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Corporate Environmental Disclosure and Corporate Governance: A Critical Review

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Abstract: The past four decades have witnessed an increasing global concern for the environment. The growing public concern over the natural environment substantially increased awareness of corporate environmental responsibility, which accordingly triggered the need for environmental accounting and reporting. Corporate environmental disclosure has been a significant area of academic interest, and has accumulated a substantial literature since the 1970s. Environmental disclosures are influenced by a variety of explanatory factors. Previous research has acknowledged that good corporate governance is associated with increased transparency and credible financial disclosure. Through a review of the prior literature, this paper investigates the impact of corporate governance characteristics on the quantity and quality of corporate environmental disclosure practices in companies' annual reports. The review highlights the distinct nature of corporate environmental disclosure items, the different types of environmental information content, as well as the different areas of activity to which the environmental disclosure relates. However, discussion and analysis of the relationship in question revealed the failure of prior research to establish consistent and conclusive results. Implications and potential prospects are identified for future research.

Keywords: Corporate Social Responsibility, Corporate Environmental Disclosure Quantity, Corporate Environmental Disclosure Quality, Corporate Governance.

1. Introduction

The past four decades have witnessed an increasing global concern for the environment. This concern emerges mainly from the threat caused by the harmful effects and environmental problems resulting as an impact of economic growth. Many steps have been taken toward the protection of the environment from pollution and the conservation of natural resources, as a result of the consideration given to the social responsibility on one hand and as an application to, and compliance with, laws and regulations on the other hand. In this regard, the role of environmental accounting and reporting has emerged as a result of a concern for the relationship between the organization and the natural environment (AbuRaya, 2012).

The growing public concern over the natural environment substantially increased awareness of corporate environmental responsibility. Companies are increasingly facing intensifying challenges to disseminate information about their environmental activities. In a parallel movement, corporate governance has tremendously attracted attention in recent years. The term corporate governance rarely existed before 1990s (Keasey et al., 2005b). Factors contributing to the increasing concern with corporate governance issues include unfriendly takeovers, institutional investors growing importance, increasing attention to directors' legal liability, pressure for more efficient and effective corporations, economic liberalisation, deregulation of industry and business, the demand for new corporate values and stronger adherence to natural laws (Aras and Crowther, 2008; Joyner and Payne, 2002; Leblanc and Gillies, 2005).

Corporate environmental disclosure has been a significant area of academic interest, and has accumulated a substantial literature since the 1970s. A considerable body of literature from a

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wide range of theoretical backgrounds concluded that environmental disclosures are an important phenomenon employed by corporations (Gray et al., 2001) and are influenced by a variety of explanatory factors. Prior research has been primarily concerned with the extent and nature of corporate environmental disclosure within annual reports and its trend over time; its relationship to corporate reputation, economic performance and environmental performance; as well as the effect of certain corporate characteristics on the tendency to disclose environmentally relevant information.

However, relatively little research has been conducted that directly examines the relationship between corporate environmental disclosure and corporate governance. This is especially true in terms of environmental disclosure quality as opposed to the quantity of such disclosure (AbuRaya, 2012). In addition, not all the principles of corporate governance have been examined in the literature, despite the fact that previous research has acknowledged that good corporate governance is associated with increased transparency and credible disclosure (see Ajinkya et al., 2005; Cormier et al., 2010; Dunstan, 2008; Gul and Leung, 2004).

The present study aims at examining the relationship between corporate governance characteristics and each of the quantity and the quality of corporate environmental disclosure practices in companies' annual reports. The review provides an in-depth exploration of quantity versus quality identification and assessment issues. It also highlights the distinct nature of corporate environmental disclosure items, the different types of environmental information content, as well as the different areas of activity to which the environmental disclosure relates. The following two streams of studies are relevant to the present study: prior studies examining the relationship between environmental disclosure quantity and corporate governance and prior studies examining the relationship between environmental disclosure quality and corporate governance.

The remainder of this paper is organized as follows. The first section provides an overview of corporate environmental disclosure practices, introduces the concept of corporate governance and examines prior studies on the relationship between corporate governance characteristics and each of the quantity and the quality of corporate environmental disclosure practices in companies' annual reports. The second section is devoted to the discussion and analysis of prior research, exploring possible reasons for the failure of prior research to establish consistent and conclusive results and identifying any gaps in the existing literature. The final section summarizes the conclusions drawn and suggests some prospects for future research.

2. Literature Review

Corporate social responsibility (CSR) reporting, of which environmental reporting is a part, is not a new phenomenon and has been traced as far back as 5000 BC in Egypt (Anderson, 1989). However, environmental reporting within corporate annual reports has attracted increased interest since the early 1990s (Jones, 2011).

Environmental disclosures are simply defined as "those disclosures pertaining to the impact that an organizational process or operation may have on the natural environment" (Campbell, 2004: 108). In a detailed manner, Berthelot et al. (2003: 2) define corporate environmental disclosure as "the set of information items that relate to a firm's past, current and future environmental management activities and performance. Corporate environmental disclosure also comprises information about the past, current and future financial implications resulting from a firm's environmental management decisions or actions." From a stakeholders-agency theory perspective, corporate environmental disclosure can be defined as "the process of disseminating information on the impact corporate economic activities have on the natural environment for use by diverse stakeholders" (AbuRaya, 2012: 18). The most distinguishing feature of environmental disclosure is its voluntary nature. Consequently, environmental reports are characterized by their diversity in terms of disclosure quantity and quality.

Various types of environmental information exist in terms of themes and topics. The absence of definite environmental information

content has motivated initiatives to develop a comprehensive framework for environmental disclosures. A remarkable and prominent framework is the Global Reporting Initiative (GRI) developed in co-operation with the United Nations Environment Programme (UNEP). Corporate environmental disclosure is taken to comprise disclosures relating to the company's environmental policies, environmental product and process-related, compliance with environmental laws and standards, environmental auditing, sustainability and other environmentally-related information (AbuRaya, 2012).

Quality is a generic term that has different meanings to different people. Botosan (2004) argues that the definition of quality should be based on well-supported frameworks elaborated by professional accounting bodies and standard setters because they reflect a generally accepted notion of disclosure quality. Consistent with Botosan's (2004) approach, corporate environmental disclosure quality can be defined in terms of the information qualities or characteristics identified by the International Accounting Standards Board (IASB); comparability, understandability, relevance, and reliability (IASB, 1989) (AbuRaya, 2012).

A distinctive feature of such environmental reporting initiatives and frameworks is an attempt to relate corporate governance structure, social and environmental accounting and stakeholder reporting (Boesso and Kumar, 2007). Corporate governance simply refers to how a corporation is governed (NACD, 2006). The Organization for Economic Co-operation and Development (OECD) defined corporate governance as "a set of relationships between a company's management, its board, its shareholders and other stockholders. Aras and Crowther (2008: 2) argued that "Corporate governance can be considered as an environment of trust, ethics, moral values and confidence – as a synergic effort of all the constituents of society – that is the stakeholders, including government; the general public etc; professional/service providers – and the corporate sector".

What constitutes good corporate governance may vary in the specific recommendations being made. However, most codes of best practices emphasize improving corporate governance practices and disclosure in five major areas: board structure, audit and financial controls, executive compensation, shareholders rights, and market for control (Fombrun, 2006). Significant progress had been made in terms of corporate governance codes and principles in several countries. The system of corporate governance is fundamentally self-regulatory (Mallin, 2001). However, government intervention indicated that self-regulation was unlikely to deliver accountability and improved corporate governance (Keasey et al., 2005a).

For the purposes of the current study, prior studies examining corporate environmental disclosure and corporate governance characteristics can be classified into two groups: the impact of corporate governance on environmental disclosure quantity and the impact of corporate governance on environmental disclosure quality. These studies are presented in chronological order to help trace the gradual evolution and development of any achievements or addition to the existing body of literature.

2.1. Examining the Relationship between Environmental Disclosure Quantity and Corporate Governance

Halme and Huse (1997) examined the relations between corporate environmental reporting in annual reports and corporate governance variables, industry variables and country variables. Empirical evidence is gathered from large corporations in Finland, Norway, Spain and Sweden, a sample of 40 companies from each of the Scandinavian countries, and Spain where only 20 Spanish firms where included in the sample. The annual reports for 1992 were content analyzed to explore the environmental reporting variables. The environmental disclosures were examined with the help of a three-class categorization in annual reports: little or no environmental information; a separate environmental section; and a separate environmental section together with an environmental policy and future action plans. Corporate governance variables identified by the study are ownership concentration and the number of board members.

Results of the logistic regression analyses indicated that the extent of a corporation's environmental impact is positively related to environmental reporting. Industry appeared to be the most important factor in explaining environmental disclosure in annual reports. Corporations in industries which are traditionally considered to be polluting, reported most on the environment. Although the number of board members were positively related to corporate environmental reporting in some of the analyses, the number of board members varied considerably among the four countries studied, and the effect mentioned seemed to depend on variations between the countries. The overall research results did not indicate any significant relationship with ownership concentration or the number of board members. Similarly, Norwegian firms seemed more likely than firms in the other countries to have some environmental reporting. This may be related to the Norwegian legislation and tougher legal requirements imposed on Norwegian companies. However, after adjusting for industry and corporate governance variables, there were differences between the environmental reporting by corporations in the three Nordic countries, where Finnish companies showed less attention to the environment than their Norwegian and Swedish counterparts.

