
Internal contextual factors influencing the extent of environmental disclosure

Faisal Faisal* and Tarmizi Achmad

Department of Accounting,
Diponegoro University,
Semarang, Indonesia
Email: Faisal@undip.ac.id
Email: t_achmad@yahoo.com.au
*Corresponding author

Abstract: The purpose of this study is to examine whether internal contextual factors such as the presence of an environmental committee and an Environmental Management Systems (EMS) enhances the extent of companies' environmental communication. One hundred sixty-three sustainability reports of large companies for the year ending 2009 are analysed by using an unweighed disclosure index. Our results show that the presence of an environmental committee and an EMS is directly related to the disclosure of a greater amount of environmental information. The findings of this study offer insight into the establishment of governance standards concerning the role of an environmental committee and the presence of an EMS in enhancing the credibility of environmental reporting. This study contributes valuable further development of insight into environmental disclosure practices. The results offer the business and accounting professions a better understanding of environmental communication.

Keywords: environmental disclosure; environmental committee; EMS; environmental management systems; legitimacy theory; sustainability report; corporate social responsibility.

Reference to this paper should be made as follows: Faisal, F. and Achmad, T. (2014) 'Internal contextual factors influencing the extent of environmental disclosure', *Int. J. Managerial and Financial Accounting*, Vol. 6, No. 4, pp.357–374.

Biographical notes: Faisal is an Associate Professor of Accounting at the Department of Accounting, Diponegoro University, Semarang, Indonesia. His research is mainly in the area of sustainability reporting. Some of his articles have been published in *Australasian Accounting Business and Finance Journal*, *Journal of Human Resource Costing and Accounting* and *The Indonesian Journal of Accounting Research*.

Tarmizi Achmad is an Associate Professor of Accounting at the Department of Accounting, Diponegoro University, Semarang, Indonesia. He is currently serving as the Vice-Director of the PhD Programme at the Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia. He is a Member of Indonesia Chartered Accountant. His research interest is in financial reporting and corporate governance areas. One of his articles has been published in *The Journal of Global Business Issues*.

This paper is a revised and expanded version of a paper entitled 'A study of the impact of internal organisational systems on environmental communication' presented at the 'Brawijaya International Conference on Accounting and Business', Malang, Indonesia, 30–31 August 2013.

1 Introduction

Over the past two decades, research in environmental disclosure has focused on the extent and determinants of environmental disclosure (see, e.g., Wiseman, 1982; Deegan and Gordon, 1996; Neu et al., 1998; Patten, 2002; Cormier and Magnan, 2003; Cormier et al., 2005; Clarkson et al., 2008; Aerts and Cormier, 2009; Coetzee and Van Staden, 2011; Chu et al., 2013). While numerous studies have investigated the determinants of environmental disclosures (e.g. firm size, industry, leverage, profitability, ownership, governance, culture and country of origin), few studies have examined whether internal organisational systems enhance the extent of environmental disclosures. These studies explore only the influence of institutional or contextual factors on environmental disclosures; they tend to ignore the impacts and the extent of influence of internal organisational systems. Adams (2002) notes that specific internal organisational systems¹ need to be considered as they are vital to enabling companies to credibly monitor and report environmental activities. For instance, the purpose of an environmental committee is to represent the board and to assist the board in its oversight of environment-related issues. Therefore, the existence of such a committee could be associated with a greater propensity to disclose more environmental information (Cowen et al., 1987).

Tilt (2001) argues that environmental reporting studies also need to consider the link between disclosure and companies' environmental management policies. Dixon et al. (2005, p.704) argue that a number of companies prefer not to engage in environmental reports because these companies face obstacles to producing detailed environmental reports. The presence of an Environmental Management System (EMS), such as environmental initiatives, is established to assist in the production of environmental reports. For example, an EMS such as the International Standard ISO 14001 provides guidance in making publicly available periodic environmental statements that provide stakeholders with information on their environmental performance (Perez, et al., 2007, p.404).

The legitimacy theory posits that companies making corporate social environmental disclosures are seeking to close legitimacy gaps (Lindblom, 1994; Gray et al., 1995). The legitimacy theory suggests that higher levels of corporate environmental disclosure indicate an apparent need perceived to maintain and/or restore a perceived legitimacy gap. Specific internal organisational systems are an essential part of enabling to facilitate companies to adequately monitor changing societal expectations and to mitigate the risk associated with these expectations (Rankin et al., 2011). The presence of such an environmental committee may be seen as a mechanism of legitimacy and positive reputation, as its role is to ensure that the company is managed in a socially responsible way and that the stakeholders' expectations are addressed (Michelon and Parbonetti, 2012). More stakeholders are now putting great pressure on companies to become environmentally responsible (Jose and Lee, 2007) and to concentrate on the reporting of relevant environmental information (Cormier et al., 2005). Past studies indicate that the

primary reasons companies seek external validation or certifications of their EMS (for example ISO 14001 certification) are to make their environmental performance more transparent, improve their credibility and encourage public perception of competent environmental management (Dixon et al., 2005; Yusoff et al., 2006; Jose and Lee, 2007; Comoglio and Botta, 2012).

The aims of this study are to investigate the extent of environmental disclosure made by companies from high-profile industries in their sustainability reports and then to examine the relationship between the internal organisational systems and the extent of environmental disclosure based on legitimacy tenets framework. The following two research questions are addressed:

RQ1: What is the extent of environmental disclosure of high-profile companies in their sustainability reports?

RQ2: Does the presence of an environmental committee and an EMS influence the extent of environmental disclosures?

