regressions explaining ES/E/S score (Equation 4-1)

	Predicted Sign	Dependent variable					
		ES		E		S	
		(1)	(2)	(1)	(2)	(1)	(2)
Intercept		-7.53 (-0.97)	-6.30 (-0.78)	-9.59** (-2.02)	-7.73 (-1.56)	2.14 (0.49)	1.39 (0.32)
ROS	+	2.18 (0.80)		3.55*** (2.52)		-1.49 (-0.96)	
ROE	+		3.75* (1.63)		2.09** (1.99)		1.85 (1.22)
Slack	+	3.47** (2.44)	3.52*** (2.60)	1.51** (2.00)	1.66** (2.23)	1.85** (2.23)	1.78** (2.27)
Size_emp	+	3.21** (2.32)	3.09** (2.27)	1.77** (2.38)	1.50** (1.95)	1.55* (1.91)	1.70** (2.22)
Leverage	-	-2.65 (-0.42)	-6.09 (-0.81)	-3.04 (-0.86)	-3.87 (-0.86)	-0.42 (-0.11)	-3.45 (-0.89)
Fin_acts	+/-	-8.95 (-0.64)	-10.55 (-0.73)	0.78 (0.08)	-0.71 (-0.08)	-9.30 (-1.42)	-9.34 (-1.35)
Str_holds	-	-13.50** (-1.95)	-14.13** (-2.12)	-11.54*** (-2.92)	-11.93*** (-3.01)	-2.23 (-0.57)	-2.53 (-0.70)
Media	+	2.97*** (2.88)	2.73*** (2.65)	1.59*** (2.69)	1.45** (2.41)	1.42*** (2.50)	1.31** (2.36)
Industry effect		Yes	Yes	Yes	Yes	Yes	Yes
Year effect		Yes	Yes	Yes	Yes	Yes	Yes
N		592	566	594	568	601	575
Pse-R ²		7.09%	7.05%	6.24%	6.06%	6.92%	7.12%
F-test		16.77***	16.02***	12.48***	11.46***	14.42***	15.34***

Notes: ES denotes the sum of environmental and social disclosure scores; E denotes environmental disclosure; S denotes social disclosure; ROS denotes the ratio of earnings before interest and taxes to net sales; ROE denotes the ratio of net income before preferred dividends minus preferred dividend requirement to last year's common equity; Slack is measured as the natural logarithm of the sum of cash & short term investment and total receivables; Size_emp denotes firm size and is measured as the natural logarithm of employee number; Leverage is defined as the ratio of total debt to total assets; Fin_acts is defined as financial activities and measured as the ratio of net proceeds from sale/issue of common and/or preferred stock during the year to total assets at the beginning of the year; Str_holds refers to strategic shareholdings and is measured as the percentage of total shares in issue held strategically and not available to ordinary shareholders (holdings of 5% or more are counted as strategic); Media denotes media exposure and is measured as the natural logarithm of

¹³ I check the impact of missing observations on the results. First, I generate a new variable as the sum of all variables used on Table 4.4. If any value of the above variables is missing, then the new variable will have a missing value. Then I recode the new variable as a dummy variable i.e., if there is any missing value, it will be 1; if there is no missing value, it will be 0. Hence, 1) I check the number of observations left with non-missing values; 2) I run a summary statistics and compare with the original descriptive table; and 3) Re-run all regressions on Table 4.4 with non-missing values, and compare the results. The results show that there are 565 observations left with non-missing values. The summary statistics (e.g., mean values) are very closed to the original table. Finally, all results with non-missing values are similar to the results on Table 4.4. Therefore, the results are not affected by any missing values, and the descriptive statistics provided earlier are reliable to carry out the above analysis.

*the number of environmental news exposed by media plus one. The dependent variables are ES, E and S scores as indicated by the columns. Profitability measured as ROS is used in Model (1), and ROE is adopted in Model (2). T-statistics are in parentheses. *, **, *** indicates significance at the .10, .05, .01 levels respectively. Standard errors are computed with procedure allowing for clustering across observations corresponding to the same firms for different years.*

As Table 4.4 shows, when E score is the dependent variable, the coefficients on ROS and ROE are both positive and significant ($p < 0.05$). When ES is the dependent variable, the coefficient on ROE is positive and marginally significant ($p < 0.1$). However, no significant relation is found between operating profit and S score. Perhaps firms with higher ROS tend to make more proactive environmental investments and provide more environmental information in the current year. Social disclosures which pertain more to employee relations may not require significant current cash outlays, hence, may not be currently profit-sensitive. These findings largely support H1, and are consistent with both the actual as well as the opportunity costs hypotheses. First, consistent with the actual costs argument, it is found that profitable firms are better able to afford making higher and better environmental disclosures. Moreover, the findings of a positive link of both E and S disclosures with slack resources, suggests that such firms can also bear the opportunity costs of commitment implied by such disclosures. Managers in firms with more slacks are more likely to have access to resources which would allow them to honour their environmental and social commitments – thus lowering their opportunity costs of making such disclosures. Taken together, these findings are consistent with the economics based arguments that profitable firms with superior financial resources, particularly slack resources, tend to be in a better position to bear both the actual as well as the opportunity costs of making specifically higher environmental disclosures. Furthermore, these results are consistent with slack resources theory, which suggests that firms with more slack resources are more ‘willing’ and ‘able’ to invest in environmental and social areas including E and S reporting. This behaviour of firms is consistent with the suggestions of Heal (2005) that to make the greatest impact, firms not only need to undertake CSR but also need to be ‘seen’ to be doing so – hence the need for relevant disclosure.

With respect to other variables, the results are found to be consistent with my expectations. Consistent with prior findings (Brammer and Pavelin, 2006 and Cormier et al., 2011), there is a positive relation of E and S disclosure scores with both size (H2) and media exposure (H6) in all regressions. These findings suggest

that larger firms with greater exposure to public media tend to provide more environmental and social information. This result is also consistent with the socio-political and legitimacy theory based arguments, implying that larger firms which are more in the public eye tend to legitimize their operations by providing more environmental and social information (Cho and Patten, 2007). Again, consistent with prior findings (Cormier et al., 2005), a negative relation is found between strategic shareholdings and ES and E disclosures (H5). This finding suggests that firms having more concentrated shareholdings with implied lower information asymmetry between the firm and its investors tend to disclose less ES and E information. It may also mean that firms with concentrated shareholdings are less stakeholder-oriented and tend to invest less in CSR related activities, hence, have less to report in these areas. Leverage (H3) and financial activities (H4) are not found to be related to either E or S disclosures.

Prior empirical evidence has emphasized industry effect. For example, Cho and Patten (2007) reveal that firms operating in environmentally sensitive industries such as oil exploration, paper manufacturing, chemical and allied products, petroleum refining and metals, disclose more non-litigation-related environmental information in order to achieve social legitimacy. Although the results with respect to industry effects are not reported, there are some significant results worth mentioning. Consistent with existing literature - those industries with a high environmental impact tend to make more environmental disclosure (Brammer and Pavelin, 2008), the findings of this study also suggest that industry effects matter for firms' environmental and social disclosures. Generally speaking, companies in the Basic materials, Consumer goods, Health care and Utilities industries provide more environmental and social related information, while companies in the Telecommunications and Technology industries provide less environmental and social related information. The VIF tests of all regressions are less than 10, thus there is no multicollinearity issue for above results.

Table 4.5 reports the results of Granger causality test with respect to ES, E and S score and firm profitability. There is no evidence of causality either ways using ROE as a profitability measure, which may be due to potential multicollinearity between

ROE and lagged ROE¹⁴. However, there is some evidence of causality using ROS as a profitability measure, which is reported as follow:

Table 4.5 Granger causality test (Equation 4-2 and 4-3)

	Dependent variable					
	ES	ROS	E	ROS	S	ROS
Intercept	-4.56 (-1.21)	0.45* (1.77)	-3.98 (-1.57)	0.56*** (2.54)	-1.60 (-0.66)	0.58** (2.30)
ES		-0.001 (-1.02)				
ES _{t-1}	0.93*** (35.19)	0.002 (1.04)				
E				0.001 (0.85)		
E _{t-1}			0.88*** (26.93)	0.002 (0.44)		
S						-0.005 (-1.57)
S _{t-1}					0.86*** (23.37)	0.003 (1.47)
ROS	-1.22 (-1.25)		0.47 (0.69)		-1.58 (-1.42)	
ROS _{t-1}	1.66*** (2.59)	0.14 (1.29)	0.76 (0.82)	0.13 (1.06)	0.91* (1.63)	0.14 (1.34)
Slack	-0.46 (-0.74)	0.01 (0.85)	-0.49 (-1.23)	0.01 (0.84)	0.13 (0.33)	0.02 (1.12)
Size_emp	1.47*** (2.69)	-0.05 (-1.47)	1.05*** (2.91)	-0.05 (-1.62)	0.69* (1.80)	-0.04 (-1.59)
Leverage	1.96 (0.74)	0.08 (1.37)	0.93 (0.49)	0.08 (1.42)	2.29 (1.35)	0.10* (1.91)
Fin_acts	-0.59 (-0.12)	-0.09 (-0.92)	3.33 (0.83)	-0.09 (-0.93)	-4.29 (-1.44)	-0.14 (-1.30)
Str_holds	1.45 (0.50)	0.08 (0.76)	-0.60 (-0.27)	0.09 (0.75)	1.63 (0.96)	0.07 (0.72)
Media	-0.38 (-0.74)	0.01 (0.60)	0.06 (0.17)	0.01 (0.57)	-0.33 (-1.13)	0.01 (0.67)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
N	365	365	366	366	372	372
Clusters	175	175	175	175	177	177
Pre-R ² / (R ²)	22.04%	16.19%	19.79%	16.96%	22.36%	17.17%
F-test	245.28***	20.45***	139.19***	19.70***	142.80***	24.96***

Notes: This table reports the results of causality models with Tobit specifications when dependent variable is ES, E or S score. ES denotes the sum of environmental and social disclosure scores; E denotes environmental disclosure; S denotes social disclosure; ES_{t-1}, E_{t-1} and S_{t-1} refer to one year lagged ES, E and S score respectively; ROS denotes the ratio of earnings before interest and taxes to net sales; ROS_{t-1} refers to one year

¹⁴ The pair-wise correlation between ROE and lagged ROE is 0.37 (p=0.00). Nelling and Webb's (2009) findings imply that current ROA and lagged ROA are highly correlated. When both of them are included as independent variables in the regression to test causality between ROA and CSR score, no significant result is found between lagged ROA and CSR score.

*lagged ROS; Slack is measured as the natural logarithm of the sum of cash & short term investment and total receivables; Size_emp denotes firm size and is measured as the natural logarithm of employee number; Leverage is defined as the ratio of total debt to total assets; Fin_acts is defined as financial activities and measured as the ratio of net proceeds from sale/issue of common and/or preferred stock during the year to total assets at the beginning of the year; Str_holds refers to strategic shareholdings and is measured as the percentage of total shares in issue held strategically and not available to ordinary shareholders (holdings of 5% or more are counted as strategic); Media denotes media exposure and is measured as the natural logarithm of the number of environmental news exposed by media plus one. T-statistics are in parentheses. *, **, *** indicates significance at the .10, .05, .01 levels respectively. Standard errors are computed with procedure allowing for clustering across observations corresponding to the same firms for different years.*

Table 4.5 shows that when ES score is the dependent variable, a positive and significant relationship is found between ES score and lagged ROS. In other words, lagged ROS 'Granger causes' ES score, which implies that firms with higher ROS in prior year provide more ES information in current year. Similar result is generated with respect to social disclosure. However, when ROS is the dependent variable; neither ES/E/S score nor lagged ES/E/S score is significant, which indicates that causality tends to run from profitability to ES and S disclosures. These findings are quite interesting when compared to the findings in Table 4.4. Taken together, these findings suggest that while current operations and current operating performance matter for current environmental disclosures, past operating performance drive current social disclosures. To explain these results, one could reason that current operations impact current environmental performance and current environmental disclosures, while results of past operating performance and past investments in social responsibility arena such as investments in employee training (whose effects only become subsequently evident) are subsequently reported. All VIF tests are less than 10.

4.5.3 Robustness test

Additional control: stakeholder sensitive governance

Drawing upon the ideas of stakeholder theory, first proposed by Freeman (1984) and recently built upon by Jensen (2010), it can be argued that firms with boards which better reflect governance and stakeholder-sensitivity are likely to have higher environmental and social disclosures. Jensen (2010) argues that environmental and social strategy is designed at the board level. In order to maximise value of a firm, boards not only need to satisfy but enlist the support of all corporate stakeholders, including employees, suppliers, customers, and local communities. Sharing relevant information with these stakeholders via higher disclosures including environmental

and social disclosures is important in enlisting this support. Accordingly, the extent to which the board reflects this commitment to key stakeholders by for example, complying with GRI criteria (i.e., comprehensive guidelines about a firm's environmental and social reporting); by disclosing its political donations; and by including women on the board (it is argued that women are concerned primarily with the welfare of other people, helpfulness, kindness, sympathy, sensitivity, nurturing and gentleness Eagly et al., 2003), would have a significant impact on its environmental and social disclosures.

There is also a suggestion in the disclosure literature that firms which have better quality of corporate governance are likely to be more transparent and accordingly make higher and better quality environmental and social disclosures (Brammer and Pavelin, 2008; Rankin et al., 2011; Cormier et al., 2011). For example, Rankin et al. (2011) find the quality of corporate governance relates to the decision to disclose GHG information. They argue that a firm with an environmental committee is more likely to publicly disclose their emissions levels, and presents more credible disclosure in a voluntary disclosure regime to indicate its commitment to climate change. Indeed, they find firms that had instituted an environmental committee are more likely to provide more credible disclosures about climate change. In addition, Cormier et al. (2011) find a positive association between board size and environmental and social disclosures, as well as a positive relation between audit committee size and social disclosure.

To test this, the aggregated governance 'G' disclosure score from Bloomberg is added in Equation (4-1), while keeping all other variables the same. The G score from Bloomberg captures the governance related disclosures of a firm, and is value weighted with higher weights assigned to factors like board independence and other such disclosures of good governance practices. The 'G' score as one of the independent variable covers some key board recommendations that the UK code of corporate governance recommends firms to comply with, including 'independent' director representation and separation of CEO and chair position. It also covers aspects that clearly reflect a board's own stakeholder orientation. These include commitment to: board diversity, as measured by the presence of women on board; promoting transparency and trust, via disclosing details of political donations; and demonstrating overall stakeholder sensitivity, via disclosing ethics policy and

importantly adherence to GRI criteria related to environmental and social reporting. Hence, based on the data points covered in the G score it is reasonable to assume, that the higher a firm's G score, the more stakeholder committed the firm's board is likely to be.

It is found the G score to be highly positively significant in all models, that is those modelling ES, E and S, suggesting that firms making higher governance disclosures (i.e., more stakeholder sensitive governance), are also more likely to make higher environmental and social disclosures. These findings not only support the theoretical arguments of Jensen (2010), but also lend further support to the empirical findings of Cormier et al. (2011) who emphasize the role of governance in promoting environmental and social disclosures. By using an aggregated measure of stakeholder sensitive governance, the results indicate overall governance score of a firm has a positive effect on its environmental and social disclosures. However, the main results are reported without G, as it was found to be a source of multicollinearity problem in causality tests. Hence, to keep the main results and causality test results comparable, main results are reported without G in Table 4.4.

4.6 Discussion and conclusions

In this chapter, the link between a firm's environmental and social disclosures and its operating profitability is examined. Consistent with H1, it is found that more profitable firms tend to make more environmental and social disclosures. These findings are consistent with the accounting and economics based arguments that environmental and social disclosures are a real as well as an opportunity cost that more profitable firms with higher slack resources are better able to afford. Moreover, the result of Granger causality test reveals that while current operating performance (which is relevant for current environmental impact) matter for current environmental disclosures; it is the past operating performance that drives current social disclosures. The reason for the latter finding could be that effects of past profitability and presumably past investments in social arena (like investments in employee training) become apparent only in the subsequent period, which is then reported. From an aggregated level, a firm's environmental and social disclosure is driven by its prior operating profitability. To the best of my knowledge, this empirical chapter is the first UK study using Granger causality methodology to examine the causal

relation between ESD and operating profitability, and provides some empirical evidence that causality runs from prior profitability to ESD.