McKendall et al. (1999) examined the effects of corporate governance structures on the incidence of corporate illegality by analyzing the relationship between environmental violations and several dimensions of corporate board structure. Environmental violations, which include non-disclosure of corporate environmental information, were categorized as serious violations and non-serious violations. Corporate governance dimensions examined include outsider dominance, dual CEO-Chairperson roles, stock ownership by officers and directors, social responsibility committees and attorneys on boards. The study also controlled for the following variables: industry profitability, firm profitability, organization size and industry concentration. Based on a sample of 150 US companies extracted from the 1000 largest business firms listed in Ward's Business Directory, Tobit regressions were carried out. The sample companies were examined for 1985, 1986, and 1987. Results demonstrated that the value of stock owned by corporate officers and directors was positively and significantly associated with serious environmental violations. Outsider dominance, joint CEO-Chairpersons, social responsibility committees and attorneys on boards were not significantly related to environmental violations. These findings cast proposals. The control variables of size, industry profitability, firm profitability and industry concentration were all significantly and mostly negatively related to environmental violations including the non-disclosure of environmental information. These findings are consistent with most previous research suggesting a significant and positive correlation between such control variables and the disclosure of environmental information.

Haniffa and Cooke (2002) examined the relationship between a number of corporate governance, cultural and firm-specific characteristics and the extent (range and scope) of voluntary disclosure in the annual reports of Malaysian companies. The survey covered 167 companies that published their annual reports during the year ended 31 December 1995. Voluntary disclosure is measured by an index of disclosure. Three corporate governance variables were found to be significant: independent non-executive director, chairperson and the proportion of family members on the board, but the relationship is negative. However, none of the cultural variables were found to be significant. Out of seventeen firm-specific variables used as control variables in the model, four were found to be significant and positively related to disclosure. These are assets-in-place, ownership structure based on the proportion of shares held by top ten shareholders, foreign ownership and profitability.

Chau and Gray (2002) examined the association of ownership structure with the voluntary disclosures – including environmental disclosures – of listed companies in Asian settings of Hong Kong and Singapore. The sample selected comprises only industrial companies including food & beverages, shipping & transportation, publishing & printing, electronics & technology, building materials & construction. Annual reports for

1997 were analyzed for a random sample of 60 Hong Kong companies and 62 Singapore companies. A voluntary disclosure checklist was developed and a voluntary disclosure index was calculated as the number of total voluntary disclosures divided by the maximum voluntary disclosures possible. The ownership variable was calculated by adding together the proportions of a equity belonging to directors and to dominant shareholders to arrive at the proportion of firm's equity owned by insiders. This figure was then used to derive the proportion of a firm's equity owned by outsiders.

A linear multiple regression analysis was used to test the association between the dependent variable of voluntary disclosure and the independent variable of ownership structure. In addition to ownership structure, a number of control variables such as firm size, leverage, size of auditors, profitability and multinationalism, were also included in the analysis. Results showed that the extent of outside ownership is positively associated with voluntary disclosures – including environmental disclosures. In particular, the results also indicated that the level of information disclosure is likely to be less in insider of family-controlled companies, a significant feature of the Hong and Singapore stock markets.

Gul and Leung (2004) examined the linkages between board outside directors on the board and voluntary corporate disclosures. The dependent variable, voluntary disclosures included environmental information items such as environmental measures and ISO or other awards. A disclosure index consisting of 44 discretionary items was developed to measure voluntary disclosures. Regression analyses of observations from 385 Hong Kong listed companies were carried out for 1996. Several control variables were added to the analyses including firm size, leverage, liquidity, profitability, auditor firm, audit committee, firm growth, listing status, consolidated firms, equity, loss, equity market liquidity and finally industry type. Results showed that the extent to which managers will disclose more corporate information is likely to be affected by the composition and quality of the board of directors. More specifically, CEO duality was associated with lower voluntary disclosures, supporting the view that the position of chairman and CEO should be separated. Results also revealed that firms with a higher proportion of expert outside directors are associated with lower voluntary disclosures. More interestingly, it was found that the negative association between CEO duality and corporate disclosures is weaker when the firm has a higher proportion of expert outside directors suggesting that the expertise of non-executive directors moderates the CEO duality/corporate disclosures relationship. The disclosure levels were also positively correlated with firm size, profitability, the presence of an audit committee, firm growth, listing status and equity financing and negatively associated with the proportion of shares held by directors and liquidity.

Haniffa and Cooke (2005) examined whether the extent of Corporate Social Disclosure (CSD) in the annual reports of Malaysian listed companies changes over time and whether there is an association with three groups of variables: cultural, corporate governance and firm-specific (control) variables. Content analysis was adopted to achieve the objectives. A final sample of 139 companies listed in KLSE was examined in 1996 and in 2002. Descriptive analysis and parametric and non-parametric tests indicated significant differences in the extent and variety of CSD for the two years despite minimal legislative guidance for such disclosures. Two different dependent variables were used in the regression models: CSDI (index) and CSDL (length) representing the variety and the extent of CSD respectively. The significant positive relationship between Malay directors and Malay shareholders with CSD practice in the annual reports of Malaysian companies suggests that disclosure cannot be culture free and is attributed primarily to government policy. Results also indicated a significant negative relationship between the composition of non-executive directors and CSD but a significant positive relationship between chairs with multiple directorships and CSD. Foreign share ownership was found to be statistically significant based on CSDI but not when the dependent variable is CSDL. In addition, size, profitability and multiple listings were all statistically related to CSD.

The industry-CSD relationship seemed to be less significant with the interaction of other variables. Similarly, gearing as proxy for risk did not seem to impact CSD.

Barako et al. (2006) investigated the extent to which corporate governance attributes, ownership structure and company characteristics influence voluntary disclosure practices including environmental disclosure. The sample consisted of all Kenyan companies (54) listed on Nairobi Stock Exchange (NSE), which were examined from 1992 to 2001. A disclosure index was used to measure the level of voluntary reporting by companies. Corporate governance characteristics examined in this study are: board composition, board leadership structure and audit committee formation. Results suggested that the extent of voluntary disclosure (including environmental disclosure) is influenced by a firm's corporate governance attributes, ownership structure and company characteristics. The presence of an audit committee was found to be a significant factor that is positively associated with the level of voluntary disclosure and the proportion of non-executive directors on the board was found to be significantly and negatively associated with the extent of voluntary disclosure. The study also found that the levels of institutional and foreign ownership have a significantly positive impact on voluntary disclosure. Large companies and companies with high debt voluntarily disclosed more information. In contrast, board leadership structure, liquidity, profitability and type of external audit firm did not have a significant influence on the level of voluntary disclosure by companies in Kenya.

Naser et al. (2006) examined factors influencing corporate social disclosure (CSD) in Qatar. They investigated the effect of firm size as measured by the firm's market capitalization and business risk as measured by the leverage and corporate growth, as well as ownership variables (government ownership, institutional ownership, and major shareholders). Content analysis was employed in the study and a checklist was developed including 15 content categories within four testable dimensions: theme, evidence, amount and location. The annual reports of a sample of 21 Qatari companies listed on the Doha Stock Exchange were analyzed for the year 1999/2000. Variations in corporate social disclosure by the sample of Qatari companies were found to be associated with the firm size as measured by the firm's market capitalization and business risk as measured by the leverage and corporate growth. However, the proportion of the institutional investors, dispersion of individual investors and government ownership proved to have little impact on the level of CSD by the sample of Qatari companies.

Ghazali (2007) examined the influence of ownership structure on corporate social responsibility (CSR) disclosure in Malaysian company annual reports. The factors examined include ownership concentration, director ownership, government ownership, company size, profitability and industry. A sample of 87 non-financial companies included in the Bursa Malaysia Composite Index was selected. The annual reports for the financial year 2001 were analyzed using a CSR disclosure checklist to measure the extent of CSR disclosure. Results from multiple regression analysis showed that two ownership variables, director ownership and the government as a substantial shareholder, which are common business attributes in Malaysia, have significant influence on CSR disclosure in annual reports. However the third ownership variable, ownership by the ten largest shareholders, was not statistically significant in explaining the level of CSR disclosure in annual reports. Both profitability and industry were not significant factors in explaining CSD.

Hossain and Reaz (2007) examined the association between company specific characteristics and voluntary disclosure by 38 listed banking companies in India. Corporate social - and hence environmental - disclosure represented one category of voluntary disclosure. The empirical investigation revealed that corporate size and assets in-place are significantly associated with disclosure, while corporate age, multiple exchange listing, business complexity, and board composition (percentage of non-executive directors) are insignificant in explaining the level of disclosure. This study is criticized for the use of a single year and one specific industry

sector. In addition, it examined the total level of disclosure as opposed to the level of disclosure within each disclosure category.