This study contributes to the developing stream of research on environmental disclosures in two ways. First, this study explores the role of an environmental committee and an EMS in enhancing the extent of environmental information disclosed, which is an area that is still sparsely researched. This study is expected to contribute to the knowledge of how internal contextual factors (the presence of an environmental committee and the presence of an EMS) influence environmental communication. Second, we use stand-alone sustainability reports to capture the extent of environmental matters disclosed by companies unlike in previous studies (see, e.g., Rankin et al., 2011; Kent and Monem, 2008; Cowen et al., 1987). The findings of Frost et al. (2005) suggest that annual reports provide less insight into Corporate Social Responsibility (CSR) than stand-alone sustainability reports. Accordingly, this study focuses solely on sustainability reports as a media source for capturing and analysing environmental information. This research focus provides a clearer understanding of companies' environmental details in sustainability reports to be more fully comprehended.

2 Literature review

Environmental issues have become increasingly important to a range of stakeholders and attention has focused on the environmental impacts of corporate activities (Hughes et al., 2001). Different stakeholder groups are now concerned with the way in which corporates are responding to environmental issues. It is not surprising that companies around the world now are under more public scrutiny and pressure since they have to provide information on their environmental performance (Rao et al., 2012). Corporate communications via annual reports, stand-alone reports or websites are essential for understanding and helping companies to manage the relationships between company and their stakeholders (Joshi and Gao, 2009). Adams and Zutshi (2004) argue that companies may attempt to alter outside expectations or perceptions of their environmental performance through their reports. Disclosure also can be used as an additional driver for organisations to focus on environmental improvement (Perry and Sheng, 1999).

Environmental disclosure has been defined broadly as providing information in relation to the environmental implications of their operations (Deegan, 2006). It has

commonly been viewed as a pre-emptive step to mitigate adverse regulatory or legislative pressures in the future (Brammer and Pavellin, 2008). The ability of a company to communicate their environmental activities and performance effectively to its key stakeholders, such as customers, employees, investors, suppliers and community groups, helps it to build trust and credibility among these groups that matter the most to a company (KPMG, 2008). Better understanding of corporate activities reduces criticism from external and internal sources, leading to improve reputation (Adams, 2002).

Environmental accounting literature shows that environmental disclosure has been well researched. While many factors of environmental disclosure have been examined as determinants, past study suggests that the presence of an environmental committee can be viewed as a mechanism for a company in attempt to demonstrate greater accountability and transparency (Kent and Monem, 2008). It can also be used to motivate a firm to implement environmental policies (Rankin et al., 2011).

In the international arena, the last decade has seen an increase in companies' adoption of a voluntary EMS. For instance, in 1993, the European Union published the Environmental Management and Audit Scheme (EMAS) to certify organisations that establish an EMS in accordance with certain guidelines (Montiel and Husted, 2009). Environmental accounting literature suggests that an EMS is considered as the part of management system that allows an organisation to integrate environmental issues into day-to-day decisions (Lyon and Maxwell, 2011). An EMS includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources used to establish and implement the environmental policy and objectives of the organisation (Montiel and Husted, 2009). The ISO 14001 standard (ISO, 2004, p.2) defines an EMS thus: "The part of the overall management system that includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy."

A strong EMS is essential to drive improved performance and to help companies systematically identify and appropriately manage their environmental obligations and risks (Epstein and Roy, 1998). Specifically, it offers an incentive in the form of operational improvements such as reduction in wastes, pollution levels and saving costs (Yusoff et al., 2006). Therefore, the presence of an EMS may be seen as an indicator of business commitment towards environmental improvement (Sumiani et al., 2007) and as a signal of their super environmental performance to stakeholders (Qi et al., 2012).

Various theoretical perspectives have been used in seeking to understand corporate environmental disclosure. Agency theory, political economy theory, legitimacy theory, stakeholder theory and institutional theory have been adopted by a number of researchers. Other studies have also employed other multiple theoretical lenses in explaining environmental disclosure practices (see, e.g., Rankin et al., 2011; Coetzee and Van Staden, 2011). Deegan (2002) argues that legitimacy theory is widely used to explain social and environmental disclosure. In addition, Archel et al. (2009) suggest that the dominant status of legitimacy theory attained in environmental disclosure research has contributed to understanding of the motives and the incentives that lead firms' managers to engage in environmental activities.

Cho and Patten (2007) argue that companies use environmental disclosure as a strategic tool for reducing their exposures to political and regulatory concerns. Rao et al. (2012) argue that the motivations of companies to disclose environmental issues are to gain stakeholder support, to assess possible risks involved in conducting such operations

and to reduce the impact of their operations on the environment. Previous studies suggest that disclosure is a tool for maintaining legitimacy and for developing a positive corporate image (Patten 1991; Deegan 2002).

3 Hypotheses development

The role of an environmental committee may directly be linked with environmental concern displayed by corporations. Adams (2002) argues that a company's reporting process and decision-making are influenced by the degree of formality vs. informality, the departments involved and the extent of engagement of stakeholders. Specific internal systems are vital to enable companies to credibly monitor environmental activities (Rankin et al., 2011). For example, the presence of an environmental committee (composed of key business personnel) facilitates the embedding and integration of environmental issues into business practices and defines strategic plans for the corporate's sustainability policies, submitting them for the board's approval.