It is important to point out two limitations of the analysis in this chapter. One is whether higher disclosures imply better underlying environmental and social performance. While some earlier studies such as Patten (2002a) suggests that poor environmental performers tend to disclose more environmental information, in order to gain socio-political 'legitimacy' for their operations; there is now a growing body of research that shows a positive relation between higher environmental disclosures and better environmental performance (e.g., Al-Tuwaijri et al., 2004; Clarkson et al., 2008; and Clarkson et al., 2011) – hence support for the assumption. The second issue to consider is whether more is better in itself. In other words, do higher disclosures convey more relevant information or do they serve to confound stakeholders? As Bloomberg scores are based largely on objective and industry relevant environmental and social measures, higher scores should reflect an effort on the part of firms to promote accountability, transparency and trust between itself and its various stakeholders. Hence, the assumption is that the more environmental and social disclosure is better. In addition, a subsample of year 2009 has been analysed. Based on Clarkson et al. (2008) disclosure framework, I create eight CSR disclosure indicators, manually collect the information from firms' sustainability reports or websites, read and codify the information. The aggregated score has also been used as a replacement of CSR strategy measurement in Chapter 6.

In the next chapter, the link between a firm's environmental and social disclosures and its market value, employee productivity and carbon eco-efficiency are examined. The analysis of disclosures with employee productivity and carbon eco-efficiency provides some support for the assumption (in this chapter) of a positive link between social and environmental disclosures and corresponding performance.

Chapter 5: Environmental and social disclosures and firms' market values, employee productivity and carbon eco-efficiency

5.1 Introduction

As shown in Chapter 4, the link between firms' ESD and their operating profitability has been tested within the context of the determinants of ESD disclosure. However, less is known about the link between firms' ESD and their market values. Moreover, prior analysis in Chapter 4 assumes ESD to reflect superior E and S performance. In this chapter, I provide some support for this assumption by testing the link between ESD and employee productivity and carbon eco-efficiency, as measures of S and E performance respectively.

With increasing pressure on businesses from socially responsible investors as well as from other stakeholders to address their environmental and social related responsibilities, developing a better understanding of the economic relevance of environmental and social disclosures becomes imperative. From a capital market's perspective, public disclosures of how a firm addresses its environmental and social challenges can have significant financial implications. To the extent that these disclosures reveal a firm's current environmental and social performance as well as its future potential, investors can gauge how well the firm is currently managing its environmental and social risks, and how well it is equipped to tackle these in the future.

Based on above arguments, some studies have examined the link between a firm's environmental disclosures and its market performance (e.g., Freedman and Patten, 2004; Lorraine et al., 2004; Shane and Spicer, 1983; Stevens, 1984). All of these studies find a negative stock market response to the release of environmental information. These findings however, are quite contrary to the expectations based on voluntary disclosure theory (Verrecchia, 1983) that higher and better quality environmental (and social) disclosures should help reduce information asymmetry between the firm and its investors (Al-Tuwaijri et al., 2004; Brammer and Pavelin, 2008). Recent work in this area however, has been more in line with this theoretical reasoning. For example, Cormier et al. (2011) find that environmental and social disclosures help reduce the information asymmetry (as measured by the stock's bid-ask spread and its share price volatility) between the firm and its investors. Hence, it

can be argued that higher and better quality of environmental and social disclosures can be a reflection of superior environmental and social performance (Verrecchia, 1983), which leads to lower information asymmetry between a firm and its investors, and lower its firm risks, thus higher its market value. In this chapter, I extend this analysis by examining the link between a firm's environmental and social disclosures and its market value.

In this chapter, I attempt to explore the relation between a firm's environmental and social disclosures and its market value (i.e., whether a firm's environmental and/or social disclosures affect its market value is examined). As mentioned in Chapter 3, I also test the link between ESD and ESP from two aspects (i.e., whether more environmental (social) disclosure reflects better environmental (social) performance). One is the link between a firm's social disclosure and its employee productivity; the other is the association between a firm's environmental disclosure and its carbon eco-efficiency. A longitudinal dataset on UK listed firms for the years 2005-2009 is used to test these three sets of relationships in this study.

This study makes a number of contributions to existing literature. First, it finds a positive association between combined ES and S disclosures and a firm's market value. The finding in some ways is surprising, given the preponderance in the corporate social responsibility literature on studying the association between environmental performance and economic performance. The findings suggest that contrary to environment, it is the social disclosures that the market values. In other words, investors seem to care not about the environment alone per se, but the overall approach that the firm takes towards its key stakeholders (particularly the employees), as revealed by its social disclosures. Moreover, the results of sub-tests provide further evidence of the economics based disclosure theory, that is, more environmental (social) disclosure reflects better environmental (social) performance captured by a firm's better carbon eco-efficiency (higher employee productivity).

5.2 Hypotheses development

According to Jensen's (2010) enlightened stakeholder theory, in order to maximize a firm's market value, managers who play a critical role in leading and sustaining the firm's strategic vision, must not only satisfy, but also enlist the support of all

corporate stakeholders. In other words, meet other stakeholders' needs such as employees and the environment to assure the long-term sustainability of the firm.

5.2.1 ESD and firms' market values

With the growing investor demand for better disclosures, Lee and Hutchison (2005) comment that for gaining credibility, investors require disclosures to be externally audited. It appears that firms are now increasingly responding to the growing societal and shareholder pressures, by making higher and better quality environmental and social disclosures.

From a capital market's perspective, public disclosures of how a firm addresses its environmental and social challenges can have significant financial implications. To the extent that these disclosures reveal a firm's current environmental and social performance as well as its future potential, investors can gauge how well the firm is currently managing its environmental and social risks, and how well it is equipped to tackle these in the future. Based on the argument that environmental disclosures can have significant financial implications such as cash flow outlays related to pollution abatement costs and/or investments in environmentally friendly technologies (Freedman and Patten, 2004), some studies have examined the link between a firm's environmental disclosures and its share price performance (Freedman and Patten, 2004; Lorraine et al., 2004; Shane and Spicer, 1983; Stevens, 1984). All find a negative stock market reaction to release of environmental information. These findings are quite contrary to the expectations based on voluntary disclosure theory (Verrecchia, 1983) that higher and better quality i.e., hard environmental (and social) disclosures should help reduce information asymmetry between the firm and its investors (Al-Tuwaijri et al., 2004; Brammer and Pavelin, 2008; Cormier et al., 2011). Perhaps, the specific disclosure items or regulatory events used to measure disclosure in most such studies, as pointed out by Aerts et al. (2008) could be responsible for the negative stock market impact documented. For example, Shane and Spicer (1983) study the stock market reaction to the negative environmental publicity received by firms which feature in the Council of Economic Priorities (CEP) reports in the US. Consistent with their expectations, they did find a negative abnormal return for these firms on day t-1 and t-2 of the event date t. Lorraine et al. (2004) focus on the market reaction to publicity about environmental fines and environmental awards for a sample of 32 such events. They find that while the

market ignores good news, it does react to news about fines particularly to relatively high fines, for up to one week post release of the news. Along similar lines, Freedman and Patten (2004) who examine the reaction of the market to revisions in the Clean Air Act in 1989 in US, find that companies which disclosed higher levels of size-adjusted toxic releases into the air suffered more negative market reactions than companies with better performance. However, they also find that this effect is mitigated for firms which made larger financial report environmental disclosures. In sum while prior evidence using event type methodology, documents a largely negative stock market reaction to specific disclosure items, there is some early evidence which suggests that this impact is reduced for firms which make higher and detailed environmental disclosures in their annual reports (Freedman and Patten, 2004).

More recent work using comprehensive and objective measures of a firm's environmental and social disclosures is more in line with the predictions of the voluntary disclosure theory and the arguments that better and higher quality disclosures should help reduce information asymmetry between the firm and its investors. For instance, Cormier et al. (2011) use measures of environmental and social disclosures which are classified into 'hard' and 'soft' disclosure items along the lines of Clarkson et al. (2008). They then develop disclosure ratings based on a system which assigns higher weight to hard quantitative items. Using these disclosure ratings, they find evidence that these disclosures help reduce the information asymmetry between the firm and its investors, as measured by the firm's share price volatility and its bid-ask spread. They also find evidence that social and environmental disclosures reinforce each other, even substituting each other in reducing this information asymmetry. Yet, it is important to note that social disclosures, to date have received relatively scant attention in this literature.

While the capital market implications of environmental disclosures have received considerable attention, the corresponding work on social disclosures is relatively rare (some notable exceptions being Cormier et al., 2009; Cormier et al., 2011; Freedman and Stagliano, 1991). While all of these studies find that markets do react to social disclosures, the evidence is mixed. Freedman and Stagliano (1991) find a negative reaction of the market to disclosures related to pollution abatement costs for health and safety reasons in the cotton industry in US in 1981. Cormier et al.

(2009) find that while social disclosures help reduce the information asymmetry between the firm and its investors, they find no such link with the firm's market value as measured by its Tobin's Q. Similar role in reducing information asymmetry is found by Cormier et al. (2011). It is important to note here that all of these studies find the market to react mainly to hard quantitative disclosures.

In line with the market's expectations, increasingly, firms are making objective and hard social disclosures which convey important information about how well the firm is addressing the expectations of its key stakeholders particularly its employees. A strong reputation in the social arena, as reflected by higher and better quality social disclosures, can help a firm attract and retain quality employees (Cormier et al., 2011), enhance employee morale and hence productivity (Siegel, 2009), and help reduce the distributional conflicts with these key stakeholders (Heal, 2005). Hence, reporting responsible social behaviour can help reduce the perceived social risks of the firm, with associated positive link with its market value. Social (and environmental) risks if not managed appropriately have the potential to cause severe damage to the firm's reputation; some well-known examples being those of Nike and Walmart (Heal, 2005) and that of the Bhopal disaster which research shows to have led to a major shift in the concerned firm's disclosure policies (Deegan, 2004).

Based on the preceding arguments, this chapter extends the analysis of Cormier et al. (2011) by analysing the impact of environmental and social disclosures on firm value. If as Cormier et al. (2011) find, environmental and social disclosures, reduce information asymmetry and hence perceived environmental and social risk, this should be reflected in higher valuation of firms making higher and better quality disclosures. Accordingly, it can be hypothesised in alternative form as follow:

H1: *Ceteris paribus*, firms with higher environmental and/or social disclosure scores tend to have higher market values.

5.2.2 Social disclosure and employee productivity

As mentioned earlier, this chapter also tests the link between social (environmental) disclosure and social (environmental) performance measured by employee productivity (carbon eco-efficiency). First, as discussed above, it can be argued that by making higher social disclosure, firm would increase its trustworthiness among its key stakeholders particularly employees which in turn would be reflected in higher

employee productivity (Siegel, 2009). Furthermore, as the social disclosure score developed by Bloomberg mostly captures objective measures of social performance; it can be argued that higher social disclosure can reflect a firm's superior social performance in relation to employee productivity.

Prior studies provide some theoretical arguments of a positive link between social disclosure and employee productivity. According to Perrini et al. (2009),

“CSR contributes to the bottom line via its favourable influence on a firm's relationships with its relevant stakeholders. Higher and better CSR disclosures can increase the trustworthiness of a firm and strengthen the relationships with stakeholders (e.g., increased employee satisfaction), which can decrease transaction costs and so lead to financial gain (e.g., decreased employee turnover, more eager talent pool, and strike avoidance)” (p.9).

Heal (2005) states a comprehensive list of the benefits that commentators have linked to CSR programs, including risk mitigation, waste reduction, improvement of relations with regulators, cost of capital reduction and improvement of human relations and increase of employee productivity. Furthermore, based on stakeholder analysis, Waddock and Graves (1997) propose that a tension exists between a firm's explicit costs (e.g., payments to bondholders) and its implicit costs to other stakeholders (e.g., product quality costs, environmental costs). They indicate a firm that attempts to lower its implicit costs by socially irresponsible actions will incur higher explicit costs, resulting in competitive disadvantage. However, for instance, an enlightened employee relations policy may have a very low cost, but can lead to substantial gains in morale and productivity, actually yielding a competitive advantage in comparison to less responsible firms. In addition, from an economic/strategic perspective on green management practices, Siegel (2009) argues that firms can use environmental and social related tactics to achieve their strategic goals such as increase of productivity and share price etc. Therefore, it can be hypothesized that;

H2: Ceteris paribus, firms with higher social disclosure scores tend to have higher employee productivity.

5.2.3 Environmental disclosure and carbon eco-efficiency

Prior literature examining the link between environmental disclosure and environmental performance provides mixed results. From economic based disclosure theory, Clarkson et al. (2008 and 2011) find a positive relation. From socio-political based disclosure theory (e.g., stakeholder theory or legitimacy theory), Brammer and Pavelin (2006 and 2008) find a negative association between the quality of environmental disclosure and environmental performance measured as the amount of environmental fine (i.e., the ratio of aggregated level of fines incurred for environmental transgressions over 4 years' period to firms' total assets). Furthermore, Patten (2002a) uses legitimacy theory but a different measure of environmental performance measurement (i.e., Toxics Release Inventory (TRI) data, normalized by sales) to proxy for environmental performance. Using a sample of 131 US firms from 24 different industries, and a modified Wiseman index measure and line count of environmental disclosures in 1990 annual reports, Patten finds that TRI/sales are positively linked with both measures of environmental disclosures, suggesting a negative relation between a firm's environmental performance and environmental disclosures.

However, Clarkson's et al. (2008) adapt previous research and use similar environmental performance measurements (i.e., the ratio of total toxic waste treated, recycled or processed to total toxic waste generated, and the ratio of TRI to firm sales). Environmental disclosure score is based on an environmental disclosure Index developed from GRI guidelines. Consistent with economic based disclosure theory, they find a positive relationship between environmental disclosure and environmental performance. The proxies for environmental performance of Clarkson et al. (2008) seem to be more appropriate, as they are the actual pollution discharge data published by local Environmental Protection Agency (argued by Clarkson et al., 2008). In this chapter, carbon eco-efficiency (i.e., carbon intensity) is measured in the similar way as Clarkson et al. (2008), that is, the ratio of carbon emission (Scope 1 and Scope 2) to total sales. It can be argued that firms with higher environmental disclosure scores would be better environmental performers, in other words, would tend to have better eco-efficiency (i.e., lower carbon intensity). Thus consistent with economics based disclosure theory and Clarkson et al.'s (2008) findings, it can be hypothesized that,

H3: Ceteris paribus, firms with higher environmental disclosure scores tend to have lower carbon intensity.

5.3 Data, sample and methodology

5.3.1 Sample and data

In this study, the same dataset as used in the analysis in Chapter 4 is used (i.e., a pooled cross-section and time series dataset). The sample consists of FTSE 350 index companies covering 2005-2009 excluding financial institutions. Based on the availability of environmental and social disclosure data, the final sample consists of 629 firm-year observations. FTSE/DJ single-digit industry classification benchmark (ICB) is adopted, thus there are 9 industry classifications in the sample. The sample represents a wide range of industries over five years. As mentioned in Chapter 4, environmental and social disclosure scores are obtained from Bloomberg. Some new variables are included in this study such as market value Q ratio, employee productivity, carbon intensity measures and analyst coverage. Accounting data is from Worldscope and financial data is from Datastream. Analyst coverage is collected from IBES. It is worth pointing that firms' carbon emission data is collected from the Carbon Disclosure Project website and published reports. Due to data availability issue, only year 2008 and 2009 emission data is available for the sample companies.

5.3.2 Models tested and variables

To test H1, that is the link between a firm's market value (dependent variable) and its ES/E/S disclosure score (independent variables), the OLS regression model is specified as follows;

$$\text{Market value}_{i,t} = \beta_0 + \beta_1 \text{ES/E/S Score}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{ROA}_{i,t} + \beta_4 \text{Leverage}_{i,t} + \beta_5 \text{Financial activities}_{i,t} + \beta_6 \text{Strategic holdings}_{i,t} + \beta_7 \text{Analyst coverage}_{i,t} + [\text{Industry Dummies}] + [\text{Year Dummies}] + \varepsilon_{i,t} \quad (5-1)$$

In Equation (5-1), the dependent variable is market value measured by Tobin's Q. It is argued by Weir et al. (2002) that Q is a proxy for how closely shareholder and manager interests have been aligned. They state higher the value of Q, the more effective the governance mechanisms and the better the market's perception of the company's performance. Tobin's Q is measured as the ratio of total assets (02999)

plus market value of equity (MV) minus book value of equity (03501) to total assets (02999). The independent variable is ES/E/S disclosure score. The expected sign between the dependent variable and independent variable is positive. 'G' score is not included in this analysis, as governance-market performance link is already widely tested (e.g., Brown and Caylor, 2004; Gompers et al., 2003) and the relationship is considered to be endogenous (Adams et al., 2010; Gompers et al., 2003; Agrawal and Knoeber, 1996).