Huafang and Jianguo (2007) examined the impact of ownership structure and board composition on voluntary disclosures (including environmental disclosures) of listed companies in China. A disclosure index was developed where the score equals the total number of points awarded for voluntary disclosure of strategic, business, financial and non-financial information. Ownership structure variables included blockholder, managerial, state, legal-person and foreign listing/shares ownership. Board composition variables included the proportion of independent directors and CEO duality. Control variables included firm size, leverage, firm growth and auditor reputation. A sample of 559 firms covering 11 industry sectors was drawn from firms listed on Shanghai Stock Exchange (SSE) in 2002. Results of the regression analysis revealed that higher blockholder ownership and foreign listing/ shares ownership are associated with increased disclosure. However, managerial ownership, state ownership and legal person ownership are not related to disclosure. An increase in independent directors increased corporate disclosure and CEO duality was associated with lower disclosure. The study also found that larger firms have greater disclosure, while firms with growth opportunities are reluctant to disclose information voluntarily. However, no significant relationship was found between voluntary disclosure and each of auditor reputation and leverage.

Lim et al. (2007) examined the association between board composition and voluntary disclosure in the annual reports of 181 Australian companies. They developed a checklist of 67 voluntary items being classified as: strategic, non-financial and financial information. The non-financial information category is that of social and environmental disclosure, which was examined separately. A two-stage multivariate analysis was used to deal with the problem of endogeneity. In the first stage they estimated the relation between the ratio of independent directors to total board size and firm characteristics that may be related to voluntary disclosure. In the second stage they investigated the effect of board composition, captured by the fitted values from the first stage, on the extent of voluntary disclosure. The results indicated a positive association between board composition and total voluntary disclosure. Furthermore, the results indicated that (a) boards composed largely of independent directors voluntarily disclose more forward looking quantitative and strategic information and (b) board structure has no bearing on non-financial and financial voluntary disclosure. Other drivers of voluntary disclosure of information in companies' annual reports were firm size, shareholder concentration, industry classification, management compensation and investment growth set.

Rizk et al. (2008) used a sample of 60 Egyptian manufacturing companies to address the social and environmental reporting practices in the corporate annual report for the financial year 2002. They employed an un-weighted disclosure index consisting of 34 information items covering environmental, energy, human resources, customer and community involvement issues. The impact of private ownership, government ownership and industry membership on corporate social and environmental reporting were examined. A random sample of Egyptian companies in the industrial sector were selected from nine high polluting industries including food, beverage and tobacco, ceramics, chemicals, cement, pharmaceuticals, building materials and construction, textiles, and mills and storage. Non-parametric tests, i.e. ANOVA tests, were used to test the developed hypotheses.

The study concluded that the extent of corporate social responsibility is low. In addition, the nature of disclosures was found to be overwhelmingly descriptive. Findings indicated that industry membership is a statistically significant factor relative to the category of disclosure. In addition, government owned companies disclose more employee related information than private companies. On the other hand private companies were found to disclose customer related, environment related, and community related information more than governmental owned companies. However, the

study focused on the legal form of the company rather than the ownership percentages. The study recommended the use of a reasonably large sample that covers both the industrial and non-industrial sectors as well as a longitudinal analysis of the sample companies.

Al Arussi et al. (2009) investigated the relationship between the extent of voluntary financial and environmental disclosures on the internet and each of ethnicity of CEO, leverage, level of technology, existence of dominant personalities, profitability and firm size. A sample of 201 Malaysian listed companies on the Bursa Malaysia's Main and Second Boards was analyzed for the financial year 2005. The sample was selected using the disproportionate stratified random sampling approach. Multivariate tests and linear regression analyses were undertaken to examine the hypotheses. The results indicated that level of technology, ethnicity of CEO and firm size are determinants of both internet financial and environmental disclosures. However, the existence of a dominant personality was found to negatively affect the level of financial disclosures but not environmental disclosures. Yet leverage and profitability did not show any significant relationship with either financial or environmental disclosures.

Grüning and Bergerernst (2010) examined the association of disclosure and corporate governance for a sample of 6,580 firms listed in the US between 2003 and 2007. Disclosure is measured by an innovative artificial intelligence approach in ten distinctive information dimensions (financial, customers, value chain, employees, R&D, strategy, governance, stock market, environment, society) and corporate governance is measured by an aggregate index of 48 variables in 8 categories (board, audit, charter/bylaws, state of incorporation, ownership, executive and director compensation, progressive practices, director education). Several control variables were used including: size, ownership concentration, equity ratio, age, growth rate, leverage, capital intensity, loss, intangible assets, stock return, stock return volatility, issuer firm, type of auditor, market-to-book ratio, stock turnover, Tobin's Q, previous year disclosure and previous year corporate governance. Results indicated that well-governed firms opt into a more comprehensive disclosure policy and provide a higher degree of disclosure. Yet, this relation is not homogeeous across all corporate governance dimensions. For the categories audit, state of incorporation, ownership and progressive practices, a strong positive effect on corporate governance was detected, whereas for the director and executive compensation category a negative effect was revealed. In a 3SLS modeling, corporate governance and disclosure were found to positively interact in increasing firm valuation in terms of Tobin's q. In general, a complementary relationship between disclosure and corporate governance structure was documented but evidence has been provided that this relationship varies across different corporate governance dimensions.

Peters and Romi (2011) examined the determinants of the voluntary reporting of greenhouse gas (GHG) emission accounting information. The two main variables of interest used in evaluating the relationship between corporate governance and GHG disclosures were the existence of an environmental committee on the board and a sustainability officer. However, further analysis employed additional variables: environmental committee size, diligence, expertise, and knowledge spillover as well as sustainability officer expertise. Several firm characteristics were controlled for including: environmental performance, cumulative number of previous disclosures, cross listing, inclusion on sustainability indices, oil industry, paper industry, petroleum industry, chemical industry, metals industry, CEO duality, institutional ownership, profitability, size, growth and leverage. GHG accounting disclosures were captured from the Carbon Disclosure Project's (CDP) GHG Emissions Questionnaire.

Using a sample of firms participating in the Carbon Disclosure Project (including all US firms in the FT500) from 2002 through 2006, a strong relationship between sustainability-oriented corporate governance characteristics and the voluntary disclosure of GHG information was documented. Specifically, the study found that GHG emission accounting disclosures are positively associated with the

presence of environmental committees on boards of directors and corporate sustainability officers. Further analysis of specific committee and executive characteristics revealed that the size and diligence of the environmental committee and expertise of the sustainability officer are positively related to voluntary disclosure. Committee members with expertise in environmental sustainability were positively associated with disclosure. Finally, knowledge spillover from the overlap between environmental committees and audit committees was found to significantly increase the likelihood of GHG emission accounting disclosures.

Post et al. (2011) evaluated the relationship between boards of directors' composition and environmental corporate social responsibility (ECSR). ECSR was measured in two different ways. First, ECSR disclosures were used as reported in firms' annual reports, corporate environmental reports, corporate websites, and government websites. ECSR disclosure measure comprised 26 items grouped into 3 categories: governance data, credibility data and environmental performance indicators. Second, data from the proprietary KLD STATS database, issued by Kinder, Lydenberg, Domini, Inc. (KLD) that provides annual ratings of the environmental, social and governance actions of more than 3,000 publicly traded companies. KLD measures firms' environmental actions in seven areas of strengths (beneficial products and services, pollution prevention, recycling, clean energy, communications, management systems, and other strengths) and in seven areas of concern (hazardous waste, regulatory problems, ozone depleting chemicals, substantial emissions, agricultural chemicals, climate change, and other areas of concern). Three KLD measures employed in the analyses are: KLD strengths, KLD concerns and Total KLD (the difference between strengths and concerns).

Corporate governance characteristics examined are directors' insider/outsider status, gender, age, and education, while controlling for industry, slack resources and CEO duality. Using a sample of 78 Fortune 1000 companies (consisting of the electronics firms found in the 2006 list of Fortune 1000 companies and the chemical firms found in the 2007 list of Fortune 1000 companies), the study found that a higher proportion of outside board directors is associated with more favorable ECSR disclosures and higher KLD strengths scores. Firms with boards composed of three or more female directors received higher KLD strengths scores. In addition, boards whose directors average closer to 56 years in age and those with a higher proportion of directors with Western European education were more likely to implement environmental governance structures or processes.

Michelon and Parbonetti (2012) investigated the effects of corporate governance, as being represented by three board characteristics (i.e. leadership, structure and composition) on sustainability disclosure, while controlling for some company-specific characteristics. Sustainability disclosure was determined using content analysis of annual, sustainability, social and environmental reports of year 2003 of a sample of 114 European and American companies: 57 are listed in the Dow Jones Sustainability Index and the remaining 57 belong to the Dow Jones between the proportion of independent directors and the quantity of sustainability information disclosed as well as between CEO duality and the level of sustainability disclosure. In addition, the relationship between the presence of a CSR committee or responsible and the level of disclosure is not confirmed by empirical evidence. However, a positive association was found between community influential and sustainability disclosure. Accordingly, the study partially supports the idea that sound governance increases voluntary disclosure.

AbuRaya, 2012 empirically investigated the relationship between corporate governance and the quantity of corporate environmental disclosures in the UK, while controlling for some corporate characteristics as well as an in-depth exploration of quality identification and assessment issues. Based on stakeholder-agency theory, the study's argument is that the quantity of corporate environmental disclosure directed to various stakeholders is enhanced when managers' opportunistic manipulation

is monitored by corporate governance mechanisms, thereby reducing the information expectation gap.