The environmental committee is also required to provide material sustainability issues (e.g. environmental incident, environmental health and safety) and report them to the board. The board then retains full responsibility for environmental management and oversees that the key environmental initiatives have been implemented. Such a committee can hold stakeholder events to better ensure the environmental management policy is in line with stakeholder expectations (Spitzeck, 2009). A firm more actively engaging with stakeholders can undertake various actions in order to better manage environmental issues (Mallin and Michelon, 2011). By managing, coordinating and communicating environmental activities, it might help companies to maintain their social licence to operate.

Prior studies² suggest that the presence of an environmental or a CSR committee affects the level of social and environmental disclosure. For instance, Ullman (1985) argues that the presence of such a committee is an effective monitoring device for improving the range of disclosures provided to stakeholders. Cowen et al. (1987) test the relationship between company characteristics and the types of social and environmental disclosure. They argue that the existence of such a committee could be associated with a greater propensity to communicate social and environmental issues. Their finding provides evidence that there is a significant association between human resources disclosures and the presence of environmental/CSR committee.

Rankin et al. (2011) examine the relationship between the presence of an environmental committee and the extent of voluntary corporate greenhouse gas emissions disclosure. They argue that the presence of the committee motivates a firm to implement policies and practices to measure and report on greenhouse gas emissions level. Moreover, they hypothesise that firms that have voluntarily introduced an environmental committee (as a part of the board) are more likely to voluntarily disclose credible greenhouse gas emissions information in their reports. However, their study failed to statistically show the relationship between the presence of an environmental committee and the extent of corporate greenhouse gas emissions disclosure.

Kent and Monem (2008) study the factors that drive the adoption of Triple Bottom Line (TBL) reporting. They argue that a CSR committee encourages companies to demonstrate greater accountability and transparency in social and environmental

disclosure, and that it constitutes a formal recognition that social and environmental disclosure impacts the activities of the company. Their result shows that a CSR committee is positively related to the adoption of TBL reporting.

From the point of view of legitimacy theory, the presence of such a committee within the board may strengthen the public perception of corporate legitimacy. As argued by Mallin and Michelon (2011), when the board appoints an environmental or a CSR committee to manage the social and environmental impacts on business activities, it is more likely that the company will have greater legitimacy in the community in which it operates.

Based on the findings of these studies, it can be argued that the existence of an environmental committee is likely to impact the extensiveness, quality, quantity and completeness of reporting. It also indicates a greater willingness and commitment to consider wider corporate environmental issues within the decision-making framework of the company. The presence of such committee may encourage companies to demonstrate greater accountability and transparency in environmental disclosure. By maintaining the highest level of environmental disclosure to their stakeholders, the companies ensure that their stakeholders have timely and equal access to information about their environmental performance. Thus, it can be expected that companies which have an environmental committee will disclose a higher level of environmental disclosure. The first hypothesis is the following:

Hypothesis 1: There is a positive relationship between the presence of an environmental committee and the extent of environmental disclosure in sustainability reports.

Prior studies have noted various influencing factors that motivate a company to adopt an EMS. Companies are more likely to disclose information on successful results obtained from the implementation of an EMS as it provides confidence to external parties, providing evidence that the companies have control over the significant aspects of their operations and activities as well as to make a positive impact on their business performance (Sumiani et al., 2007) and to reduce incentives for greenwash (Lyon and Maxwell, 2011).

Empirical evidences show that an EMS plays a significant role in influencing companies to communicate environmental activities. Firms may implement their environmental policy such an EMS to develop methods and channels of communication for informing and communicating with all stakeholders on activities related to the environment. As argued by Bouma and Kamp-Roelands (2000), companies regard management systems as tools by which environmental information may be generated. For example, management systems assist companies to measure and report on various aspects such as financial, quality, environmental, ethical and social performances.

Naude et al. (2011) show that there is a growing trend for companies to adopt EMS to promote their environmental engagement and in order to improve the quality and reliability of disclosure. Therefore, a sophisticated EMS is needed by companies to generate information which forms the basis for communication to internal and external stakeholders on matters such as health, safety and the environment (Bouma and Kamp-Roelands, 2000). As shown by Mitchell and Hill (2009), companies implementing an EMS (e.g. ISO 14001) disclosed a higher level of environmental information.

From the perspective of legitimacy theory, the adoption of an EMS enables companies to provide credible environment information to be communicated to their key stakeholders in annual or stand-alone sustainability reports. It also can mitigate risks

associated with societal expectation (Rankin et al., 2011). An EMS may provide the company with appropriate data and tools to design, implement and improve its environmental programmes (Epstein and Roy, 1998). By adopting the EMS, companies want to indicate to stakeholders that they have high commitment to environmental management and address environmental issues. In doing so, they may satisfy the expectations of a broad range of stakeholders. As argued by Bouma and Kamp-Roelands (2000), a good-quality EMS producing reliable environmental information is the key to satisfying stakeholders' needs. Based on the results of previous studies, it can be expected that a company's adoption of an EMS is an environmental strategy to legitimate their environmental management. Thus, the second hypothesis is as follows:

Hypothesis 2: There is a positive relationship between the presence of an EMS and the extent of environmental disclosure in sustainability reports.

4 Research method

The initial sample includes 1418 companies from 59 countries listed on the GRI websites for fiscal year 2009. The companies chosen as sample in this study are all public companies. The sample firms have to meet the following criteria:

- 1 They have to have a 2009 fiscal year.
- 2 They have to have an English version stand-alone sustainability reports.
- 3 They are public and parent companies in their countries.
- 4 They are from high-profile industries (e.g. oil and gas, basic materials and utilities).
- 5 They have complete data regarding the dependent and independent variables which are available on sustainability and annual reports, ORBIS and Factiva databases or company's websites.