Based on prior evidence, I control for firm size measured as log of sales (negative, see Lo and Sheu, 2007 and Weir et al., 2002), ROA (positive, see Adams and Mehran, 2005; Clarkson et al., 2011 and Guenster et al., 2011), leverage (negative, see Weir et al., 2002), financial activities (given lack of prior empirical evidence, no directional predictions are made in this regard), strategic shareholdings (negative, see Agrawal and Knoeber, 1996) and analyst coverage (positive, see Chung and Jo, 1996). Chung and Jo (1996) find that analyst coverage (number of analysts issuing earnings forecasts for the firm) as an effective monitoring device reduces agency costs and increases the firm value measured as Tobin's Q. Industry and time fixed effects are controlled in Equation (5-1). See Appendix 3 for definition and measurement for each control variable.

To test H2 and H3, accordingly the OLS regression models are developed as follows;

$$\text{Employee Productivity}_{i,t} = \beta_0 + \beta_1 \text{S Score}_{i,t-1} + \beta_2 \text{G}_{i,t} + \beta_3 \text{Size}_{i,t} + \beta_4 \text{ROS}_{i,t} + \beta_5 \text{Leverage}_{i,t} + \beta_6 \text{Capex}_{i,t} + [\text{Industry Dummies}] + \varepsilon_{i,t} \quad (5-2)$$

$$\text{Carbon Intensity}_{i,t} = \beta_0 + \beta_1 \text{E Score}_{i,t-1} + \beta_2 \text{G}_{i,t} + \beta_3 \text{Size}_{i,t} + \beta_4 \text{ROS}_{i,t} + \beta_5 \text{Leverage}_{i,t} + \beta_6 \text{Capex}_{i,t} + [\text{Industry Dummies}] + \varepsilon_{i,t} \quad (5-3)$$

In equation (5-2), the dependent variable is employee productivity which is measured as the natural logarithm of sales per employee ratio (as also used by Huselid, 1995; Huselid et al., 1997; Hillier et al., 2007). It is worth mentioning that there are different ways of measuring employee productivity such as survey based employee productivity measurement. However, as argued by Huselid (1995),

“The logarithm of sales per employee is a widely used measure of organizational productivity and was adopted to enhance comparability with prior work. The primary advantages of this measure are that it provides a single index that can be used to compare firms’ productivity as well as to estimate the dollar value of returns for investments in High Performance Work Practices” (p.651).

Further, as reviewed by Ho (2005), the variable 'sales per employee' has been used in past literature (Buckley et al., 1988; Bhagat and Black, 1999). Thus in this study, the logarithm of sales per employee ratio is used to measure employee productivity. The independent variable is the lagged S score. The reason to include lagged S variable is that past investments in social arena are likely to manifest in improvements in performance in the future.

A number of variables are controlled in equation (5-2) including stakeholder sensitive governance, firm size, operating profitability, leverage and capital expenditure¹⁵. It can be argued that a firm with stakeholder sensitive governance tends to care more about its employees, which can affect employee morale and hence increase employee productivity. Huselid (1995) finds a positive and significant link between employee motivation and productivity. Thus a positive relation is predicted between stakeholder governance and employee productivity. Huselid (1995) investigates the impact of human resource management practices on turnover, productivity and corporate financial performance. In the productivity regression model, consistent with Huselid (1995)'s findings, I also control for firm size measured as logarithm of total employee number (negative) and capital intensity (positive). Huselid (1995) also argues that '*productivity is not synonymous with profitability, however; a firm can go bankrupt maximizing sales per employee while ignoring current costs*' (pp.651-652). Thus a negative relation is predicted between profitability and employee productivity. It can also be argued that firms with higher leverage tend to have less money available to invest in employee related benefits and welfare (e.g., costs related to employee training and development, health and safety issues), which may negatively affect employee morale and productivity. Hence, a negative association is expected between leverage and employee productivity. Industry dummies are included (Delmas and Pekovic, 2012).

In equation (5-3), the dependent variable is carbon intensity which is measured as the ratio of carbon emission (scope 1 and scope 2) to sales (as also used by

¹⁵ Capital expenditure is measured as the ratio of capital expenditures (04601) to total sales (01001). It represents the funds used to acquire fixed assets other than those associated with acquisitions, including but is not restricted to additions to property, plant and equipment and investment in machinery and equipment. This ratio also proxies a company's asset newness to some extent, since more funds used to acquire additional property, plant and equipment imply that the newer assets are used in the company.

Hoffmann and Busch ¹⁶, 2008; Busch and Hoffmann, 2011). The independent variable is the lagged E score. Similarly, I control for stakeholder sensitive governance, firm size, operating profitability, leverage and capital expenditure.

It can be argued that firms with stakeholder sensitive governance tend to care more about its stakeholders including its environmental performance. Hence, a positive link is predicted between G and environmental performance. Clarkson et al. (2011) use similar measure to capture environmental performance. Based on Clarkson et al.'s findings, firm size is negatively linked with environmental performance. The association between leverage (capital expenditure) and environmental performance is found to be negative (positive) but insignificant. Profitability measured as ROA is positively related to environmental performance. Clarkson et al. (2011) argue that firms with sufficient financial resources measured as profitability (ROA), liquidity (operating cash flow) and leverage, tend to have better environmental performance. However, it can be argued that firms with more sales related profitability (i.e., ROS) have higher environmental impact (i.e., emit more carbon). Thus the link between ROS and environmental performance is expected to be negative. It can also be argued that the more money spent on newer equipment and technologies in production (i.e., capital expenditure), the lower would be the environmental impact of the firm. In other words, firms with newer, cleaner technologies are likely to have a superior environmental performance. Hence, a positive relation is expected between capital expenditure and environmental performance. In equation (5-3) environmental performance is measured as carbon intensity ratio (i.e., higher carbon intensity, worse environmental performance or less carbon eco-efficient). Accordingly, the predicted sign (i.e., inversed relations) with respect to each control variable is stated as follows: G (negative), firm size (positive), ROS (negative), leverage (positive) and capital expenditure (negative). Industry dummies are also included in equation (5-3). Petersen (2009) two-way standard errors clustering (firm and year) approach is used to test H2 and H3.

¹⁶ Carbon intensity relates to a company's physical carbon performance and describes the extent to which its business activities are based on carbon usage for a defined scope and fiscal year (Hoffmann and Busch, 2008 p.509).

5.4 Results

5.4.1 Descriptive and correlation statistics

Table 5.1 provides the descriptive statistics for all variables used in the analyses.

Table 5.1 Descriptive statistics

Variable	Observation	Median	Mean	S.D.	Min	Max
Q ratio	627	1.55	1.88	1.35	0.38	18.93
Productivity	621	5.03	5.17	0.96	2.18	9.65
Carbon intensity	169	0.07	0.44	1.42	0	17.3
E	619	19.51	22.02	13.53	2.33	63.57
S	627	28.07	32.10	12.87	4.69	70.18
G	629	51.79	51.56	8.50	5.36	76.79
E _{t-1}	381	20.93	22.72	13.76	2.33	62.79
S _{t-1}	388	28.07	32.84	13.16	4.69	70.18
ROA	627	0.11	0.13	0.14	-0.46	1.31
ROS	622	0.12	0.15	0.27	-1.28	5.42
Size_emp	622	9.34	9.29	1.62	2.57	13.30
Size_sales	622	14.38	14.47	1.54	10.31	19.56
Leverage	627	0.23	0.25	0.19	0	1.33
Capex	622	0.04	0.09	0.20	0	3.36
Fin_acts	627	0.002	0.02	0.07	-0.01	0.85
Str_holds	629	0.16	0.20	0.17	0	0.83
Analyst coverage	626	13	13.76	6.05	1	35

Notes: Q ratio is defined as total assets plus market value of equity minus book value of equity divided by total assets; Productivity refers to employee productivity and is measured as natural logarithm of sales per employee ratio; Carbon intensity is measured as the ratio of carbon emission (scope 1 and scope 2) to sales; E denotes environmental disclosure; S denotes social disclosure; G is defined as stakeholder sensitive governance disclosure; E_{t-1} and S_{t-1} refer to one year lagged E and S score respectively; ROA is defined as the ratio of earnings before interest and taxes to total assets at the beginning of the year; ROS denotes the ratio of earnings before interest and taxes to net sales; Size_emp denotes firm size measured as natural logarithm of employee number; Size_sales denotes firm size measured as natural logarithm of total sales; Leverage is measured as the ratio of total debt to total assets; Capex is defined as the ratio of capital expenditures to net sales; Fin_acts denotes financial activities and is measured as the ratio of net proceeds from sale/issue of common and/or preferred stock during the year to total assets at the beginning of the year; Str_holds refers to strategic shareholdings and is measured as the percentage of total shares in issue held strategically and not available to ordinary shareholders (holdings of 5% or more are counted as strategic); Analyst coverage denotes number of analysts following firms' earning.

As Table 5.1 shows the mean values of Q ratio is 1.88. The average employee productivity is 5.17 after taking logarithm (i.e., equivalent to 175037 GBP per employee) and the average carbon intensity is 0.44 (equivalent to 440 tonnes of carbon emission per 1 GBP of sales). As many variables are described in the 'descriptive statistics' section in Chapter 4, they are not discussed here. The mean value of ROA is 13%. The average firm size measured as natural logarithm of sales

is 14.47, which approximates 1.9 billion GBP of sales. On average, there are 14 analysts issuing earnings forecasts for a firm. Most median values are closed to mean values, which indicates that the sample is not affected by outliers and is normally distributed¹⁷. A plot of E/S/ES disclosure distribution is attached in Appendix 4. Of note, the number of observations for each variable varies slightly based on the availability of data for the variable¹⁸.

The pair-wise correlation matrices for testing H1, H2 and H3 are displayed in Table 5.2a, 5.2b and 5.2c respectively. As Table 5.2a, 5.2b and 5.2c shown, multicollinearity is not likely to be an issue for testing H1, H2 and H3.

Table 5.2 a Pair-wise correlation matrix for testing H1

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1 ES	1.00									
2 E	0.91***	1.00								
3 S	0.90***	0.64***	1.00							
4 Q ratio	-0.06	-0.09**	-0.01	1.00						
5 ROA	-0.05	-0.04	-0.04	0.53***	1.00					
6 Size_sales	0.61***	0.56***	0.54***	-0.33***	-0.16***	1.00				
7 Leverage	0.00	0.01	-0.01	-0.08*	-0.03	0.04	1.00			
8 Fin_acts	0.01	0.02	0.00	0.17***	-0.01	-0.11***	-0.08*	1.00		
9 Str_holds	-0.26***	-0.28***	-0.18***	0.06	0.10***	-0.30***	-0.08**	-0.09**	1.00	
10 Analyst coverage	0.49***	0.44***	0.44***	-0.04	-0.02	0.62***	0.11***	-0.05	-0.27***	1.00

Notes: ES denotes the sum of E and S scores; E denotes environmental disclosure; S denotes social disclosure; Q ratio is defined as total assets plus market value of equity minus book value of equity divided by total assets; ROA is defined as the ratio of earnings before interest and taxes to total assets at the beginning of the year; Size_sales denotes firm size measured as natural logarithm of total sales; Leverage is measured as the ratio of total debt to total assets; Fin_acts denotes financial activities and is measured as the ratio of net proceeds from sale/issue of common and/or preferred stock during the year to total assets at the beginning of the year; Str_holds refers to strategic shareholdings and is measured as the percentage of total shares in issue held strategically and not available to ordinary shareholders (holdings of 5% or more are counted as strategic); Analyst coverage denotes number of analysts following firms' earning. *, **, *** indicates significance at the .10, .05, .01 levels respectively.

¹⁷ It is worth pointing out that the mean value of carbon intensity is 0.44, while the median value is 0.07. This indicates that the mass of my data is concentrated on the right hand side of the frequency curve chart (i.e., the distribution is skewed). Because there is a large value (checked and it is not an outlier) of carbon intensity (carbon emission to sales ratio =17.3) and some 0 values, which may affect the mean value. To cope with this, I take natural logarithm of carbon intensity variable plus one (to maintain the same number of observations). The skewness decreases from 10.17 to 2.98. The mean value of the new variable is 0.25. Then I rerun the regression with respect to carbon intensity using Petersen two-way clustering approach, which provides similar results.

¹⁸ The descriptive statistics provided on Table 5.1 are appropriate, as the number of each variable is used in different regressions. For example, the sample size of regression model explaining Q ratio or productivity is more than 600, and the results with non-missing values are similar to the original ones and will be explained further under the results of Table 5.3. Although the number of carbon intensity is 169, it is only used in the carbon intensity regression and is not affected by other variables.

Table 5.2b: Pair-wise correlation matrix for testing H2

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Productivity	1.00						
2 S_{t-1}	0.24***	1.00					
3 G	0.19***	0.56***	1.00				
4 Size_emp	-0.38***	0.41***	0.28***	1.00			
5 ROS	0.13***	0.02	0.05	-0.21***	1.00		
6 Leverage	-0.14***	0.01	-0.12***	0.12***	0.01	1.00	
7 Capex	0.15***	0.04	0.06	-0.27***	0.28***	0.06	1.00

Notes: Productivity refers to employee productivity and is measured as natural logarithm of sales per employee ratio; S_{t-1} refers to one year lagged S score; G is defined as stakeholder sensitive governance disclosure; Size_emp denotes firm size measured as natural logarithm of employee number; ROS denotes the ratio of earnings before interest and taxes to net sales; Leverage is measured as the ratio of total debt to total assets; Capex is defined as the ratio of capital expenditures to net sales. *, **, *** indicates significance at the .10, .05, .01 levels respectively.

Table 5.2c: Pair-wise correlation matrix for testing H3

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Carbon intensity	1.00						
2 E_{t-1}	0.01	1.00					
3 G	0.07	0.53***	1.00				
4 Size_emp	-0.06	0.41***	0.30***	1.00			
5 ROS	0.12	0.00	0.02	-0.19***	1.00		
6 Leverage	0.07	0.03	-0.10*	0.16***	0.03	1.00	
7 Capex	0.05	0.14**	0.08	-0.26***	0.25***	0.03	1.00

Notes: Carbon intensity is measured as the ratio of carbon emission (scope 1 and scope 2) to sales; E_{t-1} refers to one year lagged E score; G is defined as stakeholder sensitive governance disclosure; Size_emp denotes firm size measured as natural logarithm of employee number; ROS denotes the ratio of earnings before interest and taxes to net sales; Leverage is measured as the ratio of total debt to total assets; Capex is defined as the ratio of capital expenditures to net sales. *, **, *** indicates significance at the .10, .05, .01 levels respectively.

5.4.2 Regression analysis

Table 5.3 displays the results of testing H1 (i.e., the link between ES/E/S score and market value).