Content analysis of annual reports was conducted for a sample of FTSE-All share companies for the years 2004-2007 inclusive. A checklist of environmental disclosure items and categories is developed and environmental disclosure indices are computed. In doing so, the study distinguishes between the different categories or areas of activity to which environmental disclosure relates including environmental policies, environmental product and process-related, regulatory compliance, environmental auditing, sustainability and other environmentally-related information.

A variety of statistical tests and analyses, including descriptive statistics, correlation analysis and regression analysis, were undertaken to measure the relationship in question. In addition, sensitivity analysis was carried out to check the robustness of the main regression analysis. Descriptive statistics showed that there is a relatively low level of corporate environmental disclosure quantity in the UK.

Results also revealed a significant association between environmental disclosure quantity and most corporate governance mechanisms. Specifically, higher environmental disclosure quantity is associated with lower percentage of independent non-executive directors on the board, separation of the dual role of CEO and chairman, higher frequency of board meetings, greater cross-directorships of board members, presence of board-level corporate environmental responsibility (CER) committee or responsible, lower percentage of independent non-executive directors on the nomination committee and lower ownership concentration. In addition, it appears that other corporate governance mechanisms are significant at some categorical levels of environmental disclosure quantity. In other words, for some disclosure categories, higher environmental disclosure quantity is also associated with higher percentage of directors qualified in business, accounting and/or finance, higher percentage of independent non-executive directors on the audit committee and higher percentage of institutional ownership. Neither board size, community influence nor remuneration committee independence shows a significant association with environmental disclosure quantity, although the positive relationships are mostly in the expected direction, except for board size where a negative relationship is documented.

Khan et al. (2013) examined the relationship between corporate governance and the extent of corporate social responsibility (CSR) disclosures in the annual reports of Bangladeshi companies. The sample consisted of all 135 manufacturing companies listed with Dhaka Stock Exchange (DSE) in Bangladesh from 2005 to 2009. To assess the extent of CSR disclosure, content analysis of annual reports was conducted and a checklist containing 20 items was constructed.

Results suggested that although CSR disclosures generally have a negative association with managerial ownership, such relationship becomes significant and positive for export-oriented industries. Public ownership, foreign ownership, board independence and presence of audit committee were found to have positive significant impacts on CSR disclosures. However, no significant impact of CEO duality was detected. Overall, the study concluded that corporate governance attributes play a vital role in ensuring organizational legitimacy through CSR disclosures.

Chan et al. (2014) investigated the association between the quantity of corporate social responsibility (CSR) and corporate governance. Controlling for industry profile, firm size, stockholder power/dispersion, creditor power/leverage, and economic performance, the study analyzed the annual reports for a sample of 222 listed companies. To enable content analysis to be performed in a replicable manner, a CSR measuring instrument was developed to record CSR disclosures across seven themes.

Corporate governance quality was assessed using the WHK corporate governance report which ranks Australian companies from best to worst on the basis of their performance in six key corporate governance areas: board of directors; audit committee; remuneration committee; nomination committee; external auditor independence; and code of conduct and

other policy disclosures. Results indicated that firms providing more CSR information have better corporate governance ratings, suggesting a link between corporate governance quality and CSR disclosure in company annual reports.

Giannarakis et al. (2014) investigated the effect of corporate governance on the extent of corporate social responsibility (CSR) disclosure in a US context. Two corporate governance variables were investigated; CEO duality and the presence of women on the board. The environmental, social and governance (ESG) disclosure score is used as a proxy for the extent of CSR disclosure calculated by Bloomberg. The influence of plausible variables on the ESG disclosure score and its sub-categories was examined by using the least squares dummy variable model (LSDV) incorporating 100 companies listed on Standard & Poor's 500 Index for the period 2009-2012.

CEO duality and presence of women on board influenced the extent of social disclosure. The high levels of women on board of directors positively affected the extent of social disclosure. Furthermore, it is revealed that the structure of the board leadership tends to affect the extent of social disclosure significantly. In particular, a CEO duality condition tends to decrease the level of social information indicating poor CSR governance.

Liao et al. (2015) examined the impact of corporate board's characteristics on the voluntary disclosure of greenhouse gas (GHG) emissions in the form of a Carbon Disclosure Project report. The dependent variable is a proxy for carbon disclosure propensity. Using both univariate and regression models with a sample of FTSE350 companies in the United Kingdom the study found a significant positive association between gender diversity (measured as the percentage of female directors on the board) and the propensity to disclose GHG information as well as the extensiveness of that disclosure. In addition, a board with more independent directors or environmental committee shows a higher tendency to be ecologicalty transparent.

Habbash (2016) examined corporate social responsibility (CSR) disclosure practices and the potential influence of corporate governance (CG), ownership structure and corporate characteristics in an emerging Arab country, Saudi Arabia. The study developed a checklist comprising 17 disclosure items of CSR based on ISO 26000. The study examined 267 annual reports of Saudi Arabian non-financial listed firms during 2007-2011 using manual content and multiple regression analyses and a checklist of 17 CSR disclosure items based on ISO 26000. The analysis showed that government and family ownership are positive determinants of CSR disclosure, while effective audit committee, board independence, role duality and institutional ownership are not determinants of CSR disclosure.

Lone et al. (2016) examined the extent of corporate social responsibility (CSR) disclosure in Pakistani companies after the introduction of CSR voluntary guidelines in 2013 by Securities and Exchange Commission of Pakistan (SECP) and the effect of corporate governance elements on CSR disclosure. The study used content analysis method to measure the extent of CSR disclosure in annual and sustainability reports of 50 companies from eight different sectors from 2010 to 2014. An index was used to measure the extent of CSR disclosure. The index covers seven broader activities of CSR, namely, contribution to the health sector, natural disaster, employee welfare, education sector, product and services, environmental issues and other donations.

The relationship between corporate governance elements and CSR disclosure was analyzed using regression analysis and applying the random effects model. The level of CSR disclosure in Pakistani companies has increased after the introduction of CSR guidelines. The results also revealed that board size exerts a significant positive effect on CSR disclosure. The presence of women directors on board positively affected the extent of CSR disclosure. It was also found that independent directors positively affect CSR disclosure.

Vogt et al. (2016) aimed at analyzing the relationship between determinant factors of disclosure of information on environmental impacts of Brazilian companies. Corporate Sustainability Index and Corporate Governance were collected on the website of BM&

FBovespa. A descriptive, documental and quantitative research was conducted through a sample of 97 Brazilian companies listed on the Stock Exchange of São Paulo, belonging to the IBrX-100 index in the period between 2010 and 2013. In the Sustainability Reports and in the Annual Reports information, five environmental aspects were collected: emissions, effluents, wastes, products and services, and transport, which were used to measure the degree of environmental disclosure. The study concluded that there was no evidence that Governance positively influences the degree of disclosure. Only in 2010, there was some influence, however, negative.

2.2. Examining the Relationship between Environmental Disclosure Quality and Corporate Governance

Adams (2002) examined the internal contextual factors and their impact on corporate social and ethical reporting. The internal contextual factors considered include aspects of the reporting process and attitudes to reporting, its impacts, legislation and audit. Process variables included corporate structure and governance procedures, extent and nature of stakeholder involvement, and extent of involvement of accountants. Attitudes variables included views on recent increase in reporting, reporting bad news, reporting in the future, regulation and verification, perceived costs and benefits of reporting and corporate culture. Interviews were carried out with three British companies and four German companies during 1998. All the companies were in the chemical and/or pharmaceutical business and were amongst the largest 400 companies listed in The Times 1000 (1995).

A key finding of this study is that there are significant internal contextual variables which are likely to impact on the extensiveness, quality, quantity and completeness of corporate social and ethical reporting. The study found that the process of reporting appears to depend on country of origin, corporate size and corporate culture. Aspects of process which appear to be influenced by these variables are the degree of formality versus informality, the departments involved and the extent of engagement of stakeholders. Accountants were found to be neither involved in data collection nor considered appropriate people to be involved. The attitudes of interviewees were also likely to have an influence on the extent and nature of reporting. For example, the main motivation for corporate ethical reporting was to enhance corporate image and credibility with stakeholders. Public pressure was an important reason for developments and changes in reporting practice. Further, there was a general agreement that reporting bad news enhances corporate credibility and image. Finally, attitudes to audit vary between companies, with some companies not having an audit and others having audits of only limited scope.

Cormier et al. (2005) suggested a multi-tiered theoretical framework that views a firm's decision to provide environmental disclosure as reflecting its responsiveness to different levels of influence: financial stakeholders' information needs, society's environmental concerns which translate into public pressures and institutional constraints and processes which could be either company - or country - specific. Environmental disclosure is measured using a coding comprising thirty-nine items that are grouped into six categories: environmental expenditures and risks, laws and regulations, pollution abatement, sustainable development, land remediation and contamination (including spills), and environmental management. Quality rating is based on a score of one to three: three for an item described explicitly in monetary or quantitative terms, two when an item is described specifically and one for an item discussed in general.

The influence of the following variables were examined: information costs (as captured by risk, reliance on capital markets, trading volume, concentrated ownership and foreign ownership); financial condition (as captured by market return and leverage); and media pressure (as proxied by media exposure). In addition, the study controlled for fixed assets age, firm size and SEC registrant. Environmental disclosure quality was analyzed during the 1992–1998 period among a sample of 55 of the large German firms that comprise the DAX 30/DAX 70 indices.