Sustainability reports are used to measure the extent of a company's environmental communication. The sustainability report is selected as the source of environmental disclosures and the extent to which they contain narrative describing both environmental issues and implementation of internal organisational systems. Previous studies of environmental disclosure practices have almost solely focused on annual reports (see, e.g., Wiseman, 1982; Epstein and Freedman, 1994; Tilt, 2001; Smith et al., 2007). These studies generally assume that annual reports contain key environmental information. However, a study conducted by Frost et al. (2005)³ show that the annual reports provide a limited number and narrow range of environmental indicators and information. The stand-alone sustainability reports are used in this study as they contain the diversity and details of sustainability issues (Roca and Searcy, 2012). For example, they provide information on how the company performs gathering, benchmarking and establishing accountability information (Bartels et al., 2008). Thus, it is expected that sustainability reports are likely to reflect more environmental concerns. Table 1 summarises the sample selection.

Consistent with Clarkson et al. (2008) and Moroney et al. (2012), the environmental disclosure items are calculated by adoption of the 2006 version of the GRI guidelines.

The utilisation of a well-established checklist items such as the 2006 GRI items to collect data enhances the reliability of this disclosure index. GRI (2006) reporting guidelines contain 30 indicators that reflect the spirit of environmental concern. These 30 indicators⁴ can be broken down into nine categories: materials; energy; water; biodiversity; emissions, effluents and waste; product and services; compliance; transport; and overall.

Table 1 Sample selection

Total companies listed on GRI's report lists (retrieved on 24 November 2010)	1418
Less companies that do not have a stand-alone report (e.g. annual reports or integrative reports only)	(195)
Less companies that do not have a sustainability report in an English language version	(383)
Less companies that are not a public and parent company	(272)
Less companies that are not from an environmentally sensitive industry (e.g. financials, consumer goods, consumer services, industrials, telecommunications, and technology) ^a	(405)
Final sample ^b	163

Notes: ^aOf the 163 sample firms, 25 are from oil & gas industries, 37 from utilities industries and 101 from basic materials industries.

^bThe final sample consists of 51 firms from Australia, Asia and African countries, 53 from European countries and 59 from North and South American countries.

Consistent with past environmental disclosure studies (see, e.g., Clarkson et al., 2008; Aerts and Cormier, 2009; da Silva Monteiro and Aibar-Guzman, 2010; Rankin et al., 2011), this study employs a disclosure index to measure the extent of environmental disclosure, as this approach enables the researcher to gain better insights into the level and type of environmental information communicated by companies (Joseph and Taplin, 2011). The unweighted approach is adopted in this study. The environmental index is calculated as a dichotomous equally weighted (i.e. unweighted) index on a 0–100% scale. All items are equally weighted and each of the 30 GRI possible indicators that are disclosed is awarded a score of 1 (and a score of 0 if not disclosed). Items are removed from the equation when they are not applicable. The utilisation of a dichotomous equally weighted index is preferred because this study is concerned with the level of disclosure as opposed to the company's perceived importance of disclosed items.

The presence of an environmental committee is measured by a dummy variable that takes the value of 1 if the company has an environmental committee (e.g. sustainability, environmental or health and safety committee) and 0 otherwise. The empirical governance literature suggests that this increases the level of corporate communication because such independence will foster board effectiveness (Haniffa and Cooke, 2005). Prior studies suggest that the presence of an environmental committee affects the level of environmental disclosure (Kent and Monem, 2008; Mallin and Michelon, 2011).

Numerous studies argue that adoption of an EMS will enhance the extent of environmental disclosure (Mitchell and Hill, 2009; Naude et al., 2011). This study measures the presence of an EMS as a dichotomous variable. The presence of an EMS takes the value of 1 in the case of the EMS being adopted by the company, and 0 otherwise.

Table 2 Summary of variable measurement

<i>Variables</i>	<i>Measurement</i>
<i>Dependent</i>	
Environmental Disclosure (ENVDIS)	30 items. The formula of the index is as follows (Haniffa and Cooke, 2005): $ENVDIS_j = \frac{\sum_{i=1}^{n_j} X_{ij}}{n_j}$ where $ENVDIS_j$ = environmental disclosure index for firm j n_j = number of items expected for j th firm, $n_j \leq 30$ X_{ij} = 1 if i th item disclosed, 0 if i th item not disclosed $0 \leq ij \leq 1$
<i>Independent</i>	
Environmental committee	1 = have a CSR committee and 0 = otherwise
Presence of EMS	1 = have EMS and 0 = otherwise
<i>Control</i>	
Firm size	Total assets (log)
Leverage	Total net profit divided by total assets
Profitability	Total liabilities divided by total assets

Three control variables will be employed in this study. These are firm size, leverage and profitability. The selection of control variables are based on previous studies. Firm size is commonly used as a proxy for public visibility. The more visible the companies are, the more environmental activities will be considered, and disclosure can then be used as a way to enhance corporate reputation. This is consistent with legitimacy theory tenets. Patten (1991), Cormier and Gordon (2001), Cormier et al. (2005) and Coetzee and Van Staden (2011) have concluded that firm size appears to be a significant determinant of environmental disclosure. No overarching theoretical reason exists for a particular measure of firm size (Hackston and Milne, 1996). Therefore, consistent with the majority of the past literature, this study uses the total assets as the proxy of firm size. Firm size will be logged to reduce skewness and the impact of outliers (Tabachnick and Fidell, 2007). Past studies often have used leverage as an indicator to measure systematic risk companies. Leverage is measured as the ratio of total liabilities to total assets. Brammer and Pavelin (2008) and Reverte (2009) argue that a low degree of leverage ensures that creditor stakeholders will exert less pressure to constrain managers' discretion over environmental activities, which are only indirectly linked to the financial success of the firm. Prior studies on disclosure literatures find that leverage is often negatively related to disclosure (see, for example, Belkaoui and Karpik, 1989; Branco and Rodrigues, 2008). Return on Assets (ROA) is used to measure profitability. Firms with high profitability have a greater propensity to reveal their good news and tend to have higher levels of environmental disclosure (Aerts and Cormier, 2009). ROA is measured as the ratio of total net profit divided by total assets.