Table 5.3: OLS regressions explaining market value (Equation 5-1)

	Predicted sign	Q ratio (Dependent variable)		
		ES	E	S
Intercept		5.59*** (8.16)	5.53*** (8.43)	5.79*** (9.50)
ES	+	0.01** (2.04)		
E	+		0.002 (0.50)	
S	+			0.01*** (3.03)
Size_sales	-	-0.31*** (-7.33)	-0.29*** (-7.20)	-0.32*** (-7.73)
ROA	+	5.01*** (3.72)	4.99*** (3.67)	5.05*** (3.89)
Leverage	-	-0.18 (-0.43)	-0.20 (-0.47)	-0.21 (-0.51)
Fin_acts	+/-	1.44** (2.27)	1.45** (2.31)	1.49** (2.27)
Str_holds	-	-0.10 (-0.30)	-0.11 (-0.33)	-0.18 (-0.55)
Analyst coverage	+	0.02** (2.09)	0.03*** (2.71)	0.02* (1.70)
Industry effect		Yes	Yes	Yes
Year effect		Yes	Yes	Yes
N		607	609	617
Clusters		231	232	233
R ²		51.22%	50.62%	52.15%
F-test		12.26***	11.99***	13.11***

*Notes: Q ratio is defined as total assets plus market value of equity minus book value of equity divided by total assets; ES denotes the sum of E and S scores; E denotes environmental disclosure; S denotes social disclosure; ROA is defined as the ratio of earnings before interest and taxes to total assets at the beginning of the year; Size_sales denotes firm size measured as natural logarithm of total sales; Leverage is measured as the ratio of total debt to total assets; Fin_acts denotes financial activities and is measured as the ratio of net proceeds from sale/issue of common and/or preferred stock during the year to total assets at the beginning of the year; Str_holds refers to strategic shareholdings and is measured as the percentage of total shares in issue held strategically and not available to ordinary shareholders (holdings of 5% or more are counted as strategic); Analyst coverage denotes number of analysts following firms' earnings; T-statistics are in parentheses. *, **, *** indicates significance at the .10, .05, .01 levels respectively. Standard errors are computed with procedure allowing for clustering across observations corresponding to the same firms for different years.*

As table 5.3 shown (results with respect to Equation 5-1), there is a positive and significant association between ES disclosure and a firm's Q ratio. This result suggests that firms which provide higher and better overall E and S information, help reduce information asymmetry between the firm and the investors thus reducing the perceived risk in these areas (Cormier et al., 2011) which is then reflected in higher market values for such firms. At a disaggregated level, similar results are generated for social disclosure, though not for E disclosures. In some ways, this finding is quite surprising, given the preponderance in literature on capital market implications of

environmental performance and environmental disclosures. The findings suggest that while the academia has focused more on environmental issues in CSR research, for investors it is the social performance and its subsequent disclosure that matters more. It seems that investors tend to place a relatively higher value on how firms address their social responsibilities particularly towards their employees. Anecdotal evidence indicates that prominent distributional conflicts between business and its stakeholders have been related to labour issues; well-known examples being Nike and Wal-Mart (see Heal, 2005 for further details). It appears that investors have now become sensitised to a business's key stakeholder particularly labour management practices and value higher a firm which better communicates its employee related practices.

The relations with respect to control variables in Table 5.3 are as expected and consistent with existing literature. There is a negative and significant relationship between firm size and Q ratio (Lo and Sheu, 2007 and Weir et al., 2002). ROA is positively and significantly related to Q ratio (Clarkson et al., 2011; Guenster et al., 2011). Financial activities variable is found to be positively and significantly linked with Q ratio, implying that firms which raise funds by issuing/selling stocks/bonds tend to have higher market values. Lang and Lundholm (1996) find that more disclosure leads to more analysts following. Consistent with Chung and Jo's (1996) finding that analyst coverage is an effective monitoring device, which reduces agency costs and increases the value of a firm, it is found that the level of analyst coverage is positively and significantly related to a firm's Q ratio.

It is worth noting that I also check the impact of missing observations on the results. First, I check the number of observations left with non-missing values. Second, I run a summary statistics and compare with the original descriptive table. Finally, re-run all regressions on Table 5.3 with non-missing values, and compare the results. The results show that there are 607 observations left with non-missing values. The summary statistics (e.g., mean values) are very closed to the original table. All results with non-missing values are similar to the results on Table 5.3. Therefore, the results are not affected by any missing values, and the descriptive statistics provided on Table 5.1 are reliable to carry out the above analysis.

Table 5.4 presents the results with respect to Equation 5-2 (i.e., H2: the association between S score and employee productivity) and Equation 5-3 (i.e., H3: the relation between E score and environmental eco-efficiency).

Table 5.4 OLS regressions explaining carbon intensity and employee productivity

	Predicted sign	Dependent variable	
		Carbon intensity(Eq5-4)	Productivity(Eq5-3)
Intercept		E_{t-1} 1.01 (0.69)	S_{t-1} 6.65*** (13.95)
E_{t-1}	-	-0.01* (-1.68)	
S_{t-1}			+ 0.01** (2.28)
G	-	-0.01 (-0.42)	+ 0.02*** (3.72)
Size_emp	+	-0.02 (-0.42)	- -0.28*** (-8.16)
ROS	+	0.45*** (3.05)	- -0.23*** (-2.66)
Leverage	+	-0.17 (-0.22)	- -0.18 (-0.88)
Capex	-	-0.04 (-0.20)	+ -0.69*** (-3.92)
Industry effect		Yes	Yes
N		148	384
R ²		18.08%	50.90%
F-test		6.21***	25.33***

*Notes: Productivity refers to employee productivity and is measured as natural logarithm of sales per employee ratio; Carbon intensity is measured as the ratio of carbon emission (scope 1 and scope 2) to sales; E_{t-1} and S_{t-1} refer to one year lagged E and S score respectively; G is defined as stakeholder sensitive governance disclosure; Size_emp denotes firm size measured as natural logarithm of employee number; ROS denotes the ratio of earnings before interest and taxes to net sales; Leverage is measured as the ratio of total debt to total assets; Capex is defined as the ratio of capital expenditures to net sales. T-statistics are in parentheses. *, **, *** indicates significance at the .10, .05, .01 levels respectively. Standard errors are computed using Petersen (2009) two-way clustering (firm and year) approach.*

With respect to the results of employee productivity (Equation 5-2), there is a positive and significant relation between lagged S score and employee productivity (support for H2). In other words, it implies that more employee related social disclosure (S score developed by Bloomberg is more employee related) increases a firm's trustworthiness among its key stakeholders particularly employees, which in turn is reflected in higher employee productivity. This finding is also consistent with economics based disclosure theory that more social disclosure in previous year reflects better social performance (captured by higher employee productivity) in the current year.

It is important to note that there is a positive and significant relation between governance and employee productivity, which implies that stakeholder sensitive governance matters for employee productivity. In other words, firms with stakeholder sensitive governance tend to care more about their employees (a key stakeholder). In turn, these firms can benefit from higher employee productivity. This finding is consistent with Heal (2005) and Waddock and Graves (1997) arguments that CSR programme can improve employee productivity, especially an enlightened employee relations policy may have a very low cost, but can lead to substantial gains in employee morale and productivity, hence yield a competitive advantage in comparison to less socially responsible firms. It is found that firm size is negatively and significantly linked with employee productivity, which is as found by Huselid (1995) as well as by Delmas and Pekovic (2012). ROS is negatively and significantly related to employee productivity, which is consistent with Huselid's (1995) argument that employee productivity is not synonymous with profitability, as well as consistent with Waddock and Graves's (1997) argument that social responsible firms may have higher implicit costs to other stakeholders such as employees, hence leads to lower profitability (but higher employee productivity). Huselid (1995) finds capital intensity (measured by the ratio of gross property, plant, and equipment over total employee number) is positively linked with productivity, while R&D expenditures (measured by the logarithm of the ratio of R&D expenditures to sales) are negatively associated with productivity. However, a negative link between capital expenditure and employee productivity is found. This finding may result from the denominator of capital expenditure variable (measured as the ratio of capital expenses to total sales instead of total employee number).

Regarding the results of carbon intensity (Equation 5-3), there is a negative and significant relation between lagged E score and carbon intensity (support of H3). This finding is consistent with economics based disclosure theory that more environmental disclosure in prior year can be a reflection of better environmental performance in current year. This result implies that firms providing more environmental related information in prior year are willing to show their commitment to be environmentally responsible by reducing their carbon emission in current year. Consistent with my expectation, ROS is positively and significantly linked with carbon intensity, which suggests that firms with higher sales tend to have higher

environmental impact (i.e., they emit more). It appears that carbon eco-efficiency is affected by industry. From the results (not reported), it can be seen that firms in Oil & Gas and Basic Materials industries emit more carbon (Scope 1 and Scope 2) compared to other industries. Thus it is not surprising that prior studies tend to focus on highly polluting firms, when examining environmental responsibility (Clarkson et al., 2008 and 2011).

5.5 Discussion and conclusions

To sum up, this study finds that higher overall environmental and social disclosures, but particularly social disclosures matter to investors. Investors appear to be placing a higher value on the firm seen to be behaving in a socially responsible manner. They can evaluate how well the firm is currently managing its environmental and social risks, and value such firm accordingly. More responsible behaviour in the social arena as reflected by its subsequent disclosure, helps mitigate the information asymmetry and hence the perceived social risks of the firm. Therefore, investors place higher values on such firms. Since the S score mostly covers aspects related to employee and human relations, this finding implies that while firms seem to care more about the environment (perhaps in anticipation of impending regulation), investors seem to value more how the firms treat their key stakeholders particularly the human resources. Furthermore, these results are consistent with the predictions of the voluntary disclosure theory (Verrecchia, 1983) and imply that despite being costs, firms are willing to provide relevant information voluntarily to the market, if the expected benefits of such disclosures are higher than the associated costs.

The findings of testing the link between social (environmental) disclosure and social (environmental) performance are consistent with the economics based disclosure theory. In other words, more social (environmental) disclosure in prior year reflects better social (environmental) performance captured by higher employee productivity (more carbon eco-efficiency) in the current year. Furthermore, more social disclosure helps build trust among a firm's key stakeholders particularly employees, which in turn would be reflected in higher employee productivity. This is also consistent with Siegel's (2009) argument that firms tend to use environmental or social related tactics (e.g., environmental or social disclosures) to align the interests between their shareholders and stakeholders. Thus firms can benefit from providing more

environmental or social disclosure in prior year. These findings are also consistent with stakeholder theory implying that firms with more stakeholder sensitivity care more about their employee related benefits or wellbeing, which could affect employee morale and productivity. In short, prior environmental and social disclosures can reflect a firm's current environmental (carbon eco-efficiency or less direct costs related to pollution/carbon emission trading) or social performance (employee productivity).

Prior studies tend to focus more on environmental aspect; this study adds significance to social disclosure. In other words, social disclosure plays as important role as environmental disclosure (perhaps more important). The preceding chapter provides some evidence that corporate governance (captured by the G variable) matters for a firm's environmental and social performance. In the next chapter, I will examine in detail the links between board attributes, CSR strategy and firms' environmental and social performance.

Chapter 6: Board attributes, CSR strategy and firms' environmental and social performance

6.1 Introduction

As mentioned in Chapter 2, the Companies Act 2006 sec. 172 stated that a director should consider wider range of stakeholders (e.g., employees, environment, customers, community and suppliers) to promote long-term business success. On the one hand, Kim and Nofsinger (2007) argue that from the stakeholder perspective, corporate governance is the mechanism that ensures corporations take responsibility for directing their activities in a manner fair to all stakeholders. On the other hand, from the broader conception of corporate governance (CG), Jamali et al. (2008) find that there is a clear overlap between CG and the stakeholder conception of CSR. Both CG and CSR call on companies to assume their fiduciary and moral responsibilities towards stakeholders. This act of accountability is crucial for a business to gain and retain the trust of its financial investors and other stakeholders (Page, 2005). Indeed, Jamali et al. (2008) conclude that there is a two-way relationship. CG and CSR should not be considered and sustained independently. CG is not entirely effective without a sustainable CSR drive, because a company has to meet various stakeholders' needs in order to create value for its shareholders. Recognizing the important role that boards play in addressing wider stakeholder responsibility, a few prior studies have addressed the effects of corporate governance (especially board attributes) on CSR (Johnson and Greening, 1999; Mallin and Michelon, 2011; Post et al., 2011). Recently, Mallin and Michelon (2011) investigate the relation between various board attributes and a firm's CSR performance, and find that board attributes such as board size, independence and diversity significantly affect a firm's CSR performance. Hence, from a strategic perspective, developing and implementing the appropriate CSR vision and strategy of firms is the function of corporate board (Ho, 2005; Mackenzie, 2007).

As shown in Figure 3.2, to date, prior studies drawing on the management perspective, particularly the resource-based view of the firm, have studied the link between a firm's managerial environmental strategy (though assumed to be unobserved or measured indirectly) and its environmental performance (e.g., Al-Tuwajri et al., 2004; Clarkson et al., 2011); or from a corporate governance

perspective (e.g., resource dependency theory) have studied the link between a firm's board attributes and corporate social performance (Johnson and Greening, 1999; Mallin and Michelon, 2011). However, prior literature on CSR from both management and corporate governance perspectives has tended to suffer from conceptual as well as methodological limitations.

As discussed extensively in Chapter 3 section 3.3.3, studies drawing on the management literature hypothesise that superior managerial capabilities and superior CSR strategy translate into superior CSR performance. However, neither of these two explanatory variables is explicitly accounted for in the research design. As also discussed extensively in Chapter 3 section 3.3.1 and 3.3.2, studies from the corporate governance perspective, while acknowledging the strategy setting and advisory role of the board (e.g., Mallin and Michelon, 2011), neither explicitly consider the strategic actions of the board in this regard, nor control for the possible endogeneity of the link between board attributes and CSR performance (as is implied by Hermalin and Weisbach's 2003 model). Hence, to date, no prior study takes a more integrated approach and examines the link between a firm's board attributes, its CSR strategy and its environmental and social performance.

In this chapter, using a sample of UK firms included in the FTSE All-Share Index from 2002 to 2010, I investigate the relations among board attributes, CSR strategy and firm environmental and social performance. Using an aggregated measure of CSR strategy and a latent construct capturing board level CSR orientation, I also examine the possible endogenous link between board attributes, board CSR strategy and firm environmental and social performance.

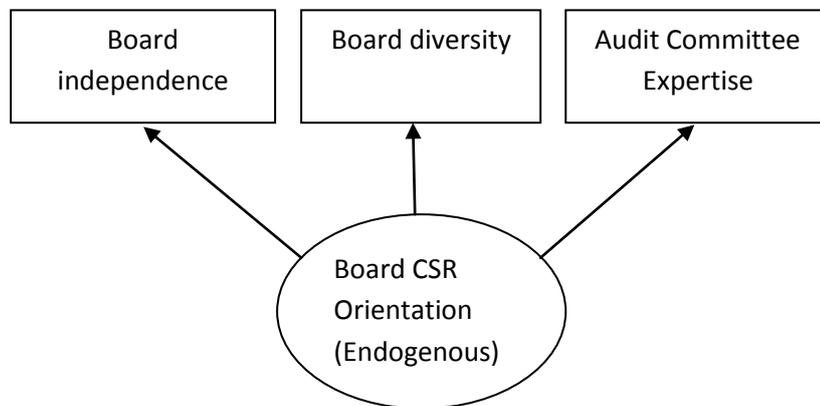
This study thus improves on prior literature both conceptually and methodologically. Drawing upon two largely independent streams of literature in the field of CSR, namely corporate governance literature and CSR as a competitive strategy literature, the findings suggest that in order to develop a more complete understanding of firms' CSR performance drivers, it is important to integrate the two streams in such types of analyses. Methodologically, it incorporates the influences of both board level CSR orientation and strategy on firms' environmental and social performance; explicitly measures CSR strategy; and uses structural equation modelling technique to test whether this link is endogenous.

6.2 Theoretical model and hypotheses development

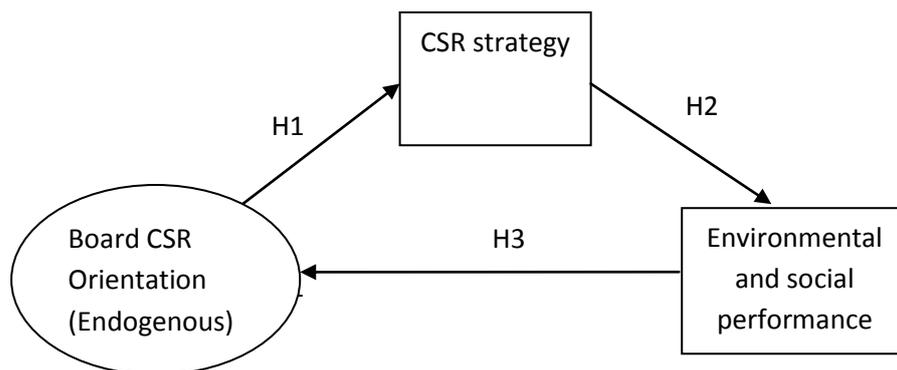
As reviewed in Section 3.3.4, Hermalin and Weisbach (2003) argue that the board of directors of a company is an endogenously determined institution. It implies that the choice of directors on a board would be a within-equilibrium phenomenon determined by the company's own characteristics including its (CSR related) strategies and financial/non-financial performance (such as CSR performance). Hence, adapted from Hermalin and Weisbach (2003) theoretical model, Figure 6.1 displays the adapted theoretical model and relevant hypotheses.