Results indicated that information costs, as proxies by risk and ownership, are potentially

important determinants of environmental disclosure strategy. Moreover, environmental disclosure quality was related to media pressure, while there was no relation between financial condition and environmental disclosure. Results also showed that environmental disclosure quality is conditioned by industry membership. In addition, fixed assets, age and firm size determined the level of environmental disclosure by German firms in a given year. Finally, consistent with institutional theory predictions, there was evidence that imitation and routine determine environmental disclosure quality. Overall, results strongly suggest that environmental disclosure is multidimensional and is driven by complementary forces.

Brammer and Pavelin (2006) examined the patterns in voluntary environmental disclosures made by a sample of large UK companies. The analysis distinguished between the decision to make a voluntary environmental disclosure and decisions concerning the quality of such disclosures, examining how each type of decision is determined by firm and industry characteristics. Disclosure data were obtained from the "PIRC Environmental Reporting 2000" survey. The PIRC is an independent research consultancy that conducts the most comprehensive study of environmental disclosure by listed companies in the UK. They identify six indicators of the quality of corporate environmental disclosure: disclosure of an environmental policy; existence of board-level responsibility for environmental matters; the description of environmental initiatives; reporting on environmental improvements; setting of environmental targets; and the presence of an environmental audit or assessment.

Disclosure quantity is a dichotomous variable depending on whether or not a company participates in any of the six components of environmental disclosure identified in the PIRC's report, while disclosure quality is the number of the aspects identified by the PIRC apparent in the disclosure of each company. The initial sample of the study was FTSE All Share comprising approximately 700 companies while the final sample consisted of 447 companies. Probit and Ordered Probit methods of estimation were used for the models developed concerning the quantity and quality of environmental disclosures respectively.

Results of the regression analysis revealed that industries with highly visible environmental issues and firm size have a highly significant positive effect on the likelihood that companies make environmental disclosures, and that highly leveraged companies are significantly less likely to make such disclosures. A significant negative relationship was found between the size of the largest shareholding in a company and the probability of environmental disclosure, while no significant relationship existed between the likelihood of making environmental disclosure and profitability, environmental performance, media visibility or the number of non-executive directors. Concerning the quality of environmental disclosures, there existed strong evidence of cross-sector variation with higher quality disclosures for environmentally-sensitive industries, significant positive relationship to firm size and environmental performance, significant negative relationship to both leverage and the size of the largest shareholding and no significant role for media visibility, current profitability or the number of non-executive directors.

Boesso and Kumar (2007) examined what factors in addition to the needs of financial markets drive voluntary disclosure practices – including those of environmental disclosure – of companies in Italy and in the United states. Information provided in the management discussion and analysis section of the annual reports of 72 companies was content analyzed for 2002 to determine the volume and the quality of voluntary disclosures. The sample companies were chosen from companies listed on the Milano-Mercato Ordinario and the New York stock Exchange; 36 companies have received awards for the quality of their corporate communication and 36 companies have not.

Seven specific perspectives were identified as a framework for the study including investor, employee, customer, supplier, social and environmental, internal processes and innovation and leaning. Key performance indicators were identified for each of the

seven perspectives and actual performance was captured using content analysis technique. Actual disclosures were classified according to the type of information (qualitative and quantitative), nature of information (financial and non-financial) and information on outlook (forward looking and historical). An index of disclosure quality was then developed by assigning different weights to different types of information. Factors examined were categorized as those related to investors' information needs (business complexity and industry instability & volatility) and within–company factors (corporate governance, stakeholder engagement, and intangible asset management). Moreover, company size and industry membership were controlled for in the study.

The relationship was examined using the Ordinary Least Square (OLS) regression technique. Results provided some support to the effect that factors related to investors' information needs (business complexity and industry instability & volatility) influence the volume of voluntary disclosures. However, these factors appeared to have little impact on the quality of voluntary disclosures. Results also showed that factors such as company emphasis on stakeholder management and relevance of intangible assets affect the quality of voluntary disclosures in the case of Italian companies but not in case of USA companies. In addition, the results confirmed that company size, and to a lesser extent the industry in which the company operates, influences voluntary disclosures made by companies.

Brammer and Pavelin (2008) examined the patterns in the quality of voluntary environmental disclosures made by a sample of 477 large UK companies drawn from a diverse range of industrial sectors. The analysis distinguishes between five facets of quality of corporate environmental disclosure: disclosure of environmental policy, the description of environmental initiatives, reporting on environmental improvements, settings of environmental targets, and the presence of an environmental audit or assessment. The study examined how the decisions firms face, regarding each facet of quality, are determined by firm and industry characteristics. Data concerning environmental disclosures were obtained from the PIRC Environmental Reporting 2000 survey. The PIRC is an independent research consultancy that conducts the most comprehensive study of environmental disclosure by listed companies in the UK.

Quality was hypothesized to be driven by the nature of a firm's business activities, its environmental performance, organizational size, media visibility and financial resources and the composition of both ownership and the main board. Logit estimation method was used and logit regressions were run with and without cross-sector variation. Results found the quality of environmental disclosure to be determined by a firm's size and the nature of its business activities. High quality disclosures were primarily associated with larger firms and those in sectors most closely related to environmental concerns. In contrast to several recent contributions, results indicated that the media exposure of companies plays no role in stimulating voluntary environmental disclosure.

O'Sullivan et al. (2008) investigated the role played by a firm's corporate governance framework in the decision to voluntarily disclose forward-looking information in the published financial reports of Australian companies in 2000 and 2002. The 2000 and 2002 published annual reports were examined for the largest 300 publicly listed firms according to net profit for the year 2000, as identified in the Business Review Weekly (BRW). Voluntary disclosure of forward-looking information was recognized provided the projection could be classified in terms of the following four characteristics: direction (up, down or no change); type (income/profit, cash flow, sales/revenue); location (Directors' Report, CEO's/Managing Director's Report, Review of Operations, Chairman's Report, D&A and other); and nature (qualitative, quantitative).

The first corporate governance category, board autonomy, reflects board independence, the absence of a dominant personality within the firm, the independence of the chair and non-executive director shareholdings. The second category relates to board committees and is comprised of the presence and independence

of a compensation committee, as well as the appointment of a nomination committee. The next category considers the ownership structure prevalent within the firm including institutional ownership, block shareholdings and concentration of shareholdings. The final measure of corporate governance pertains to the audit function including the appointment of an audit committee, its independence, frequency of its meetings, audit firm size and auditor independence. A summary measure of corporate governance, which takes into account values calculated for the categories was developed. In addition, the study controlled for firm size, performance, information environment and leverage.

Logistic regression analysis was employed. With respect to the year 2000, the corporate governance category, audit quality, consisting of the presence and independence of the audit committee, its meeting frequency, the use of a big 6 auditor and the auditor's independence, were positively associated with the disclosure of forward-looking information. The corporate governance category, board committees, consisting of the appointment and independence of a compensation committee and the creation of a nomination committee, and the overall efficacy of the corporate governance system were also positively associated with the disclosure of forward-looking information. However, results revealed that corporate disclosure did not seem to be driven by the same factors in 2002 since in that year none of the governance categories was significantly associated with the firm's decision to publish forward-looking information in financial reports.

Prado-Lorenzo et al. (2009) tested a stakeholder theory approach to analyzing corporate social disclosures and examined the effect that shareholder power and dispersed ownership structure have on the decision to disclose corporate social responsibility (CSR) information in the Spanish context. The study analyzed the level of contents, their quality and their objectivity through compliance with the rules for preparation of the GRI model. It also took into account whether the fulfillment of these rules has been certified by the GRI organization, and whether the data reflected have been verified or audited by entities independent of the firm. The variables examined included the presence of a financial institution in the corporate ownership structure, the presence of a physical person that represents a dominant shareholder and the number of independent directors. Several factors have been controlled for, including government power (size, transport and communications sector, industrial sectors, energy sector and construction sector); creditors' power (debt-to-equity ratio); strategic posture (ISO14001 certification and OHSAS18001 certification) and economic performance (ROA).

The empirical results, based on a sample of 99 non-financial Spanish firms quoted on the Spanish continuous market, revealed only a limited association between the presence of a physical person that represents a dominant shareholder and corporate social disclosures. Results confirmed that the influence exerted by certain stakeholders (government and creditors), together with the strategic posture of the firm, had an important effect on the publication of a CSR report. On the contrary, economic performance had a null effect on this process. From the point of view of the shareholders, especially in an ownership structure defined by the presence of a main shareholder that exerts control over the firm, there was encouragement to adopt the GRI format as a CSR reporting model to be used by the firm for disclosing information. In contrast, financial institutions, investors that are unable to move funds quickly in and out without affecting share price, and dispersed shareholders seemed to be only interested in the financial performance of the firm, but not in its sustainable strategies or activities.