This study employs Ordinary Least Square (OLS) multiple regressions as the main statistical technique to test these hypotheses. The regression models used is

$$\begin{aligned}
 ENVDIS = & \beta_0 + \beta_1 \text{Presence of environmental committee} \\
 & + \beta_2 \text{Presence of Environmental Management Systems} \\
 & + \beta_3 \text{Firm Size} + \beta_4 \text{Leverage} + \beta_5 \text{Profitability} + \varepsilon
 \end{aligned}$$

Independent sample *t*-tests are also used to test whether or not there is a significant difference in the extent of environmental disclosure between firms that have an environmental committee and firms that do not and between companies that have an EMS and companies that do not.

5 Results

The descriptive statistics shown in Table 3 provide an overview of the continuous variables. The results show that the average company included in this study is large in size.⁵ The mean (median) of their total assets is 61,871 (11,495) million USD. The firm size ranged widely from 69 to 4,408,917 million USD. With regard to the control variables, Table 3 shows that an average (median) leverage ratio of the sample firms is 54.66% (44.00%). The mean of the profitability ratio suggests that companies have a relatively low financial performance, with a minimum value ROA of -18.00% and overall mean (median) of 4.72% (4.00%).

Table 3 Descriptive statistics for continuous variables

<i>Variables</i>	<i>Mean</i>	<i>Median</i>	<i>Std dev</i>	<i>Minimum</i>	<i>Maximum</i>
Environmental disclosure (%)	63.53	63	23.32	10	100
<i>Firm size</i>					
Total assets (million USD)	61,871	11,495	348,441	69	4,408,917
Total assets (log)	9.41	9.34	1.62	4.24	15.30
Leverage (%)	54.66	44	19.24	2	120
Profitability (%)	4.72	4	6.19	-18	34
<i>N = 163</i>					

Table 4 shows the descriptive statistics for the categorical variables. Concerning the presence of an environmental committee, 69 firms or 42.33% of the total 163 sample have an environmental committee under the board of directors or under the executive of the company. The results of the descriptive statistics also highlight that the majority of sample of companies have an EMS (113 firms or 69.33%).

Table 4 Descriptive statistics for categorical variables

<i>Variables</i>	<i>Frequency</i>	<i>%</i>
<i>Presence of environmental committee</i>		
Yes	69	42.33
No	94	57.67
<i>Presence of Environmental Management Systems (EMS)</i>		
Yes	113	69.33
No	50	30.67
<i>N = 163</i>		

The results of independent sample *t*-tests of the presence of an environmental committee (see Table 5) show that the mean of environmental disclosure (ENVDIS) for companies which have an environmental committee is higher (68.38%) than that for those who do not have one (59.98%). They are statistically significant differences between companies

which have an environmental committee and companies that do not have one ($t = 2.302$; $p = 0.023$). This result is consistent with Michelon and Parbonetti (2012) and Cowen et al. (1987) who find a positive relationship between the presence of such of a committee and social and environmental disclosure. Spitzeck (2009) argues that firms with a CSR committee in place outperform others in CSR communications. The result indicates that the existence of such a committee could be associated with a greater corporate propensity to make disclosures about social and environmental involvement (Cowen et al., 1987). As argued by Adams (2002), the presence of such a committee may affect the internal processes of social and environmental reporting or the attitudes which influence decision-making. As the purpose of such a committee is to represent the board and to assist the board in its oversight of health, safety- and environment-related issues, the presence of such a committee will likely encourage companies to disclose more environmental information.

Table 5 Independent samples *t*-tests

<i>Environmental Disclosure (ENVDIS)</i>	<i>Mean</i>	<i>t-value</i>	<i>p-value</i>
<i>Presence of an environmental committee</i>		2.302	0.023**
Have ($N = 69$)	68.38		
Not ($N = 94$)	59.98		
<i>Presence of environmental management systems</i>		2.299	0.001***
Have ($N = 113$)	67.42		
Not ($N = 50$)	54.74		

Notes: ***Significance at the 1% level of confidence.

**Significance at the 5% level of confidence.

Concerning the presence of EMS, Table 5 presents the result of independent sample *t*-tests. The presence of the EMS variable shows that the mean of ENVDIS for firms that have an EMS is higher (67.42%) than that for firms that do not have an EMS (54.74%). The statistical analysis indicates that there are statistically significant differences between firms that have and do not have an EMS ($t = 2.299$; $p = 0.001$) in regard to environmental communication. This result suggests that firms with an EMS certification are more likely to disclose environmental activities. This finding indicates that firms which have a validation or certification for their environmental management policies from external parties may be doing so to enhance their credibility.

Table 6 shows the correlations between variables. The result shows that the directional correlation among dependent, independent and control variables all are consistent with predictions (except profitability).