Figure 6.1: The structural equation model on boards of directors

Measurement model:



Structural model:



Adapted from Hermalin and Weisbach (2003)

As Figure 6.1 illustrates, the relation between CSR-related board characteristics and CSR performance is not only likely to be endogenous, but is likely to be mediated by appropriate CSR strategy such as taking the decisions and actions like putting in place a CSR committee.

While the literature review in sections 3.3.1, 3.3.2 and 3.3.3 respectively makes clear the direction and nature of the causal links expected between board CSR attributes, CSR strategy and firm environmental and social performance, it does not clarify how CSR performance may affect board CSR attributes. In this regard, while consistent with the empirical and theoretical work of Hermalin and Weisbach (1998, 2003), it can be argued that performance could also affect board attributes. However, no prediction is made (either positive or negative) regarding the nature of this relation. One can argue that if poor CSR performance leads to addition of CSR-conducive board members (in response to say stakeholder pressure, consistent with legitimacy theory based arguments), then the link would be negative. For example, appoint more independent and/or women directors who are able to bring in precious resources to enhance the organisational legitimacy. If however, it is the case that superior CSR performers want to further build on this competitive advantage, as suggested by RBV theory, then they would respond to superior CSR performance, by further strengthening the board level CSR orientation. In this case, the link would be positive. Thus it can be an open empirical question.

In addition, drawing upon prior empirical evidence, I use three board characteristics that have been found to have a significant link with a firm's CSR performance namely: board independence (proportion of outside directors), gender diversity and audit committee expertise, to capture board level CSR orientation (i.e., a latent variable). Based on above theoretical model and prior empirical evidence (as reviewed in Chapter 3 sections 3.3.1, 3.3.2 and section 3.3.3), three hypotheses are developed as follows:

H1: Board CSR orientation is positively associated with CSR strategy.

H2: CSR strategy is positively associated with a firm's environmental and social performance.

H3: Both a firm's environmental performance and social performance are positively (negatively) associated with board CSR orientation.

6.3 Variables and models

6.3.1 Endogenous variables

Board CSR orientation

To capture the latent construct, board's CSR orientation, I use three board attributes as indicators, namely board independence (i.e., proportion of outside director representation on board); board gender diversity; and financial expertise on audit committee. Below I discuss the rationale for inclusion of each of these variables.

Board independence: According to Agency theory, to reduce opportunism and agency costs, boards should consist of a greater proportion of outside directors (i.e., be more independent). With a greater proportion of outsiders, a board is likely to be more independent and has greater monitoring potential (Fama and Jensen, 1983). Outside directors can monitor the behaviour of managers and intervene when managers behave opportunistically (Post et al., 2011). For example, inside directors may tend to be more attentive than outsiders to short-term economic performance goals, while outsiders may consider that attending to the environmental issue is also important for the long-term interest of shareholders (Johnson and Greening, 1999). Moreover, board independence might be important in governing climate change because independence would be expected to inject new insights and perspectives related to environmental and social stakeholders, while challenging existing mental models in decision making that may be focused exclusively on the economic bottom line (Galbreath, 2010). The 2010 Code section B.1.2 recommends that large UK listed firms should have at least half of the board composed of independent NEDs. According to the Code, a director considered to be independent, he/she should have not previously been an employee of the company (within the last five years); have no family or business link with the company; do not hold any cross directorship; should not represent any significant shareholder; should not receive additional remuneration from the company apart from a director's fee; and should not have been on the Board for more than nine years.

From a resource dependency theory perspective, Pfeffer and Salancik (1978) suggest that the selection of a greater number of independent directors signals a firm's intent to pay greater attention to its external environment and legitimacy.

According to their resource dependence framework, independent directors attract valuable resources to a firm's viability in terms of establishing external links with stakeholders and other organisations and enhancing the reputation of the firm. Furthermore, the presence of independent directors on the board should increase the board's objectivity and its ability to represent multiple points of view about firms' environment and among stakeholders. Wang and Dewhirst (1992) find outside directors are likely to have a stakeholder orientation. In addition, Mallin and Michelon (2011) consider outsider directors to be boundary spanners who can attract valuable resources to a firm as well as help a firm establish external links with stakeholders and other organisations. Thus independent directors are more conscious of stakeholders' expectation. Based on the discussed evidence, it can be argued that the more independent a board, the more CSR oriented it is likely to be. Asset4 the database used in this study measures board independence by the percentage of independent board members as reported by a company.

Board diversity: There is a growing societal as well as regulatory pressure (see Financial Reporting Council, 2011) on companies to become more diverse and inclusive. According to a study by Sealy and Vinnicombe (2012) women directors made up 11.2% of executive and 33.8% of non-executive directors on FTSE 350 companies in 2012. In terms of the stakeholder-related values and competencies that women bring on board, a study by Singh et al. (2006) finds that women are more likely to possess business as well as community related expertise. Furthermore, a study by Kramer et al. (2006) finds that the presence of women on boards tends to broaden the content of boardroom discussion to include the perspectives of multiple stakeholders. A recent comprehensive literature review of women on corporate boards also draws the conclusion that most research on the role of women on boards is focused around their potential role in building fairer and more inclusive business institutions that reflect the expectations of present generation of stakeholders (Terjesen et al., 2009). Nielsen and Huse (2010) draw upon theories of gender differences and group effectiveness to examine the contribution of women on boards of directors. Their findings suggest that women tend to accept others' positions, support and sooth others and contribute to relational and interpersonal problems. The Financial Reporting Council (2011) consultation document on gender diversity also echoes the expectation that women on boards may help companies

build better relationship with its key stakeholders like customers and employees. Hence, it is expected that the greater the proportion of women on board, the higher a board's CSR orientation. Asset4 measures board diversity as percentage of women on the board of directors.

Financial expertise on audit committee: The UK Combined Code (2003), consistent with the recommendations of the Sarbanes Oxley Act (2002) in the US (which is used by Asset4 for measuring audit committee expertise), suggests that at least some members of audit committees should have adequate knowledge of finance and financial matters. Audit committees are responsible for internal control and for managing both the financial and non-financial risks faced by a firm. As environmental risks can have significant financial implications in the form of environmental fines as well as potential cash outlays for pollution control and for investments in environmentally friendly technologies (Freedman and Patten, 2004), audit committees with members having financial expertise are likely to be better equipped for developing policies and strategies that can help avoid and manage these risks. In this regard, Goodstein and Boeker (1991) state the specific and unique individual competencies of board directors contribute differently to the board process and priorities; thus motivate management to adopt specific strategies and actions. According to resource dependence theory (Hillman and Dalziel, 2003; Pfeffer and Salancik, 1978), board directors with financial expertise on audit committees can play an effective service role as advisors, boundary spanners, as well as resource providers. As advisors and boundary spanners, they can help a firm better assess its CSR risks and challenges, and help develop an effective strategic response such as encouraging compliance with GRI guidelines. As resource providers, they can help a firm develop links with external organisations like external environmental audit agencies, and encourage a firm to opt for the decision to get an external audit of its CSR report. Research shows that external audit of CSR report is valued highly by investors (Lee and Hutchison, 2005). Asset4 measures audit committee expertise as a dummy variable with a score 1 if a firm has an audit committee with at least three members, one of whom is considered as a "financial expert" within the meaning of Sarbanes-Oxley, and 0 otherwise.

CSR Strategy

Relatively little research has specifically identified variables that could capture a firm's strategic stance towards its CSR-related responsibilities. A notable exception is the study by Galbreath (2010) who uses five categories of the California Environmental Resources Evaluation System (CERES) to demonstrate a firm's proactive posture towards climate change. Asset4 develops an index for capturing a firm's board level CSR policy and strategy based on measures that are closely aligned with those used by Galbreath (2010). These variables are: 1) integration by a firm of its financial and extra-financial reporting; 2) decision to report or otherwise on the firm's CSR-related global activities; 3) existence or otherwise of a board CSR committee; 4) decision to have an external audit of CSR report; 5) decision to comply with GRI guidelines. How these variables contribute to an effective CSR strategy is discussed below.

a) Integration of financial and extra-financial reporting; and b) CSR global activities reporting: In terms of the relevance for a firm's CSR strategy, the above two variables can be considered to be an attempt on the part of the firm to commit to providing relevant and timely voluntary disclosure about its extra-financial activities including environmental and social challenges they face globally. As studies suggest (e.g., Cormier et al., 2011), such disclosures help reduce information asymmetry between a firm and its investors; thus build trust and reduce perceived firm risk.

Corporate governance is also intimately concerned with honesty and transparency, which are increasingly expected of the public both in corporate dealings and disclosure (Page, 2005). Investor confidence and market efficiency depend on the disclosure of credible information about a firm's financial and extra-financial performance. OECD 2004 principles propose CG framework to 'promote transparent and efficient market' and to 'provide timely and accurate disclosure'. It is voluntary for a firm to provide extra-financial information, for example, openly reporting about the challenges or opportunities of integrating financial and non-financial issues and disclosure of global activities in the extra-financial reports. From economic based voluntary disclosure theory, the more extra-financial reporting (in terms of challenges and opportunities and global activities) a firm provides, the more inclined it would be

towards stakeholder engagement and the better environmental or social performer it likely to be.

Existence of CSR committee: Having a separate CSR committee not only indicates a public recognition of the importance of environmental and social responsibilities for the firm at the top, but also demonstrates the putting in place of human resources and organisational structures, for providing effective planning and oversight in this area. According to Mackenzie (2007), the key activities of CSR committees are discussing issues and risks, setting standards, reviewing implementation and disclosure, and philanthropy (e.g., reviewing CSR issues, identifying non-financial risks and monitoring risk management, establishing policies and standards, monitoring compliance with the performance against companies CSR policies, reviewing company reporting on CSR, overseeing philanthropic activity, reviewing company's adoption of external codes and inclusion in CSR indices such as FTSE4Good, and looking at management implementation plans and targets). Overall, Mackenzie (2007) states that CSR committees play an important role in assisting the management in CSR strategy formulation and in reviewing the firm's CSR performance.

External audit of CSR report: The decision to have the CSR report externally audited demonstrates a further commitment on the part of the firm to building trust with its stakeholders. "*The objective of the verification is to provide an opinion to stakeholders on the accuracy and reliability of selected KPI data presented in the report*" (The Go-Ahead Group Plc, Corporate Responsibility Report 2010, p.22). Furthermore, Cooper and Owen (2007) analyze 12 corporate sustainability reports and find that assurance providers make specific reference to carrying out their work in relation to the AA1000 Assurance Standard that has a profound stakeholder orientation. Research shows that external audit of CSR report is valued highly by investors. For example, Lee and Hutchison (2005) suggest that for gaining credibility, investors demand CSR disclosures of firms to be externally audited. Hence, the decision to have an external audit of CSR report is a good indicator of a firm's commitment to its CSR responsibility and represents a strategic choice by some firms.

GRI compliance: According to Henriques (2010), GRI reporting guidelines have been developed by a multi-stakeholder process, which gives it a high degree of legitimacy, and set out the most highly regarded and widely used set of environmental and social indicators. The decision of companies to adhere to GRI guidelines suggests a commitment to standardisation of their CSR reporting. In this context, Clarkson et al. (2008) note the importance of compliance with GRI guidelines in CSR reporting, if firms are to gain credibility among its various stakeholders. Hence, choosing to voluntarily comply with GRI compliance is a strategic choice made by firms. By complying with GRI guidelines, firms demonstrate their commitment to their stakeholder responsibility (i.e., take their stakeholder responsibility seriously).

A firm's CSR strategy is captured by the aggregated strategy score as described above. It is reasonable to argue that the more of these strategy and policy measures that a firm adopts, the more proactive and comprehensive (in terms of internal capacities and external reputation building measures) is its CSR strategy. The CSR strategy score ranges from 1 to 100 showing how a firm performs compared to the entire Asset4 universe based on the value in the related indicator. In other words, the score is normalized using Z-score, equally weighted and benchmarked against the complete universe of 4000 companies in the Asset4 database. According to Asset4, the aggregated vision and strategy score

“Measures a company’s commitment and effectiveness towards the creation of an overarching vision and strategy integrating financial and extra-financial aspects. It reflects a company’s capacity to convincingly show and communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes” (Asset4 definition).

Hence, the higher a firm's aggregated vision and strategy score, the more integrated and comprehensive its CSR strategy. Table 6.1 shows the definitions and pair-wise correlation of CSR strategy variables.

Table 6.1 CSR vision and strategy (Definitions and pair-wise correlation matrix)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
1 Integration of financial and extra-financial reporting	1.00					
2 CSR committee	0.35	1.00				
3 GRI compliance	0.19	0.21	1.00			
4 CSR global activities reporting	0.40	0.49	0.17	1.00		
5 CSR report external audit	0.31	0.37	0.41	0.46	1.00	
6 Vision and strategy	0.37	0.56	0.48	0.54	0.55	1.00

Notes: Integration of financial and extra-financial reporting (Yes/No): Is the company openly reporting about the challenges or opportunities of integrating financial and extra-financial issues, and the dilemmas and trade-offs it faces? CSR Committee (Yes/No): Does the company have a CSR committee or team? GRI compliance (Yes/No): Does the company compliance with the Global Reporting Initiative guidelines? CSR global activities reporting (Yes/No): Does the company's extra-financial reporting take into account the global activities of the company? CSR report external audit (Yes/No): Does the company have an external auditor of its CSR/H&S/Sustainability report? Vision and strategy score measures a company's commitment and effectiveness towards the creation of an overarching vision and strategy integrating financial and extra-financial aspects. It reflects a company's capacity to convincingly show and communicate that integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes.

Environmental and Social Performance Scores

ESP scores are described in Chapter 3 section 2.5.4.

6.3.2 Exogenous regressors and control variables

A number of exogenous regressors and control variables are defined as follows; *Firm size*: natural logarithm of net sales; *Profitability* measured by return on equity: ratio of net income before preferred dividends minus preferred dividend requirement to the average of last year's and current year's common equity; *Capital expenditure*: ratio of capital expenditures to net sales; *Strategic shareholdings*: percentage of total shares in issue held strategically and not available to ordinary shareholders, and only holdings of 5% or more are counted as strategic; *Slack*: natural logarithm of the sum of cash and short-term investments and total receivables; *Leverage*: ratio of total debt to total assets; *Board duality* (dummy variable): 1 if the CEO simultaneously chairs the board; 0 otherwise.

6.3.3 Models tested

To investigate whether board of directors is an endogenously determined institution, structural equation modelling (SEM) technique is adopted. The following structural equation model tests hypotheses 1, 2 and 3 simultaneously.

$$\text{CSR strategy} = \text{Board CSR orientation} + \text{Slack} + \text{Leverage} + e \quad (6-1)$$

$$\begin{aligned} \text{Environmental or social performance} = & \text{CSR strategy} + \text{Firm size} + \text{Profitability} \\ & + \text{Capital expenditure} + \text{Strategic shareholdings} + [\text{Industry dummies}] + [\text{Year} \\ & \text{dummies}] + e \end{aligned} \quad (6-2)$$

$$\begin{aligned} \text{Board CSR orientation} = & \text{Environmental or social performance} + \text{Firm size} + \\ & \text{Strategic shareholdings} + \text{Board duality} + e \end{aligned} \quad (6-3)$$

To carry out this analysis, I use SEM procedure incorporated in Stata12. SEM¹⁹ is covariance-based (linear model), which only applies to continuous endogenous variables. This technique provides for use of latent (unobserved) constructs; for dependent variables that simultaneously affect each other; and supports correlations of errors including autocorrelation in panel data. Accordingly, this modelling tool is used in above regression analysis, and standard errors are clustered at firm level to account for panel structure of the data (specifically, possible non-independence of observations corresponding to the same firms over years).

Board CSR orientation is a latent variable measured by three board attributes variables, namely board independence, board diversity and audit committee expertise. Other than the endogenous variables, control variables used in each equation are based largely on prior related empirical evidence. It is necessary to note that to show the direction of expected relation with the dependent variable, in the following discussion, I provide the predicted sign for each control variable in brackets. In Equation (6-1), CSR strategy is likely to be affected not just by board CSR orientation (i.e., inclination), but also the availability of slack resources (positive, based on the argument made by Clarkson et al. (2011) that firms pursuing a proactive environmental strategy are most likely the ones with greater financial resources), and, level of financial flexibility available i.e., leverage (negative, based on Clarkson et al., 2011). In Equation (6-2), I model environmental and social performance. Following Ioannou and Serafeim (2012) who investigate the determinants of environmental and social performance in a cross-country setting, I also control for: firm size (positive); profitability (positive); and strategic shareholdings (negative). Following Clarkson et al. (2011), capital expenditure

¹⁹ The key advantages of the 'sem' command from Stata 12 are: 1) it is easy to obtain standard errors, confidence intervals, and associated tests that are robust to lack of independence within identified groups of observations (e.g., vce(cluster group)); 2) it can be used when the data are unbalanced - mlmv (i.e., there is a different number of observations for dependent variables). In other words, when there are missing values for dependent variable (so long as they are missing on observables), one can still use the information on the other variables.