Hassan (2010) investigated the impact of several factors on both the quantity and quality of corporate social disclosure in annual reports as well as stand-alone reports. The factors examined were classified as corporate characteristics (corporate size, type of activity, profitability and multinationality); media pressure; and corporate governance (board size, board composition, presence of social responsibility committee and block ownership). With respect to the annual reports, the quantity

of corporate social disclosure was measured by the number of sentences, while the disclosure quality was measured using a two-point ranking system with value 1, for quantity and specific disclosure, and value 0, for general disclosure. However, in case of stand-alone reports, the quantity of corporate social disclosure was measured by the number of report pages, while the disclosure quality was measured as a two-point dummy variable, according to which a report is audited or not and prepared using reporting guidelines or not.

The study analyzed a sample of companies comprising FTSE 100 and FTSE 250 for the years 2005 and 2006. Empirical analysis indicated that corporate social disclosure is associated with corporate size, industry, media pressure, board size, corporate social responsibility committee and ownership diffusion. However, results suggested that these factors are more associated with the quantity of disclosure than its quality. An exception is media pressure which was not associated with the quality of corporate social disclosure.

Rupley et al. (2011) investigated the relationship between specific aspects of multis takeholder governance and the quality of voluntary environmental disclosure. Four related measures of environmental disclosure quality employed were compliance, pollution prevention, product stewardship and ecological sustainability. These environmental strategies move progressively from the lowest quality level of compliance to the highest quality level of sustainable development, implying - as argued by the authors - an increasing integration of environmental stewardship into organizational culture. A disclosure index, initially based on the Global Reporting Initiative's (GRI) framework, was used to capture the strategic implications of environmental behavior.

Environmental disclosure data were collected from both firms' stand-alone corporate reports and annual or 10-K reports. The study examined the role of environmental legitimacy (as proxied by environmental media coverage), the influence of institutional investor ownership (including both long-horizon and short-horizon institutional ownership) and the influence of multi-stakeholder governance (including board independence, gender diversity, multiple directorships, separation of the CEO from the board chair position and the existence of a corporate social responsibility committee). Moreover, the study controlled for firm size, profitability, industry sensitivity, regulation sensitivity and presence of a separate corporate environmental report.

Based on a sample of 127 US firms drawn from the Dow Jones Global Index over a three-year period (2000, 2003 and 2005), the final data set included 361 firm-year observations. The sample firms were drawn from five industries; chemical, oil and gas, electrical utilities, pharmaceutical and biotech and food and beverage. Using univariate and regression analyses, results suggested that voluntary environmental disclosure quality is positively associated with board independence, gender diversity, and multiple directorships while negatively associated with environmental media. In addition, the percentage of directors serving on multiple boards is positively related to three levels of voluntary environmental disclosure quality individually examined (i.e. compliance, pollution prevention and product stewardship) and board independence and diversity are each positively related to at least one level of voluntary environmental disclosure quality.

Cormier et al. (2011) examined the informational contribution of social and environmental disclosures for investors. The study investigated whether social disclosure and environmental disclosure quality have a substituting or a complementing effect in reducing information asymmetry between corporate managers and stock market participants. The factors examined as possible determinants of social and environmental disclosures were environmental performance, free float (ownership dispersion), analyst following, leverage, profitability, firm size, board independence, board size, audit committee size and environmental media exposure.

Environmental disclosure items grouped into two broad dimensions. On one hand, there is disclosure about environmental debts, risks and litigations, which captures four components of the content grid: expenditure

and risk; compliance with laws and regulations; pollution abatement; and land remediation and contamination. On the other hand, there is disclosure about environmental management practices that relates to sustainable development and environmental management grid captions. The quality rating is based on a score from one to three. Three points are awarded for an item described in monetary or quantitative terms, two are awarded when an item is described specifically (qualitative), and one is awarded for an item discussed in general (indicative).

The sample comprised 137 large Canadian companies included in Toronto Stock Exchange S&P/TSX Index for the year 2005. Using regression analysis, results of the regression coefficients indicated that environmental performance, environmental news exposure and firm size are key drivers of both environmental and social disclosures. Analyst following, board size and, to a lesser extent, leverage are significantly related to environmental disclosure. However, no significant relationship is detected between the quality of environmental disclosures and each of free float (ownership dispersion), profitability, board independence and audit committee size.

Marshall et al. (2011) examined the association between specific aspects of corporate governance and the quality of voluntary environmental information disclosed by firms. Three specific governance related factors examined are institutional investor type (including both long-horizon and short-horizon institutional ownership), shareholder proposal outcomes (including withdrawn, disqualified and voted) and board composition (including external board representation). The study employed a sample of 183 firms drawn from five industries (chemicals, oil and gas, utilities, pharmaceutical and biotech, and food and beverage) from the Dow Jones Global index over a three-year period (2000, 2001 and 2002). Four related measures of environmental disclosure quality were used: compliance, pollution prevention, product stewardship and ecological sustainability. An index of disclosure quality based on four progressive levels of environmental strategy and management was developed. Disclosure items were grouped into eight different forms of disclosure relating to the four levels of environmental strategy. Environmental disclosure data were collected from both firms' stand-alone corporate reports and annual or 10-K reports. The study controlled for firm size and profitability.

Results indicated no evidence of a relation between pension fund equity percentage or long-horizon institutional ownership and any of the measures of voluntary environmental disclosure quality. However, investment fund equity or short-horizon institutional ownership was negatively related to all four levels of disclosure. The study also documented a consistently positive relationship between withdrawn resolutions and the quality of voluntary environmental disclosure in terms of compliance, pollution prevention and product stewardship. While resolution disqualification was found to be marginally significant and positively related to only product stewardship level of voluntary environmental disclosure quality, the study was unable to document a relation between the number of resolutions that are ultimately voted on and any of all four levels of disclosure. Board composition was unrelated to all four measures of voluntary environmental disclosure quality. Nevertheless, firm size and profitability were significantly and positively related to all four measures of voluntary environmental disclosure quality.

AbuRaya (2012) empirically investigated the relationship between corporate governance and the quality of corporate environmental disclosures in the UK, while controlling for some corporate characteristics as well as an in-depth exploration of quality identification and assessment issues. Based on stakeholder-agency theory, the study's argument is that the quality of corporate environmental disclosure directed to various stakeholders is enhanced when managers' opportunistic manipulation is monitored by corporate governance mechanisms, thereby reducing the information expectation gap.

Content analysis of annual reports was conducted for a sample of FTSE-All share companies for the years 2004-2007 inclusive. A broadly defined disclosure quality index in line with the international accounting standards

framework, that captures the distinct nature of disclosure items and that distinguishes the different types of information content, was developed. It comprises comparability, understandability, relevance, and reliability of environmental disclosures. 'Comparability' is permitted with the financial quantification of information that can be elaborated through non-financial quantification and descriptive forms. 'Understandability' is facilitated when the economic direction or sign of information is clear. 'Relevance' is achieved via the provision of forward-looking information in addition to historical information. 'Reliability' is assured through verification or auditing.

A variety of statistical tests and analyses, including descriptive statistics, correlation analysis and regression analysis, were undertaken to measure the relationship in question. In addition, sensitivity analysis was carried out to check the robustness of the main regression analysis. Descriptive statistics showed that there is a relatively high level of corporate environmental disclosure quality in the UK.

Results also revealed a significant association between environmental disclosure quality and most corporate governance mechanisms. Specifically, higher environmental disclosure quality is associated with the separation of the dual role of CEO and chairman as well as with higher frequency of board meetings. In addition, it appears that other corporate governance mechanisms are significant at some categorical levels of environmental disclosure quality. In other words, for some disclosure categories, higher environmental disclosure quality is also associated with lower percentage of independent non-executive directors on the board, lower percentage of community influential directors, greater cross-directorships of board members, presence of board-level corporate environmental responsibility (CER) committee or responsible, higher percentage of independent non-executive directors on the audit committee, lower percentage of independent non-executive directors on the remuneration committee, lower percentage of independent non-executive directors on the nomination committee, lower percentage of ownership concentration and higher percentage of institutional ownership. Neither board size nor directors' education show a significant association with environmental disclosure quality, although the positive relationship is in the expected direction for education, but not for board size where a negative relationship is documented.

Iatridis (2013) investigated the relation between environmental disclosure quality and corporate governance and also examined the extent to which effective environmental disclosures are value relevant and how they influence investor perceptions. The study examined 529 Malaysian companies listed on Bursa Malaysia, formerly known as Kuala Lumpur Stock Exchange. The period of investigation is 2005 to 2011. The research hypotheses were tested using the OLS regression analysis. This study designed an environmental disclosure index in order to compute an environmental score for each sample company. The scoring index was based on the GRI guidelines consisting of the following categories: (1) governance structure and management systems, (2) credibility, (3) environmental performance indicators, (4) environmental spending, (5) vision and strategy claims, (6) environmental profile, and (7) environmental initiatives.

The findings of the study showed high quality environmental disclosers display effective corporate governance and would tend to face less difficulty in accessing capital markets. The findings showed that the environmental disclosure is positively associated with the percentage of independent directors sitting on the board of directors, the percentage of independent directors sitting on the audit committee of the board and the presence of an audit committee. Similar considerations would hold for companies audited by a big 4 auditor or cross-listed on foreign stock exchanges and display significant levels of managerial and institutional ownership. High quality environmental disclosures are value relevant and improve investor perceptions.