Table 7 details the results of multiple regression.⁶ The result of multiple regression shows the model fits and is statistically significant with *F*-statistic = 5.942 and $p = 0.000$. The regression has an adjusted R^2 of 13.20%. Further, the regression results show the following. First, the regression in Table 7 suggests that there is a positive and statistically significant association between the presence of an environmental committee and the extent of environmental disclosure (ENVDIS) ($p = .010$). This finding is consistent with the notion that the existence of such committees could be associated with a greater corporate propensity to communicate environmental issues. It may be that such a committee is an effective monitoring device for improving the range of disclosures provided to stakeholders. As argued by Kent and Monem (2008), an environmental

committee encourages companies to demonstrate greater accountability and commitment of business activities and transparency in environmental disclosure and it constitutes a formal recognition of the environmental impact on the activities of the company. Thus, Hypothesis 1 is accepted.

Table 6 Pearson correlation

	1	2	3	4	5	6
EnvDis	1					
Presence env committee	.178*	1				
Presence of EMS	.252**	.031	1			
Firm size	.192*	.014	.160*	1		
Leverage	.224**	-.132	.087	.157*	1	
Profitability	-.056	-.102	.015	.155*	-.172*	1

Notes: **Significance at the 5% level of confidence.

*Significance at the 10% level of confidence.

From the point of view of legitimacy theory, the findings of this study suggest that the presence of an environmental committee could strengthen the public perception of corporate legitimacy and enhance corporate image. The public may value an entity and consider it more transparent and accountable if it has an environmental committee. Such a committee could serve as a mediator among different stakeholder groups and it could also act as an assisting, monitoring and supervising mechanism to better ensure that companies have well-addressed environmental issues, including external communication. Moreover, an environmental committee typically has responsibility for several functions: defining and implementing the EMS; coordinating the dissemination and implementation of environmental and sustainability policies; ensuring ongoing dialogue and involvement with stakeholders; and responding to stakeholder information requests regarding company sustainability policies and initiatives.

Table 7 Multiple regression analysis

Variables	Predicted sign	Coefficient	t-value	p-value
Intercept		0.219	2.032	0.044**
Presence env committee	+	0.092	2.613	0.010***
Presence of EMS	+	0.105	2.790	0.006***
Firm size (log assets)	+	0.018	1.672	0.097*
Leverage	+	0.251	2.694	0.008***
Profitability	+	-0.089	-0.311	0.756
Adjusted R^2		0.132		
F-value		5.942		
Prob. (F)		0.000		
N = 163				

Notes: ***Significance at the 1% level of confidence.

**Significance at the 5% level of confidence.

*Significance at the 10% level of confidence.

Second, there is a positive and significant relationship between the presence of an EMS and the extent of environmental disclosure ($p = .006$), suggesting that the companies adopting an EMS provide higher environmental disclosure. Thus, Hypothesis 2 is accepted. This finding is consistent with the notion that companies adopt an EMS to enhance the corporate image about their environmental information credibility to their key stakeholder groups and to gain trust as well as mitigate risks associated with society expectation change (Sumiani et al., 2007; Rankin et al., 2011). Overall, the companies have strong incentive to adopt an EMS in order to get external legitimacy (Darnall, 2006; Bansal and Hunter, 2003). From the legitimacy theory, by providing the credibility environmental information to their stakeholders, it may make the company look good. For instance, firms with an EMS may shape public perceptions about their concerns regarding environmental activities, such as reducing global warming (Rankin et al., 2011), and commit their environmentally friendly products to their consumers (Adams, 2002).

Third, the findings in Table 7 show that firm size is positively associated with environmental disclosure (ENVDIS). However, the p -value (0.097) is statistically significant only at the 10% level. This study indicates that firm size is a predictor of the extent of corporate environmental disclosure. Legitimacy theory predicts that firm size will affect the firm's visibility to the general public and will tend to create increased public scrutiny (Cormier et al., 2005; Aerts and Cormier, 2009). This finding is in line with the vast majority of the literature on legitimacy theory (see, e.g., Cormier and Gordon, 2001; Coetzee and Van Staden, 2011).

This study finds that leverage is statistically significant ($p = .008$). The significant result between leverage and environmental disclosure is consistent with the prediction and some prior environmental studies (see, e.g., Clarkson et al., 2008). The result suggests that companies with higher leverage tend to disclose more environmental information. From legitimacy perspectives, this finding implies that firms may provide more environmental information to mitigate pressures from creditors. The finding shows that profitability is not associated with the extent of environmental disclosure ($p = .756$). The result is not consistent with the prediction. Gray et al. (2001) argue that the relationship between environmental disclosure and profitability is still inconclusive. Previous studies find that there is no relationship between environmental disclosure and profitability (see, e.g., Cowen et al., 1987; Hackston and Milne, 1996; Clarkson et al., 2008; Aerts and Cormier, 2009; Reverte, 2009). The influence of economic performance is weak and inconsistent (Williams, 1999) as social and environmental reporting is primarily more likely to be driven by non-economic events (Ho and Taylor, 2007).

6 Conclusions and implications

This study notes that the extent of environmental disclosure is inextricably linked to the presence of an environmental committee. From a theoretical viewpoint, this result supports the argument developed by Adams (2002) in relation to the role of internal contextual factors influencing the extent of corporate social and environmental disclosure. The implications of this study point to promising avenues for research. Academic researchers should further explore the role of environmental or CSR committees in influencing the process of corporate environmental reporting. The degree to which the presence of such committee affects corporate environmental disclosure

needs to be analysed in greater detail, beyond the distinction of committee structure. The level of independence in social and environmental decision-making may differ between committees formed under the control of boards of directors and those that are under the executive committees. From a practical point of view, these findings offer insights into governance standard setters or regulators in terms of the role of an environmental committee in enhancing the credibility of environmental reporting.