(positive) is also controlled for. In this equation, industry and year dummies are included. In Equation (6-3), in addition to environmental and social performance, it is expected that board CSR orientation is affected by: firm size (positive), as larger firms are known to be more under the public eye and hence may face greater stakeholder pressures, thus more likely to have board members with CSR orientation; strategic shareholdings (negative), as equity holders are more likely to be shareholder centric thus less inclined to have board members with CSR orientation; and CEO duality (negative). One individual performing as both chairman and CEO may constrain board independence that may reduce the overall accountability of the firm and affect fair decision-making. For example, Shivdasani and Yermack (1999) find that when two positions are combined, fewer independent non-executives are appointed. Furthermore, Galbreath (2010) finds that firms which split the CEO-chairman role demonstrate higher performance of their governance practices regarding climate change e.g., board oversight dimension.

6.4 Sample and data

The sample is the intersection of the Asset4 and Datastream universe of UK listed companies, covering the period 2002-2010. The intersection of these data sets yields a usable sample of 2028 firm-year observations. This is mainly due to the limited coverage by Asset4. Industries are classified by using the FTSE/DJ single-digit Industry Classification Benchmark (ICB) March 2008 version. This leads to 10 industry groups including financials in the sample. Financials include banks, insurances, real estate and financial services. Table 6.2 gives the break-up of industries covered in the sample for each year.

Table 6.2 Number of sample companies in each sector and each year

Industry Code	Industry	02	03	04	05	06	07	08	09	10	Total	Percent
0001	Oil & gas	4	4	12	13	13	14	14	18	19	111	5.47
1000	Basic materials	2	2	14	14	15	18	22	22	22	131	6.46
2000	Industrials	18	18	53	65	66	67	67	71	67	492	24.26
3000	Consumer goods	9	9	17	22	23	23	23	27	26	179	8.83
4000	Health care	3	3	4	5	5	5	5	9	9	48	2.37
5000	Consumer services	21	22	46	54	57	59	59	64	62	444	21.89
6000	Telecommunications	2	2	3	5	5	5	5	5	6	38	1.87
7000	Utilities	6	6	7	8	8	8	8	8	7	66	3.25
8000	Financials	18	19	49	54	54	60	60	63	60	437	21.55
9000	Technology	2	2	6	10	10	10	10	16	16	82	4.04
Total		85	87	211	250	256	269	273	303	294	2028	100.00

As Table 6.2 shows general industrials, consumer services and Financials account for the bulk of companies in the sample. The sample represents a wide range of industries. The number of firms in each industry sector appears to increase over time, apart from the years between 2009 and 2010 (i.e., the number of firms in some sectors drops slightly).

A unique dataset Asset4 with environmental, social and governance (ESG) scores and components is used. The G score of Asset4 provides details of each board attributes and CSR strategy related variable.

6.5 Results

6.5.1 Descriptive and correlation statistics

Table 6.3 reports the descriptive statistics for all variables used in the analyses.

Table 6.3 Descriptive statistics

Variable	Mean	S.D.	Min	Max
Environmental performance	59.21	27.46	9.54	97.17
Social performance	63.40	25.97	4.18	98.82
Board independence	51.54	14.23	0	100
Board diversity	7.57	9.04	0	62.5
Audit committee expertise	0.65	0.48	0	1
Board duality	0.04	0.19	0	1
CSR strategy	62.03	29.64	9.51	98.61
Firm size	14.05	1.67	7.45	19.33
Profitability (return on equity)	0.25	1.58	-9.04	58.80
Leverage	0.20	0.18	0	0.88
Capital expenditure	0.15	0.52	0	15.56
Strategic shareholdings	0.26	0.21	0	0.91
Slack	12.76	1.55	7.44	18.78

Note: All variables are as defined in the "Variables and Models" section.

As Table 6.3 shows, the mean values of environmental and social performance scores are 59% and 63% respectively. About 52% of the board members of an average firm are independent, while about 4% of the firms have the same person as CEO and Chairman (i.e., duality). On average about 8% of board members are women. 65% of audit committees have relevant expertise (i.e., with at least one member being considered a "financial expert" within the meaning of Sarbanes-Oxley given his or her extensive experience in accounting and auditing matters). The mean

value of CSR strategy score (i.e., normalized Z-score) is 62. The average firm size measured as natural logarithm of net sales is 14.05, which is equivalent to sales value of 1.3 billion GBP. The mean values of profitability, leverage, capital expenditure and strategic shareholdings are 25%, 20%, 15%, and 26% respectively. The average slack resources available in a firm are 348 million GBP. Of note, the number of observations for each variable varies slightly based on the availability of data for the variable. Table 6.4 displays the pair-wise correlations for all variables. Although firm size is highly correlated with slack (0.80), they are not included in the same regression i.e., Equation (6-1). Table 6.4 shows a high correlation between environmental performance and social performance (0.72), which is consistent with Brammer et al.'s (2006) finding that there is a high degree of association within corporate social rating scores of the same category of EIRIS data; especially the overall score is highly correlated with the environmental and social score respectively. Given the relatively moderate levels of correlations among other variables, multi-collinearity is not likely to be a problem for the analyses.

Table 6.4 Pair-wise correlation matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1 Environmental performance	1.00												
2 Social performance	0.72***	1.00											
3 Board independence	0.27***	0.32***	1.00										
4 Board diversity	0.22***	0.25***	0.18***	1.00									
5 Audit committee expertise	0.17***	0.15***	0.27***	0.14***	1.00								
6 Board duality	-0.11***	-0.11***	-0.13***	0.02	-0.01	1.00							
7 CSR strategy	0.69***	0.67***	0.28***	0.21***	0.14***	-0.12***	1.00						
8 Firm size	0.51***	0.56***	0.31***	0.22***	0.10***	-0.08***	0.48***	1.00					
9 Profitability	-0.02	-0.02	0.02	-0.02	0.05*	-0.01	0.00	-0.01	1.00				
10 Leverage	-0.01	-0.05*	-0.02	-0.11***	-0.01	0.04†	-0.02	-0.07**	0.03	1.00			
11 Capital expenditure	-0.01	-0.09***	0.00	0.01	0.00	-0.02	0.03	-0.28***	-0.02	0.05*	1.00		
12 Strategic shareholdings	-0.24***	-0.24***	-0.26***	-0.18***	-0.32***	0.11***	-0.18***	-0.20***	0.00	0.03	0.02	1.00	
13 Slack	0.41***	0.46***	0.32***	0.14***	0.11***	-0.07**	0.42***	0.80***	-0.02	-0.06*	-0.14***	-0.16***	1.00

Note: All variables are as defined in the “Variables and Models” section. † p .10, * p .05, ** p .01, *** p .001.

are statistically significant and have correct signs. The standardized loadings reported in Table 6.5 also illustrate that while the relative importance of gender diversity and audit committee expertise are very similar, board independence loads a bit more heavily on the latent construct, board CSR orientation.

The results of structural equation modelling in Table 6.5 support all of the three hypotheses (i.e., H1, H2 and H3). Specifically, it is found that boards which are more CSR oriented tend to show greater commitment to CSR by developing a more integrated CSR strategy, which in turn allows them to achieve superior environmental performance. Moreover, superior environmental performers also tend to choose more CSR-conducive board attributes. Hence, the findings suggest the existence of a cyclical link among a firm's board CSR orientation, CSR strategy, and its environmental performance.

The aforementioned relationships are not only statistically significant, but also economically meaningful. In particular, one standard deviation increase in board CSR orientation leads to an increase of CSR strategy by 0.34 of the respective standard deviation ($\beta = .34$, $p < .001$). One standard deviation increase in CSR strategy boosts environmental performance by 0.51 of the respective standard deviation ($\beta = .51$, $p < .001$). Finally, one standard deviation increase in environmental performance enhances board CSR orientation to somewhat smaller extent, i.e., by 0.15 of the respective standard deviation ($\beta = .15$, $p < .05$).

The results with respect to control variables in Table 6.5 are as expected. Consistent with Clarkson et al.'s (2011) finding that only firms with sufficient financial resources can pursue a proactive environmental strategy, a positive and significant relation is also found between financial slack and CSR strategy ($\beta = .28$, $p < .001$). Moreover, consistent with prior literature (Ioannou and Serafeim, 2012), firm size is positively linked with environmental performance ($\beta = .28$, $p < .001$) and board CSR orientation ($\beta = .38$, $p < .001$). This indicates that larger firms being more visible to the public face greater pressure from a variety of external stakeholders (Deegan, 2002; Patten, 2002b). Thus larger firms may be driven to do better in environmental performance as well as board CSR orientation. Consistent with prior related literature (Ioannou and Serafeim, 2012), strategic shareholdings is found to be negatively related to environmental performance ($\beta = -.12$, $p < .001$) and board CSR orientation ($\beta = -.44$,

$p < .001$), suggesting that large shareholders in a firm tend to be more interested in shareholder, and less interested in other stakeholder interests. Contrary to my expectations but consistent with the findings of Mallin and Michelon (2011), there is no link between firm profitability (i.e., ROE) and E performance. Capital expenditure consistent with previous findings (Clarkson et al., 2011) is positively linked with environmental performance ($\beta = .07$, $p < .01$), suggesting that in general firms are now investing in environmentally friendly technologies. Prior studies indicate that environmental responsibility is influenced by the nature of business activities, particularly by industry sectors most closely associated with environmental concerns (Brammer and Pavelin, 2008). It is also found that firms in consumer goods industry tend to do better in environmental aspect (as also found by Mallin and Michelon, 2011), while firms in oil and gas industry and consumer services sector tend to be poorer environmental performers.

Overall, the findings are consistent with Hermalin and Weisbach's (2003) argument that the board of directors of a firm is an endogenously determined institution. A firm's CSR performance is determined by its CSR vision and strategy which is influenced by board level CSR orientation. Prior studies treating the link between board attributes and CSR performance as an out-of-equilibrium phenomenon provide a misleading interpretation of this relation. In fact, it can also be the other way relation, that is, a firm's environmental performance affects its board CSR orientation.

Table 6.6 reports the results of structural equation modelling with respect to social performance. Overall, the results are very similar to those in Table 6.5. Notable exception is that the coefficient on capital expenditure is not significant, indicating that capital expenditure does not affect a firm's social performance. This is quite reasonable, given that better social performance is likely to be less financial capital sensitive, but more human relational capital sensitive. Interestingly, it is found that the coefficients on consumer goods and consumer services industries turn to be insignificant. However, the coefficient on oil and gas industry remains negative and significant. Overall, the differences in findings with respect to environmental and social performance are in line with Cormier et al.'s (2011) suggestion that it is important to distinguish environmental performance from social performance in CSR related studies.

Table 6.6 Results of structural equation model with respect to social performance (Standardized coefficients reported)

Independent variable	Structural model:		
	Dependent variable (Structural)		
	CSR strategy	Social performance	Board CSR orientation
Board CSR orientation	0.32*** (3.73)		
CSR strategy		0.48*** (12.75)	
Social performance			0.19** (2.55)
Firm size		0.31*** (9.30)	0.35*** (4.04)
Strategic shareholdings		-0.15*** (-5.41)	-0.44*** (-7.69)
Return on equity		-0.01 (-0.53)	
Capital expenditure		-0.00 (-0.01)	
Slack	0.29*** (3.68)		
Leverage	0.03 (0.73)		
Board duality			-0.05 (-0.58)
Oil and gas		-0.06** (-2.62)	
Basic materials		-0.04 (-1.35)	
Industrials		0.03 (0.89)	
Consumer goods		0.04 (1.25)	
Health care		0.01 (0.39)	
Consumer services		-0.01 (-0.32)	
Telecommunications		0.01 (0.37)	
Utilities		0.00 (0.18)	
Technology		0.04 (1.27)	
Year fixed effects		Yes	
Intercept	-1.10*** (-3.48)	-0.68* (-2.33)	
	Measurement model:		
	Board independence	Board diversity	Audit committee expertise
Board CSR orientation	0.53*** (9.76)	0.37*** (8.20)	0.38*** (7.13)
Intercept	2.08*** (4.64)	-0.24 (-0.69)	0.27 (1.42)
	Model summary:		
Observations	2028		
Clusters	308		
Overall R-squared	62.33%		

Notes: †p .10, *p .05, **p .01, ***p .001. Z-statistics are in parentheses. Standard errors are clustered at firm level. All variables are defined in the "Variables and Models" section.

Table 6.7 provides a summary of the standardized results with respect to E and S performance respectively.

Table 6.7 Summary of structural equation modelling results (Standardized coefficients reported)

Research hypothesis	Predicted sign	Path coefficients		Final result
		Environmental performance	Social performance	
H ₁ : Board CSR orientation -> CSR strategy	+	0.34*** (3.91)	0.32*** (3.73)	Supported
H ₂ : CSR strategy -> Environmental or social performance	+	0.51*** (13.12)	0.48*** (12.75)	Supported
H ₃ : Environmental or social performance -> Board CSR orientation	+/-	0.15* (2.06)	0.19** (2.55)	Supported

Notes: †p .10, *p .05, **p .01, ***p .001. Z-statistics are in parentheses.

6.6 Sensitivity analyses

6.6.1 Size effect and FTSE 100 dummy

To test the robustness of the above results, a number of sensitivity tests are carried out. It is argued in the literature that environmental and social responsibility is mainly driven by firm size (Brammer and Pavelin, 2008). Hence, an alternative size measure, namely the natural log of total assets is used in all regressions, which provides results similar to those reported. Furthermore, it can also be argued that CSR strategy and performance is a concern for only the largest firms. Therefore, FTSE 100 dummy variable is added as a determinant of CSR strategy and/or environmental and social performance regression (i.e., Equation (6-1) and/or (6-2) in the structural equation model). While the coefficients on FTSE 100 dummy are significant in all cases, the other results remain unchanged.

6.6.2 Analysis using alternative CSR strategy and environmental and social measures

It can be argued that the results may be sensitive to a self-reporting or source bias, as the same database for the environment, social, and governance variables is used in the analysis. Hence, validity and reliability checks are conducted for above results, using two further data sources, namely hand collected CSR strategy variable and Bloomberg environmental and social scores. First, aggregated CSR strategy variable from Asset4 is replaced by a CSR strategy variable for 2009. This is based on hand-collected data for FTSE 350 non-financial companies in 2009. The aggregated score is the sum of eight components (all dummy variables derived from Clarkson et al.'s

(2008) framework): existence of CSR committee, executive remuneration linked pay policy, external audit of CSR report, use of technology or innovation to improve CSR performance, participation with non-governmental organisations (NGOs) or other industries to improve CSR performance, internal audit of CSR report, environmental awards, and CSR policy statement. Content analysis approach is used to codify companies' voluntary reporting in these areas, using their sustainability reports and/or websites information which is publicly available. If a company provides information about any component, then it will be scored 1; and 0 otherwise. It is worth mentioning that due to time constraint, the hand-collected data is only available for year 2009. Table 6.8 reports the summary of the standardized results, replacing the Asset4 CSR strategy variable with hand developed CSR strategy variable. As Table 6.8 shows, the results remain largely similar to the main results in Table 6.7.