Mallin et al. (2013) investigated the effects of the corporate governance model on both the extent and the quality of social and environmental disclosure. The study analyzed

the disclosures of the 100 U.S. Best Corporate Citizens in the period 2005-2007. Social and environmental disclosure was measured in two ways. First, a measure of disclosure was employed consistent with the reporting framework of the GRI standards including 121 sustainability disclosure items. Second, a measure for the quality of disclosure was employed including quantitative or financial information as three points, disclosures with company-specific information in a non-quantitative form as two points, and items disclosed in only general form as one point.

Empirical evidence showed that the stakeholders' orientation of corporate governance was positively associated with social and environmental disclosure. Ownership concentration appears to be significantly and negatively correlated with the quality disclosure score. No significant correlations were found between the proportion of shares held by investment institutions and measures of disclosure. The presence of pensions funds was positively correlated with disclosure quality. Results also found evidence of significant correlations between board variables and measures of disclosure. The proportion of community influentce was significantly and positively correlated to all the measures of disclosure, while no significant associations were found between the proportion of women directors and disclosure quality. The average number of directorships was positively related to the extent of disclosure. The community and environmental performance was significantly and positively associated with measures of disclosure quality, suggesting that amongst the Best Corporate Citizens, the best performers are those more likely to present disclosures of higher quality. Human rights performance was negatively related to the disclosure quality measure.

Jizi et al. (2014) examined the relationship between corporate governance and corporate social responsibility (CSR) in the banking sector. Particular reference was made to the role of board of directors and its impact on the quality of CSR disclosure in US listed banks' annual reports after the US sub-prime mortgage crisis. Using a sample of 107 US listed national commercial banks for the period 2009-2011, annual reports were content analyzed for four CSR categories: community involvement, environment, employees, and product and customer service quality.

Each CSR category is rated from zero to three according to the richness of information disclosed. One additional point is given per category if quantitative figures are disclosed and another point if comparative figures are disclosed. Results indicated that board independence and board size, the two board characteristics usually associated with the protection of shareholder interests, are positively related to CSR disclosure. CEO duality also impacted positively on CSR disclosure.

Ntim (2016) investigated the impact of corporate governance on social and environmental accounting with specific focus on corporate health accounting. The sample was based on 573 non-financial corporations listed on the national stock exchanges of Ghana, Kenya, Nigeria, South Africa, and Zimbabwe, with complete data for the years 2005, 2007, 2009, 2011, and 2013, chosen from five industrial sectors. The study measured quality by a disclosure index, containing 50 disclosure items of corporate health accounting disclosures covering four broad areas as set out by 2003 GRI's reporting guidance: (i) good governance; (ii) measurement, monitoring, and evaluation; (iii) workplace conditions and HIV/AIDS management; and (iv) depth, quality, and sustainability of disclosure programs. A content analysis technique of coding narratives, graphs, pictures, and numbers into different themes and patterns was employed in collecting the social and environmental accounting data. An index was developed for corporate governance containing 4 major parts: (i) directors and boards; (ii) accounting, auditing, disclosure, and transparency; (iii) internal audit, risk management, and control; and (iv) compliance, shareholder rights, and enforcement. Alternative corporate governance variables are block shareholding, board size, gender diversity within the board of directors, government shareholding, independent non-executive directors, and institutional shareholding.

Results indicated that companies that are better-governed tend to engage in increased

social and environmental disclosures. In other words, board size, board gender diversity, government shareholding, and independent NEDs were positively related to social and environmental disclosures, while block shareholding and institutional shareholding were negatively associated with social and environmental disclosures.

3. Discussion and Analysis

Corporate environmental reporting has been widely discussed by academic research for more than four decades. The development of environmental accounting and reporting has created a space for the researchers to study how organizations can benefit from this interaction with the society, i.e. the value relevance of environmental activities (Gray, 2010). With the growing importance of the environmental issues in the business transactions, companies started implementing a focused strategic management approach in environmental practices (Roy and Ghosh, 2011). These corporate practices induce researchers to quantify the value relevance of this environmental management system.

A considerable body of literature from a wide range of theoretical backgrounds concluded that environmental disclosures are an important phenomenon employed by corporations (Gray et al., 2001) and are influenced by a variety of explanatory factors. Adams (2002) indicated that an understanding of the factors which influence disclosure is necessary for improving accountability and specifically: (1) the extensiveness of reporting, (2) the quality and quantity of reporting by individual companies, (3) the completeness or comprehensiveness of reporting, and (4) the disclosure of critical analysis of the potential role of legislation in achieving improvements in the previous areas.

However, the assessment of environmental disclosures quality remains a rather controversial issue. Several attempts have been made in the accounting literature to measure disclosure quality. Two approaches of quality assessment commonly employed are the use of subjective analyst disclosure quality rankings and the use of researcher-constructed disclosure indices (Beatti et al., 2004). Each of the two approaches, and even the different measures developed under each approach, may have their respective strengths and weaknesses in capturing the necessary data for addressing stakeholders' interests and satisfying their information needs. Nevertheless, the growing importance of narrative disclosures in financial reporting gives the question of disclosure quality measurement a different perspective, while bearing in mind that disclosure quantity generally has an implication in determining disclosure quality (Beretta and Bozzolan, 2008). Such a perspective shifts the issue of disclosure quality from volumetric measurement to semantic assessment. This shift in disclosure quality assessment is argued to have the advantages of permitting the benchmarking of current disclosure practices, allowing comparisons to be made among different companies, industries and countries and allowing changes over time to be monitored as well as permitting more powerful investigation of narrative disclosure issues (Beatti et al., 2004).

Prior literature regarding the relationship between corporate environmental disclosure and each of corporate governance mechanisms and corporate characteristics suffers from a number of limitations that contribute to the inconsistency (Belkaoui and Karpik, 1989; Gray et al., 1996; Orlitzky et al., 2011) and inconclusiveness (Ahmed and Courtis, 1999) of existing findings. While these studies draw conclusions as to organizations' environmental commitment based largely on the amount of disclosure, they rarely considered the actual content of what is being disclosed. Overcoming the limitations inherent in previous studies would significantly enhance research in this area. Following is a detailed analysis and critical evaluation of empirical studies investigating the impact of corporate characteristics and corporate governance mechanisms on the quantity and quality of corporate environmental disclosure. Analysis of previous studies is aimed at identifying any gaps in the literature and, accordingly, suggesting some prospects for future research.

First, and most important, is the limited prior research specifically investigating the relationship between each of the quantity and the quality of corporate environmental

disclosure and corporate governance. Although previous research has acknowledged that good corporate governance is associated with increased transparency and credible disclosure (see Ajinkya et al., 2005; Cormier et al., 2010; Dunstan, 2008; Gul and Leung, 2004), little attention has been dedicated to the impact of corporate governance mechanisms on environmental disclosure practices. Prior empirical studies into factors which are influential in determining the extent and quality of corporate social and environmental reporting has primarily been concerned with the impact of corporate characteristics (such as size, industry grouping and financial performance) or general contextual factors (such as the social, political and economic context), while relatively little prior work has examined the internal contextual factors (corporate governance mechanisms) influencing disclosure practices (Adams, 2002).

The principles of corporate governance established by the Organization for Economic Cooperation and Development (OECD) set out a framework for good practice, and constitute a set of voluntary recommendations for corporations in all the major areas of business ethics, including environment and information disclosure. A company implementing OECD guidelines on corporate disclosure should consider undertaking a certain amount of environmental reporting (OECD, 2004). Accordingly, corporate governance plays an important role in determining the disclosure required for satisfying the information needs of various stakeholders as it is the board of directors that manages information disclosure in annual reports (Gibbins et al., 1990; Haniffa and Cooke, 2005). Hence, it is possible that failure to include corporate governance characteristics could account for the inconsistency and inconclusiveness characterizing the results of corporate social and environmental disclosure studies (Gul and Leung, 2004).

In addition, the majority of previous studies have adopted an aggregated view of environmental disclosures rather than disaggregating disclosures into main themes or categories (Campbell, 2004). Although these studies included some sort of classification scheme of environmental disclosures, they did not separately identify such disclosure groupings or individually incorporate them into empirical analyses (see for example, Brammer and Pavelin, 2006; Deegan and Gordon, 1996; Deegan and Rankin, 1996; García-Ayuso and Larrinaga, 2003; Post et al., 2011; Stanny and Ely, 2008). While a composite or summary measure, that collapses different disclosure categories into a single value, is useful in associating disclosure quantity with other variables of interest, the analysis of the different disclosure categories provides deeper understanding of and richer insights into disclosure quantity (see Beattie et al., 2004), thereby helping to comprehensively profile the disclosure strategies adopted by the company (Beretta and Bozzolan, 2004). Aggregated measures shift attention away from what is and what is not being reported in terms of the different themes or items being reported (Chapman and Milne, 2004).

There is no prior research to date into the relationship of corporate environmental disclosure and corporate governance that uses comprehensive governance indicators or that thoroughly examines the relationship in a complete manner (except for few, see for example AbuRaya, 2012). These studies have been limited to the effects of firm ownership and board structure as explanatory factors. More specifically, they examined different ownership forms, the proportion of independent directors, board size, role duality and the existence of an audit committee. According to Ho and Wong (2001) however, disclosure analyzed the effect of one single corporate governance attribute and very few of them examined different governance attributes in a single study (e.g. Haniffa and Cooke, 2002; Rupley et al., 2011). Based on the idea that the corporate governance system is the result of a series of interrelated characteristics, all of which are relevant to ensure sound governance, environmental disclosure should be analyzed in the context of a collection of corporate governance mechanisms. Conducting extensive field work is thus important to better understand, document and operationalize corporate governance variables (Zahra and Pearce II, 1989).