This study also concludes that the adoption of an EMS affects the extent of environmental disclosure. This finding may imply that adoption of an EMS enhances the quality of environmental disclosure. The extent of environmental disclosure for companies that adopt an EMS is higher than that for companies that do not (see Table 5). A possible explanation of this could be that an EMS improves the credibility and transparency of environmental communication in sustainability reports (Ribeiro and Aibar-Guzman, 2010). The presence of an EMS such as the ISO 14001 certification acts to positively influence the compliance perception of a company's environmental policy.

The findings of this study are consistent with the legitimacy theory tenets. For instance, legitimacy theory posits that higher environmental disclosure indicates a need to maintain and/or restore a perceived legitimacy gaps. Verification given by external parties such as ISO 14001 may enhance a company's reputation. In addition, an implementation such as the ISO 14001 certification might be used by a company to further legitimise its actions. According to Dixon et al. (2005), most organisations adopting an EMS may have the desire to legitimise their environmental activities and enhance public perceptions of their environmental performance. As EMS is an important aspect in enhancing transparency and accountability of environmental reporting, there is a need for further research in this area.

Several limitations of this study need to be noted. This study assumes that the 30 indicators used as checklist benchmarks in GRI (2006), as well as the implementation of EMS (ISO 14001), are voluntary in each country. This study focuses on a single period (2009) and concentrates on an English version of sustainability reports, thereby limiting the generalisability for other time periods and the representation of countries in this study. Finally, since the disclosure index is developed on the basis of information disclosed in the stand-alone reports, it may reduce the number of companies that could be in the sample. This is a limitation based on the likelihood that bigger firms can have stand-alone sustainability reports; therefore, the sample may be biased towards larger firms.

References

- Adams, C.A. (2002) 'Internal organisational factors influencing corporate social and ethical reporting: beyond current theorising', *Accounting, Auditing and Accountability Journal*, Vol. 15, No. 2, pp.223–250.
- Adams, C.A. and Zutshi, A. (2004) 'Corporate social responsibility: why business should act responsibly and be accountable', *Australian Accounting Review*, Vol. 14, No. 3, pp.31–39.
- Aerts, W. and Cormier, D. (2009) 'Media legitimacy and corporate environmental communication', *Accounting, Organizations and Society*, Vol. 34, No. 1, pp.1–27.
- Archel, P., Husillos, J., Larrinaga, C. and Spence, C. (2009) 'Social disclosure, legitimacy theory and the role of the state', *Accounting, Auditing and Accountability Journal*, Vol. 22, No. 8, pp.1284–1307.

- Bansal, P. and Hunter, T. (2003) 'Strategic explanations for the early adoption of ISO 14001', *Journal of Business Ethics*, Vol. 46, No. 3, pp.289–299.
- Bartels, W., Iansen-Rogers, J. and Kuszewski, J. (2008) *Count me in: the readers' take on sustainability reporting*, KPMG and SustainAbility. Available online at: <http://www.kpmg.com/GR/en/IssuesAndInsights/ArticlesPublications/Sustainability/Documents/CountMeIn.pdf> (accessed on 5 March 2012).
- Belkaoui, A. and Karpik, P.G. (1989) 'Determinants of the corporate decision to disclose social information', *Accounting, Auditing and Accountability Journal*, Vol. 2, No. 1, pp.36–51.
- Bouma, J.J. and Kamp-Roelands, N. (2000) 'Stakeholders expectations of an environmental management systems: some exploratory research', *European Accounting Review*, Vol. 9, No. 1, pp.131–144.
- Brammer, S. and Pavellin, S. (2008) 'Factors influencing the quality of corporate environmental disclosure', *Business Strategy and the Environment*, Vol. 17, No. 2, pp.120–136.
- Branco, M.C. and Rodrigues, L.L. (2008) 'Social responsibility disclosure: a study of proxies for the public visibility of Portuguese banks', *The British Accounting Review*, Vol. 40, No. 2, pp.161–181.
- Cahaya, F.R. (2006) *Social Disclosure Practices of JSX Listed Entities*, Master Thesis (unpublished), School of Accounting, Curtin University, Perth, Australia.
- Cho, C.H. and Patten, D.M. (2007) 'The role of environmental disclosures as tools of legitimacy: a research note', *Accounting, Organizations and Society*, Vol. 32, Nos. 7–8, pp.639–647.
- Chu, C.I., Chatterjee, B. and Brown, A. (2013) 'The current status of greenhouse gas reporting by Chinese companies: a test of legitimacy theory', *Managerial Auditing Journal*, Vol. 28, No. 2, pp.114–139.
- Clarkson, P.M., Li, Y., Richardson, G.D. and Vasvari, F.P. (2008) 'Revisiting the relation between environmental performance disclosure: an empirical analysis', *Accounting Organizations and Society*, Vol. 33, Nos. 4–5, pp.303–327.
- Coetzee, C.M. and Van Staden, C.J. (2011) 'Disclosure responses to mining accidents: South African evidence', *Accounting Forum*, Vol. 35, No. 4, pp.232–246.
- Comoglio, C. and Botta, S. (2012) 'The use of indicators and the role of environmental management systems for environmental performances improvement: a survey on ISO 14001 certified companies in the automotive sector', *Journal of Cleaner Production*, Vol. 20, No. 1, pp.92–102.
- Cormier, D. and Gordon, I.M. (2001) 'An examination of social and environmental reporting strategies', *Accounting, Auditing and Accountability Journal*, Vol. 14, No. 5, pp.587–616.
- Cormier, D. and Magnan, M. (2003) 'Environmental reporting management: a continental European perspective', *Journal of Accounting and Public Policy*, Vol. 22, No. 1, pp.43–62.
- Cormier, D., Magnan, M. and Van Velthoven, B. (2005) 'Environmental disclosure quality in large German companies: economic incentives, public pressures or institutional conditions?' *European Accounting Review*, Vol. 14, No. 1, pp.3–39.
- Cowen, S.S., Ferreri, L.B. and Parker, L.D. (1987) 'The impact of corporate characteristics on social responsibility disclosure: a typology and frequency-based analysis', *Accounting, Organizations and Society*, Vol. 12, No. 2, pp.111–122.
- da Silva Monteiro, S.M. and Aibar-Guzman, B. (2010) 'Determinants of environmental disclosure in the annual reports of large companies operating in Portugal', *Corporate Social Responsibility and Environmental Management*, Vol. 17, No. 4, pp.185–204.
- Darnall, N. (2006) 'Why firms mandate ISO 14001 certification', *Business and Society*, Vol. 45, No. 3, pp.354–381.
- Deegan, C. (2002) 'The legitimising effect of social and environmental disclosures: a theoretical foundation', *Accounting, Auditing, and Accountability Journal*, Vol. 15, No. 3, pp.282–311.
- Deegan, C. (2006) *Financial Accounting Theory*, 2nd ed., McGraw-Hill, North Ryde, NSW, Australia.