Table 6.8 Results of alternative measure of CSR strategy (Standardized coefficients reported)

Research hypothesis	Predicted sign	Path coefficients		Final result
		Environmental performance	Social performance	
H ₁ : Board CSR orientation -> CSR strategy	+	0.39*** (3.79)	0.30** (2.82)	Supported
H ₂ : CSR strategy -> Environmental or social performance	+	0.47*** (5.48)	0.30** (3.02)	Supported
H ₃ : Environmental or social performance -> Board CSR orientation	+/-	0.11 (0.84)	0.39*** (3.27)	Partially supported

*Note: CSR strategy variable is measured as the sum of eight components (dummy variables) collected manually from companies' CSR reports and/or websites in 2009. Z-statistics are in parentheses. Standard errors are clustered at firm level. All variables are as defined in the "Variables and Models" section. In the interest of brevity, results for control variables are not reported. † p .10, * p .05, ** p .01, *** p .001.*

In another test, Asset4 environmental and social scores for 2009 are replaced by Bloomberg environmental and social disclosure scores in 2009. These disclosure scores are used as a proxy for a firm's environmental and social performance, as these are based on "hard" information, which as Clarkson et al. (2008) find is difficult for poor performers to mimic. Finally, three different datasets are used at the same time for the year 2009. In other words, board attributes data is from Asset4, environmental and social scores are from Bloomberg and the CSR strategy variable is based on hand collected data. Similar results are generated for the latter two sets

of analyses (not reported). Overall, these findings are consistent with the main findings in Table 6.5 and 6.6. Hence, self-reporting bias of the same data source used is less likely in this study.

6.5 Discussion and conclusions

This chapter examines the relations among board CSR orientation, CSR strategy and firm environmental and social performance. Using a large sample of UK listed firms, it is found that boards having certain CSR-conducive attributes particularly independent directors, women directors and directors with financial expertise are more likely to develop a multi-pronged CSR strategy which in turn translates into superior environmental and social performance. Furthermore, it is found that firms with better environmental and social performance tend to strengthen their board level CSR orientation. In other words, the link between firms' board CSR orientation, CSR related strategy, and their environmental and social performance is found to be endogenous and self-reinforcing.

Research in the field of the determinants of CSR performance has attracted the attention of scholars from diverse disciplines including management and corporate governance. This study makes significant contributions to existing literature. While the findings are consistent with the theoretical predictions and empirical findings of studies from both streams of literature, this chapter builds on these studies by making new conceptual and methodological advancements. For studies drawing on the resource-based view of the firm (e.g., Al-Tuwaijri et al., 2004; Clarkson et al., 2011), it builds conceptually and improves methodologically by incorporating variables that directly measure board level competencies and strategies that lead to superior environmental and social performance. For studies drawing on the resource dependency theory and examining the link between board attributes and CSR performance, it builds conceptually by developing a theoretical model based on Hermalin and Weisbach (2003).

Chapter 7: Conclusions and implications

The primary aim guiding this entire research is to investigate whether corporate environmental and social responsibility matters for firm performance in the UK. To meet this aim, three research objectives were developed: first, to investigate the relation between firms' ESD and their operating profitability, as well as to investigate the potential causality regarding this link; second, to examine the link between ESD and firms' market value, employee productivity and carbon eco-efficiency respectively; and finally to examine the relations among CSR related board attributes, CSR strategy and firms' environmental and social performance. Three empirical studies are conducted in chapter 4, 5 and 6 respectively to address these research objectives.

7.1 Research findings and implications

Chapter 4 examines the link between firms' environmental and social disclosures and their operating profitability. It is found that more profitable firms tend to make more environmental and social disclosures. These findings are consistent with the accounting and economics based arguments that environmental and social disclosures are a real as well as an opportunity cost that more profitable firms with higher slack resources are better able to afford. Moreover, it is found that while current operating performance (which is relevant for current environmental impact) matters for current environmental disclosures; it is the past operating performance that drives current social disclosures (as per the results of Granger causality test). The reason for the latter finding could be that effects of past profitability and presumably past investments in social arena become apparent only in the subsequent period, which is then reported.

Chapter 5 investigates the relation between firms' environmental and social disclosures and their market value, employee productivity and carbon eco-efficiency. It is found that higher overall environmental and social, but particularly social disclosures matter to investors. Investors appear to be placing higher values on firms seen to be behaving in a socially responsible manner. More responsible behaviour in the social arena as reflected by its subsequent disclosure, helps mitigate the information asymmetry and hence the perceived social risks of the firm. Therefore, investors place higher values on such firms. In addition, the results of the sub tests

(i.e., the link between a firm's social (environmental) disclosure and its social (environmental) performance) show that more social (environmental) disclosure in prior year reflects better social (environmental) performance captured by higher employee productivity (more carbon eco-efficiency) in the current year. Taken together, the results of Chapter 4 and 5 are consistent with the predictions of the voluntary disclosure theory (Verrecchia, 1983) which suggests that despite being costs, firms are willing to provide relevant information voluntarily to the market, if the expected benefits of such disclosures are higher than the associated costs.

The findings of these two chapters provide several implications. From a regulatory perspective, the findings imply that if higher and better quality disclosures of a firm's environmental and social performance are desirable; and if these are profit and resource dependent, there may be room for some minimum regulatory requirements for such disclosures, coupled with economic incentives that encourage firms to behave in an environmentally and socially responsible manner. For investors, the findings suggest that while environmental disclosure is value relevant, so is social disclosure. To date, most research in CSR has focused on the link between firms' environmental disclosures and their economic performance. These findings suggest that social disclosures matter perhaps more to investors, implying that investors are more sensitised to how firms address their human relation challenges.

Chapter 6 examines the relations among board attributes, firm CSR strategy and its environmental and social performance. It is found that boards having certain CSR-conducive attributes particularly independent directors, women directors and directors with financial expertise, are more likely to develop a multi-pronged CSR strategy which in turn translates into superior environmental and social performance. Furthermore, it is found that firms with better environmental and social performance tend to strengthen their board level CSR orientation.

These findings provide some useful implications for industry as well as the academia. For industry, these findings suggest that firms with the combination of right people on the board and the right CSR strategy are likely to be better equipped in meeting their environmental and social challenges. For academia, the findings suggest that in order to develop a more comprehensive analysis, it is important to incorporate explicitly the two sets of factors, namely board attributes and CSR strategy variables,

in any analysis of the drivers of CSR performance. In particular, for research scholars working in the field of CSR, whether from a management or a governance perspective, the findings imply that in order to develop a more holistic understanding of how corporate boards are responding to CSR challenges, it is important to consider explicitly the links between director characteristics, board level decisions and firm CSR performance, taking into account the potential endogeneity of these links. The approach adopted in this study to the best of my knowledge, provides the first step in this direction. From the broader corporate governance research perspective, the conceptual and methodological approach adopted in this study, can be adapted to any study of the links between various aspects of board attributes, board decisions and firm performance.

In addition, the finding of the endogenous link between board attributes and CSR performance has significant policy implications. First, if board attributes and firm performance are indeed endogenous outcomes, then policy makers need to take into consideration the implications of this endogeneity when considering CSR related policies affecting the design of the corporate boards. For example, one policy implication of this finding would be that for poor CSR performers, mandating the inclusion of women on board (which is currently under debate in policy circles in the UK and EU), could act as a welcome exogenous shock for improving their CSR performance. Second, the findings of a virtuous circle between board CSR attributes, CSR strategies and CSR performance, while consistent with the predictions of RBV theory, raise concerns about how firms are using these competitive advantages. As the gap between the leads and the laggards in CSR performance widens (which the findings of the virtuous circle imply), this could either be a source of the 'good' or the 'bad' of CSR (Devinney, 2009). If it is the good, then social entrepreneurship on the part of leading corporations can enhance the societal wellbeing; but, if it is the bad, then firms may be using CSR to create regulatory competition, with the aim to squeeze out the laggards from the market, to the detriment of competitive markets (Devinney, 2009). Hence, it is important for regulatory bodies to be mindful of these consequences when designing policies related to CSR.

7.2 Research limitations

There are some limitations of this research. One important limitation is that this entire analysis relates to the largest listed firms in the UK. Environmental and social disclosures are also important for smaller firms. Future work could include smaller firms to examine links between their environmental and social disclosures and financial performance, but until smaller firms start reporting their environmental and social information; scope for such work may be limited.

Second, this study is limited to a single country – future research can include several countries or extend similar analysis to compare two different countries. For example, future research can examine the links among CSR related board attributes, CSR strategies and firms' environmental and social performance in developing countries. Moreover, a comparative study between the UK and the US context can also be carried out to test whether similar results hold.

Finally, some variables can be captured in a more comprehensive way. For example, employee productivity can be measured by using an employee satisfaction based survey that can better reflect employee productivity. In addition, Business ethics are moral principles that guide the way a business behaves. It can be argued that environmental and social issues can be linked with business ethics, which can be investigated by conducting interviews with CSR practitioners in future research.

7.3 Future research

The results reveal that it is not just environmental but social disclosures that investors value. To date, most research in CSR has focused on firms' environmental aspects. It would be worthwhile for future research to examine in greater detail the social aspects of CSR, particularly the link between social disclosure, indicators of social performance and financial performance. It may also be worth examining the influences of individual environmental and social indicators on firm performance. For instance, investigate the aspects of social indicators which add economic value such as employee CSR training and employee health and safety policy. Furthermore, future research can also examine the levels or content of environmental and social disclosures through in-depth case study or survey based analysis. For example, collect a firm's sustainability report over several years, read and codify its information to examine the real motivation behind its reports. In other words, it is worth noting

that from a theoretical perspective, information about a firm's environmental and social disclosures can be open to questions about impression management and institutional influences etc.

The findings suggest that it is important to consider explicitly board level governance structures and CSR strategy in an analysis of firms' social or environmental performance. It would be useful for future research to examine in more depth the roles that various human and relational capital characteristics on the board like education, professional experience and social networks may play in achieving firms' CSR goals. In addition, other governance mechanisms such as shareholder activism, institutional ownership influences on firms' CSR disclosures and/or performance can be further explored.

Appendices

Appendix 1: Review of existing corporate social responsibility related indices

CSR assessment tools	What the tool covers	Data sources/methodology	Advantages and/or drawbacks
Moskowitz (1972) reputation index	Rank firms in terms of outstanding, honorable mention or worst	Survey-evaluated by the author, a panel of businessmen and MBA students	<u>Drawback:</u> - Only one dimension measurement
Council of Economic Priorities (CEP) in 1977	<ul style="list-style-type: none"> - Environment - Charitable giving - Women in management - Minority management - Animal testing - Information disclosure - Community outreach - South Africa - Family benefits - Military work - Nuclear involvement 	Each company's social performance is objectively measured in eleven issue areas summarized in CEP's unique rating system. Company performance is monitored throughout the year with changes noted in quarterly reports.	<u>Advantage:</u> - Researches in the 1970s have used the CEP rating broadly
Carroll corporate social performance (CSP) model (1979, 1991)	<p>A three-dimensional model of corporate social performance (1991)</p> <ul style="list-style-type: none"> -social responsibilities can be categorized into four groups: economic, legal, ethical and discretionary responsibilities, which are not mutually exclusive -include 6 social issues: consumerism, environment, discrimination, product safety, occupational safety and shareholders -social responsiveness philosophy 	<p>Carroll (1979) proposed a model that contains the following four categories of corporate responsibility in decreasing order of importance:</p> <ul style="list-style-type: none"> a) Economic –be profitable; b) Legal - obey the law; c) Ethical- do what is right and fair, and avoid harm; d) Discretionary / philanthropic- be a good corporate citizen. 	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> - A multi-dimensional model of CSP - The model is simple, easy to understand and has an intuitively appealing logic, - Most durable and widely cited in the literature, has been tested and supported by previous findings <p><u>Drawbacks:</u></p> <ul style="list-style-type: none"> - Gives top priority to the economic dimension as an aspect of CSR - The major problem is that social issues

			change and they differ for different industries
McGuire et al. (1988) Fortune magazine's rating of corporate reputation	<p>Eight attributes</p> <ul style="list-style-type: none"> - Quality of management - Quality of products and services offered - Innovation - Value as a long-term investment - Soundness of financial position - Ability to attract and retain talented people - Responsibility to the community and the environment - Wise use of corporate assets 	<p>Fortune has conducted the survey each fall since 1982 and published summary results each January. The survey covers the largest firms in 20-25 industry groups (the number of industry groups varies from year to year). Over 8000 executives, outside directors, and corporate analysts are asked to rate the ten largest companies in their industry on 8 attributes; and each attribute scores from 0 (poor) to 10 (excellent).</p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> - It provides comparable data over an extended period - The number of respondents is comparable or superior to those of other ratings. <p><u>Drawbacks:</u></p> <ul style="list-style-type: none"> - Respondents rate only firms in an industry with which they are familiar (i.e., respondents are selected for their knowledge of a particular industry rather than for their specific knowledge of or interest in CSR) - Evidence for the validity of the evaluations comes from empirical studies using other dimensions of the Fortune survey and have found that the Fortune evaluations of firms' financial performance are highly correlated with accounting and stock-market based performance measures.
Adams et al. (1991) New Consumer Group (NCG) ratings	<p>13 ratings produced by NCG, 4 main elements including CSR disclosure, women's position, ethnic minorities' position, philanthropy and environmental actions</p> <ul style="list-style-type: none"> - CSR disclosure (-2, 2) - the advancement of women (-1, 2) - the advancement of ethnic minorities (-1,1) - philanthropy or charitable giving and involvement to community projects (-1,1) - environmental action to reduce its environmental impact or improve its environmental protection 	<p>The assessment of companies in the NCG book covers the years 1988 and 1989. The ratings were complemented by primary data collected via a multi-wave mail survey directed to companies. The last four aspects are applied to relevant industries not all firms.</p>	<p><u>Advantage:</u></p> <ul style="list-style-type: none"> - Previous researchers do not differentiate between CSR performance and CSR disclosure, the NCG ratings include CSR disclosure as one of the CSR performance measurement <p><u>Drawback:</u></p> <ul style="list-style-type: none"> - The main focus of the NCG organisation is the consumer sector. Sectors such as financial services and media related products were not included, due to the difficulties associated in the assessment of CSR performance

	<ul style="list-style-type: none"> - performance (0,2) - donation to the British political parties in the 1986-1990 period (yes/no) - subscription to the economic league (yes/no) - a significant effect on the environment (0,3) - respect for life - respect for people - Doing business with “oppressive regimes” - Production and/or sales of military equipment - business relationships with the least developed countries 		
KLD rating	<p>13 dimensions of CSR</p> <ul style="list-style-type: none"> - community - corporate governance - diversity - employee relations - environment - human rights - product quality and safety - alcohol - firearms - gambling - military - nuclear power - tobacco 	<p>Data are collected in a disciplined process from a wide variety of company, government, non-government organisation and media sources, using surveys, financial statement information, reports from mainstream media, government documents and peer-reviewed legal journals. Once the information is collected, KLD rates the social, environmental and governance performance of companies using a proprietary framework of positive and negative indicators. Companies are rated in seven major qualitative issue areas: Environment, Community, Corporate Governance, Diversity, Employee Relations, Human</p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> - Widely accepted by practitioners and academics as an objective measure of CSR - All companies in the S&P 500 are rated. - Each company is rated on multiple attributes considered relevant to CSP - A single group of researchers, working independently from the rated companies or any particular brokerage house, applies the same set of criteria to related companies - The criteria are applied consistently across a wide range of companies, with data gathered from a range of sources, both internal and external to the firm <p><u>Drawbacks</u></p> <ul style="list-style-type: none"> - The binary ratings do not distinguish between the levels of e.g., hazardous waste production.