Although some studies have examined the relationship between corporate environmental

disclosure and corporate governance, very few of them have conducted a comparative study across different countries (see Ntim, 2016). The findings of the studies conducted in certain countries cannot be generalized to all countries. There are quite striking differences across countries. Differences exist with respect to culture; accounting systems; banking and finance systems; government and legislative systems; and the attitudes of society towards the legitimate roles of companies and the extent to which they should be held responsible for the environmental impacts of their activities (Gray et al., 1996; Guthrie and Parker, 1990; Patten, 1995). It is therefore considered useful to expand corporate environmental responsibility disclosure literature by providing further evidence on the relationship between corporate governance mechanisms and environmental disclosure practices through a comparative study across different countries.

A second major criticism of previous literature on corporate environmental responsibility disclosures is that the results tend to be inconsistent and/or inconclusive. Inconsistency may be attributed to (a) a lack of theory, (b) diversity of empirical databases examined and (c) the absence of a single conceptual framework to analyze the required relationships (Belkaoui and Karpik, 1989). A major flaw lies in the lack of any explicit comprehensive environmental responsibility theory underpinning the analysis performed and sufficient to explain why corporations engage in social responsibility endeavors (Roberts, 1992). The probability of still insufficiently specified theories exist (Gray et al., 2001). The diversity of empirical databases examined refers to the use of different samples of firms, the focus on different years and different time spans, the use of different control variables, and the use of different dimensions and proxies for the dependent and independent variables (Gray et al., 1996). Finally, failure to analyze the required relationships within a single conceptual framework contributes to the diversity of the results. Research on corporate social responsibility lacks a dominant paradigm because different researchers have heterogeneous backgrounds and thus are influenced by different values and ideologies (Orlitzky et al., 2011).

Inconclusiveness of previous research showing controversial and mixed results may be attributed to several reasons including differences in socio economic and political environments between countries, organizational structures, construction of the informational items in disclosure indices and sampling error (Ahmed and Courtis, 1999). An example would be the mixed evidence that board structure affects environmental disclosure. Halme and Huse (1997) found that board of director factors are positively related to differences in corporate environmental reporting. Barako et al. (2006) found that board composition is negatively associated with voluntary environmental disclosure as did Haniffa and Cooke (2005). However, Brammer and Pavelin (2006) found no significant relationship at all between the likelihood of making voluntary environmental disclosure and the number of non-executive directors. In fact, the few studies in this area have provided counterintuitive and unexpected results (Cheng and Courtenay, 2006). Existing evidence regarding the influence upon the propensity for firms to make voluntary environmental disclosures suffers from well-known limitations (Patten, 2002; Ullmann, 1985) that contribute to the inconclusiveness of existing findings (Gray et al., 2001). These limitations concern the dimensions, types and proxies of each of the dependent variables and independent variables, the different control variables and their proxies, the sample size and type, the years and time spans, and the method of estimating relationships.

Most earlier studies used the volume of disclosure as the dependent variable (Cowen et al., 1987; Patten, 1991; Haniffa and Cooke, 2002; Halme and Huse, 1997, Gul and Leung, 2004; Huafang and Jianguo, 2007) instead of a scoring system (Magness, 2006). While volume of discussion may reflect the emphasis management places on a particular topic, it fails to capture the subtle issues inherent in management strategy (Neu et al., 1998). Focusing on the quantity of disclosures, however, does not mean that such disclosures are of higher quality so as to reflect the true state of the company's disclosure

strategies (Ho and Wong, 2001). Hence, more disclosures do not necessarily imply more quality disclosures. Even most of the few studies that differentiated between the quantity and quality of disclosures (e.g. Magness, 2006; Mio, 2010) did not employ corporate governance characteristics as explanatory variables of environmental disclosures. Still the very few studies investigating the quality of environmental disclosure and incorporating corporate governance measures into the analysis (e.g. Brammer and Pavelin, 2008) failed to explicitly distinguish between the qualitative characteristics of the information disclosed (except for AbuRaya, 2012).

Another point to be considered in the quantity versus quality issue of environmental disclosures would be the independent focus upon each individual indicator of quality rather than an aggregated measure of quality. This would permit insight into whether indicators are complements or substitutes, as well as revealing the extent to which each is associated with particular corporate governance characteristics (Brammer and Pavelin, 2006). Therefore, a more refined and detailed measure and classification base that distinguishes between various degrees and dimensions of environmental reporting should be used. The analysis of the different quality dimensions provides deeper understanding of and richer insights into disclosure quality (see Beattie et al., 2004), thereby helps to comprehensively profile the disclosure quality strategies adopted by the company (Beretta and Bozzolan, 2004).

Previous studies are often criticized for their samples. The samples analyzed have tended to be small and homogeneous. In other words, the samples included a small number of companies to be examined and restricted in diversity in both the size of the companies and their industrial composition (Brammer and Pavelin, 2006). Such samples ignore the contribution of boards in different types of firms to corporate performance (Zahra and Pearce II, 1989) and, hence, to disclosure practices. Specifically, empirical studies have focused upon the largest companies (e.g. Adams, 2002; Gray et al., 2001; Guthrie and Parker, 1990), or those companies belonging to environmentally sensitive or high profile industries (e.g. Freedman and Jaggi, 1988; Gamble et al., 1995; Neu et al., 1998). The results of such studies are therefore less reliable and certainly cannot be generalized over the whole population. Accordingly, the use of a large and industrially diverse sample permits a more comprehensive exploration of the impact of the different corporate governance characteristics upon corporate environmental disclosures.

In addition, the importance of time seems to be overlooked in existing literature. Almost all prior studies examining the determinants of corporate environmental disclosure are mainly cross-sectional in nature investigating the relationship over one year only (e.g. Adams, 2002; Brammer and Pavelin, 2006) except for very few studies (e.g. AbuRaya, 2012; Barako et al., 2006; Campbell, 2004; Gray et al., 2001, Ntim, 2016). A systematic longitudinal analysis of corporate environmental disclosure and corporate governance mechanisms should be conducted. If such relationships exist, they may well only be revealed over time as they may prove to be unstable from year to year (Gray et al., 2001) or even from one event to another within the year. Therefore, a longitudinal study on a yearly basis that can trace the disclosure practices over several years may help provide insights into the relationship in question. Moreover, it will help trace the trend of disclosure and the impact of corporate governance against the background of environmental and economic development in the country (Haniffa and Cooke, 2005). Longitudinal analysis would help to resolve issues concerning causality and shed more light on the evolving pattern of the environmental disclosures (Brammer and Pavelin, 2006).

Finally, a major concern is that many earlier studies use a method of estimation, typically Ordinary Least Squares (OLS), which is unsuitable for categorical censored data such as those typically gleaned from content analysis (Brammer and Pavelin, 2006). In addition, OLS fails to control adequately for firm size, industry and other significant determinants of disclosure decisions (Patten, 2002). Therefore, additional statistical methods such as GLS regression should be undertaken to further test the research

hypotheses and to attest the reliability of the main OLS regression results. Finally, sensitivity analysis using Ordinary Least Squares (OLS) pooled regression with robust standard error can be carried out to check the sensitivity and, hence, the robustness of the main regression analysis.

4. Conclusion

This paper provides a review of the pertinent prior literature on corporate environmental disclosures and the relationship of the quantity and the quality of such disclosures to corporate governance mechanisms. It commences with an overview of corporate environmental disclosure practices. The concept of corporate governance is introduced to encompass both internal aspects of the company, such as internal controls and board structure, and external aspects such as the relationship with shareholders and other stakeholders. Corporate governance has been recently linked to long-term corporate sustainability that concerns various stakeholder groups.

The paper then examines prior literature on the quantity and quality corporate environmental disclosure and their association with corporate governance mechanisms. Accordingly, the present study is expected to contribute to the accounting knowledge in two different but interrelated contexts. First, the study provides an updated documentary of corporate environmental disclosure practices. Second, it reviews and summarizes empirical evidence on the association between corporate governance mechanisms and each of the quantity and quality of corporate environmental disclosure in companies' annual reports. In doing so, it negates the traditional belief of quantity representation of quality by investigating issues as environmental disclosure quality identification and assessment.

The study concludes with a discussion highlighting possible reasons for the failure of prior research to establish consistent and conclusive results and identifying any gaps in the existing literature. Of particular interest is the assessment of environmental disclosure quality which still remains a rather controversial issue. Calls have been made for a shift in the issue of disclosure quality from quantitative measurement to qualitative assessment. Attempts to respond to such calls can represent potential prospects for future research. Another way of addressing quality issues is to conduct in-depth interviews with corporate decision-makers, such as senior managers, directors, and owners. Of considerable importance would be future studies on the auditing or assurance process of corporate environmental reporting including the mechanism of the process, the unique qualifications of environmental auditors and the characteristics of the audit committee necessary for undertaking such environmental auditing.

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