		Rights and Product Quality and Safety. Analysts assign Strengths and Concerns associated with these issues, providing a social and environmental profile of companies. The business involvement screens are associated with activities that are controversial to certain social investors.	<ul style="list-style-type: none"> - Firms in heavy polluting industries like Oil and Gas have lower KLD score than other firms that have very limited or no disclosure to e.g., producing hazardous waste, regardless how well the firm manages its hazardous waste. - The number of measures within each of KLD's dimensions can skew overall CSP scores. E.g., a firm has a total of 5 strengths and 10 concerns. By definition, the KLD ratings system is biased toward a higher concern score for those industries disclose information about their environmental concerns.
EIRIS performance criteria	<p>The data is in the form of a searchable database with roughly 170 questions covering the whole range of social concerns.</p> <ul style="list-style-type: none"> - Environment - Employee - Community and Society - Human rights - Supply chain <p>For example, key ESG criteria - board practice, bribery, human rights, labor standards in the supply chain, health and safety, environment, and climate change</p>	The thrust of the database is overwhelmingly based on exception reporting or negative screening.	<p><u>Advantage:</u></p> <ul style="list-style-type: none"> -The answers or responses are both quantitative and qualitative <p><u>Drawbacks:</u></p> <ul style="list-style-type: none"> -There is little order in the database, questions can jump from one area to another and then back again. - An entry is made, if something 'bad' has been noted. If there is no negative information, no comment is made. Therefore, a company with little comment or profile would be judged to have high CSR and vice versa. - Do not distinguish between general and industry-specific ESG criteria.
Corporate Knights	<p>10 KPIs and a transparency indicator</p> <ul style="list-style-type: none"> - Energy productivity - Carbon productivity - Water productivity - Waste productivity 	Data is sourced from ASSET4, a Thomson Reuters business, and the BLOOMBERG PROFESSIONAL. The KPIs were	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> - ESG information was obtained from a group of data providers rather than a single data provider

<p>Research Group (CKRG) index and rank for Global 100 (2010)</p>	<ul style="list-style-type: none"> - Leadership diversity - CEO-to-average worker pay - % tax paid - Sustainability leadership - Sustainability remuneration - Innovation capacity - Transparency <p>Each company receives a score of 0 to 1 per KPI and a score of 0 to 1 on the transparency indicator.</p>	<p>developed by CKRG, a signatory to the UNPRI.</p>	<ul style="list-style-type: none"> - ESG data was integrated with financial data to enhance analysis - A greater number of companies from emerging markets were included in the analysis - Cross industries
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Appendix 2: E, S and G indicators with Bloomberg fields

Environmental

Percent of Disclosure	PERCENT_OF_DISCLOSURE
Direct CO2 Emissions	DIRECT_CO2_EMISSIONS
Indirect CO2 Emissions	INDIRECT_CO2_EMISSIONS
Travel Emissions	TRAVEL_EMISSIONS
Total CO2 Emissions	TOTAL_CO2_EMISSIONS
CO2 Intensity (Tonnes)	CO2_INTENSITY
CO2 Intensity per Sales	CO2_INTENSITY_PER_SALES
GHG Scope 1	GHG_SCOPE_1
GHG Scope 2	GHG_SCOPE_2
GHG Scope 3	GHG_SCOPE_3
Total GHG Emissions	TOTAL_GHG_EMISSIONS
NOx Emissions	NOX_EMISSIONS
SO2 Emissions	SO2_EMISSIONS
SOx Emissions	SULPHUR_OXIDE_EMISSIONS
VOC Emissions	VOC_EMISSIONS
CO Emissions	CARBON_MONOXIDE_EMISSIONS
Methane Emissions	METHANE_EMISSIONS
ODS Emissions	ODS_EMISSIONS
Particulate Emissions	PARTICULATE_EMISSIONS
Total Energy Consumption	ENERGY_CONSUMPTION
Electricity Used (MWh)	ELECTRICITY_USED
Renewable Energy Use	RENEW_ENERGY_USE
Water Consumption	WATER_CONSUMPTION
Water/Unit of Prod (in Liters)	WATER_PER_UNIT_OF_PROD
% Water Recycled	PCT_WATER_RECYCLED
Discharges to Water	DISCHARGE_TO_WATER
Waste Water (Th Cubic Meters)	WASTE_WATER
Hazardous Waste	HAZARDOUS_WASTE
Total Waste	TOTAL_WASTE
Waste Recycled	WASTE_RECYCLED
Paper Consumption	PAPER_CONSUMPTION
Paper Recycled	PAPER_RECYCLED
Fuel Used (Th Liters)	FUEL_USED
Raw Materials Used	RAW_MAT_USED
% Recycled Materials	PCT_RECYCLED_MATERIALS
Gas Flaring	GAS_FLARING
Number of Spills	NUMBER_SPILLS
Amount of Spills (Th Tonnes)	AMOUNT_OF_SPILLS
Nuclear % Total Energy	NUCLEAR_%_ENERGY
Solar % Total Energy	SOLAR_%_ENERGY
Phones Recycled	PHONES_RECYCLED
Environmental Fines #	NUM_ENVIRON_FINES
Environmental Fines \$	ENVIRON_FINES_AMT

ISO 14001 Certified Sites	ISO_14001_SITES
Number of Sites	NUMBER_OF_SITES
% Sites Certified	%_SITES_CERTIFIED
Environmental Accounting Cost	ENVIRONMENTAL_ACCTG_COST
Investments in Sustainability	INVESTMENTS_IN_SUSTAINABILITY
Energy Efficiency Policy	ENERGY_EFFIC_POLICY
Emissions Reduction Initiatives	EMISSION_REDUCTION
Environmental Supply Chain Management	ENVIRON_SUPPLY_MGT
Green Building Policy	GREEN_BUILDING
Waste Reduction Policy	WASTE_REDUCTION
Sustainable Packaging	SUSTAIN_PACKAGING
Environmental Quality Management Policy	ENVIRON_QUAL_MGT
Climate Change Policy	CLIMATE_CHG_POLICY
New Products - Climate Change	CLIMATE_CHG_PRODS
Biodiversity Policy	BIODIVERSITY_POLICY
Environmental Awards Received	ENVIRONMENTAL_AWARDS_RECEIVED
Verification Type	VERIFICATION_TYPE

Social

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

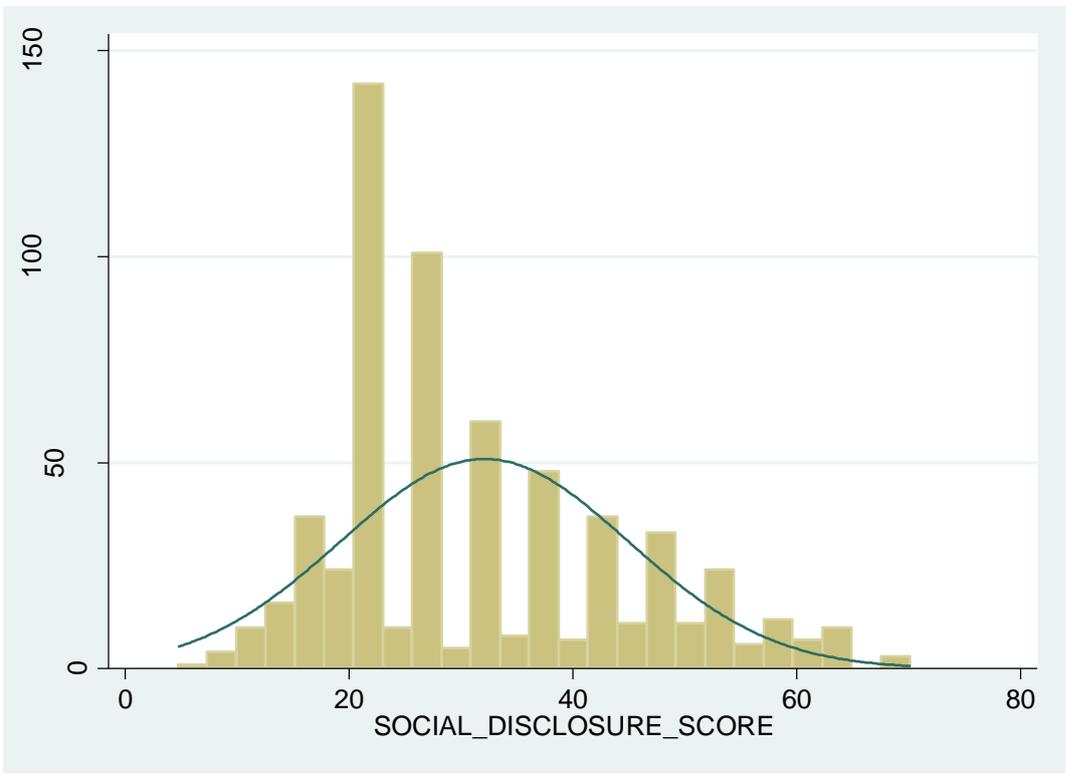
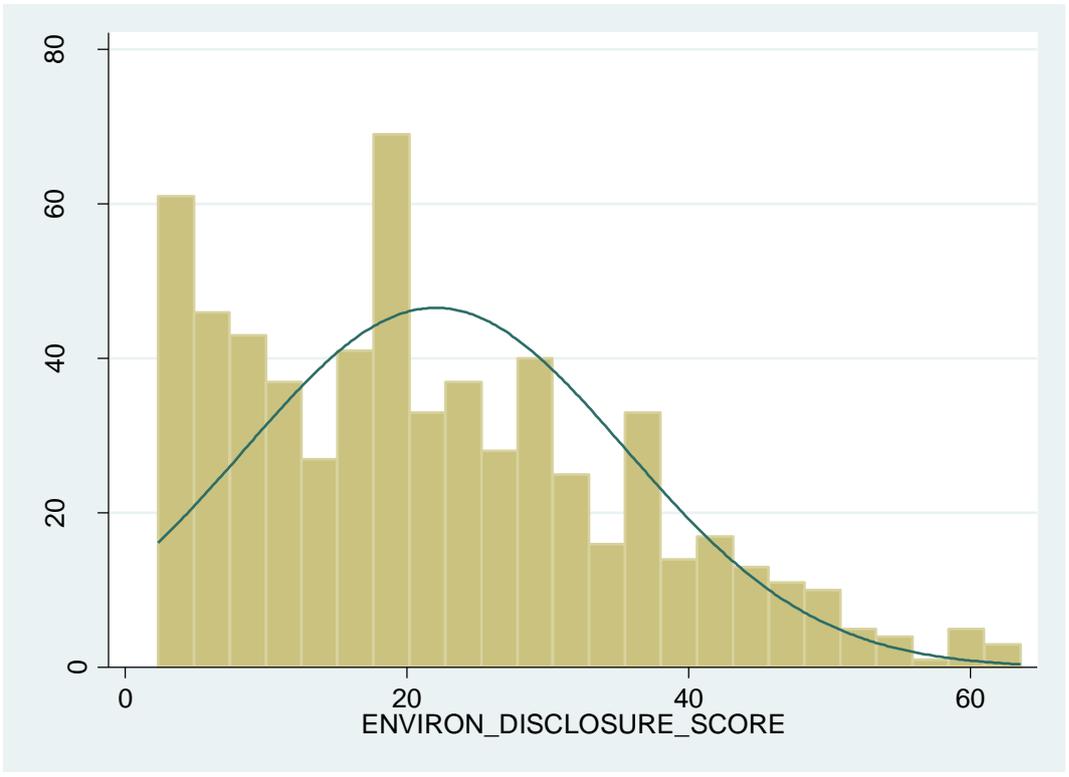
Governance

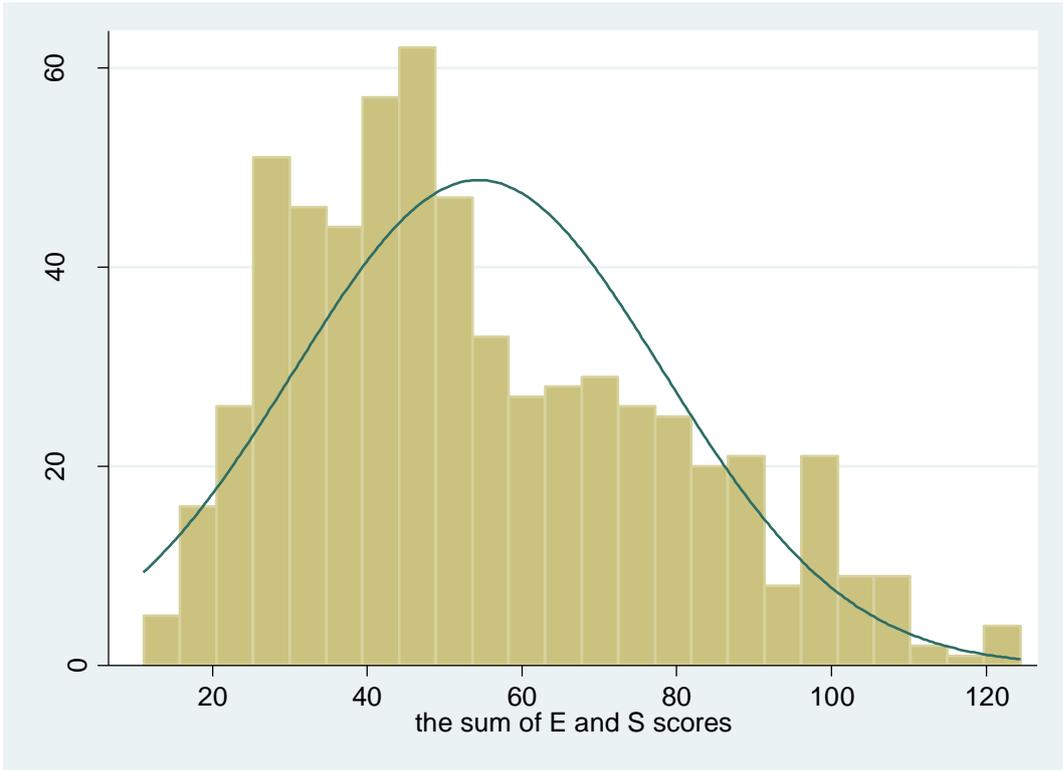
Size of the Board	BOARD_SIZE
Indep Directors	INDEPENDENT_DIRECTORS
% Indep Directors	PCT_INDEPENDENT_DIRECTORS
% Women on Board	%_WOMEN_ON_BOARD
Board Average Age	BOARD_AVERAGE_AGE
Board Age Limit	BOARD_AGE_LIMIT
Board Duration (Years)	BOARD_DURATION
# Board Meetings	BOARD_MEETINGS_PER_YR
Audit Committee Meetings	AUDIT_COMMITTEE_MEETINGS
Board Mtg Attendance	BOARD_MEETING_ATTENDANCE_PCT
Political Donations	POLITICAL_DONATIONS
CEO Duality	CEO_DUALITY
Business Ethics Policy	ETHICS_POLICY
GRI Criteria Compliance	GRI_COMPLIANCE

Appendix 3: Variable definitions, measures and data sources

Category	Measure	Definition/Measurement	Source
Environment and social disclosures	E	Environmental score (60 environmental data points adjusted by industry and weighted by importance) ranges from 0 to 100%.	Bloomberg
	S	Social score (26 social data points adjusted by industry and weighted by importance) ranges from 0 to 100%.	Bloomberg
Governance	G	Governance score (14 governance data points adjusted by industry and weighted by importance) ranges from 0 to 100%.	Bloomberg
Slack	Slack	Slack resources – natural logarithm of the sum of cash & short-term investments (02001) and total receivables (02051).	Worldscope
Operating Profitability	ROA	Return on assets – the ratio of earnings before interest and taxes (18191) to total assets (02999) at the beginning of the year i.e. $EBIT_t/TA_{t-1}$.	Worldscope
	ROE	Return on equity (DWRE) - the ratio of net income before preferred dividends minus preferred dividend requirement to last year's common equity. The calculation differs from Worldscope. Datastream data is based on the current period, and Worldscope is an average of prior and current period Equity.	Datastream
	ROS	Return on sales – the ratio of earnings before interest and taxes (18191) to net sales (01001).	Worldscope
Firm characteristics	Size_emp	Size – natural logarithm of employee number (07011).	Worldscope
	Size_sales	Size – natural logarithm of net sales (01001).	Worldscope
	Leverage	Leverage - Total debt (03255) divided by total assets (02999).	Worldscope
	Fin_acts	Financial activities - the ratio of net proceeds from sale/issue of common and/or preferred stock (04251) during the year divided by total assets (02999) at the beginning of the year.	Worldscope
	Capex	Capital expenditure - the ratio of capital expenditures (04601) divided by net sales (01001).	Worldscope
	Media	Media exposure – natural logarithm of the number of environmental news exposed. It is obtained by searching company's name and any one of the terms 'environment sustainability', 'waste management', 'pollution' and 'environmental award' within all English language news published over the world. Specific date for each year is from 1 January 200X to 31 December 200X.	Nexis@UK
	Str_holds	Strategic holdings - the percentage of total shares in issue held strategically and not available to ordinary shareholders (NOSHST). Holdings of 5% or more are counted as strategic.	Datastream
Capital market	Analyst coverage	Analyst coverage - number of analysts issuing earnings forecasts for the firm.	IBES
Market value	Q ratio	Tobin's Q - total assets (02999) plus market value of equity (MV) minus book value of equity (03501) divided by total assets (02999).	Datastream
Other stakeholders	Employee productivity	Sales (01001) to employee number (07011) ratio.	Worldscope
	Carbon intensity	Carbon emission to sales (01001) ratio.	Carbon Disclosure Project

Appendix 4: A plot of E/S/ES disclosure distribution





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