- Deegan, C. and Gordon, B. (1996) 'A study of the environmental disclosure practices of Australian corporations', *Accounting and Business Research*, Vol. 26, No. 3, pp.187–199.
- Dixon, R., Mousa, G.A. and Woodhead, A. (2005) 'The role of environmental initiatives in encouraging companies to engage in environmental reporting', *European Management Journal*, Vol. 23, No. 6, pp.702–716.
- Epstein, M.J. and Freedman, M. (1994) 'Social disclosure and the individual investor', *Accounting, Auditing, and Accountability Journal*, Vol. 7, No. 4, pp.94–109.
- Epstein, M.J. and Roy, M.J. (1998) 'Managing corporate environmental performance: a multinational perspective', *European Management Journal*, Vol. 16, No. 3, pp.284–296.
- Frost, G., Jones, S., Loftus, J. and Van Der Laan, S. (2005) 'A survey of sustainability reporting practices of Australian reporting entities', *Australian Accounting Review*, Vol. 15, No. 1, pp.89–96.
- Global Reporting Initiative (GRI) (2006) *Sustainability Reporting Guidelines*, GRI, Amsterdam. Available online at: <http://www.globalreporting.org> (accessed 28 September 2011).
- Gray, R., Kouhy, R. and Lavers, S. (1995) 'Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure', *Accounting, Auditing and Accountability Journal*, Vol. 8, No. 2, pp.47–77.
- Gray, R., Javad, M., Power, D.M. and Sinclair, C.D. (2001) 'Social and environmental disclosure and corporate characteristics: a research note and extension', *Journal of Business Finance and Accounting*, Vol. 28, Nos. 3–4, pp.327–356.
- Hackston, D. and Milne, M.J. (1996) 'Some determinants of social and environmental disclosures in New Zealand companies', *Accounting, Auditing and Accountability Journal*, Vol. 9, No. 1, pp.77–108.
- Haniffa, R.M. and Cooke, T.E. (2005) 'The impact of culture and governance on corporate social reporting', *Journal of Accounting and Public Policy*, Vol. 24, No. 5, pp.391–430.
- Ho, L.C.J. and Taylor, M.E. (2007) 'An empirical analysis of Triple-Bottom-Line Reporting and its determinants: evidence from the United States and Japan', *Journal of International Financial Management and Accounting*, Vol. 18, No. 2, pp.123–150.
- Hughes, S.B., Anderson, A. and Golden, S. (2001) 'Corporate environmental disclosures: are they useful in determining environmental performance?' *Journal of Accounting and Public Policy*, Vol. 3, No. 20, pp.217–240.
- International Organization for Standardization (ISO) (2004) *ISO 14001:2004: Environmental management systems – requirements with guidance for use*. Available online at: http://www.iso.org/iso/home/store/publications_and_e-products/publication_item.htm (accessed on 9 February 2011).
- Jose, A. and Lee, M.S. (2007) 'Environmental reporting of global corporations: a content analysis based on websites disclosures', *Journal of Business Ethics*, Vol. 72, No. 4, pp.307–321.
- Joseph, C. and Taplin, R. (2011) 'The measurement of sustainability disclosure: abundance versus occurrence', *Accounting Forum*, Vol. 35, No. 1, pp.19–31.
- Joshi, P.L. and Gao, S.S. (2009) 'Multinational corporations' corporate social and environmental disclosures (CSED) on websites', *International Journal of Commerce and Management*, Vol. 19, No. 1, pp.27–44.
- Kent, P. and Monem, R. (2008) 'What drives TBL reporting: good governance or threat legitimacy?' *Australian Accounting Review*, Vol. 18, No. 4, pp.297–309.
- KPMG (2008) *KPMG international survey of corporate sustainability reporting 2008*. Available online at: <http://www.kpmg.com/global/en/issuesandinsights/articlespublications/pages/sustainability-corporate-responsibility-reporting-2008.aspx> (accessed on 9 February 2010).
- Lindblom, C.K. (1994) 'The implications of organizational legitimacy for corporate social performance and disclosure', Paper presented at *The Critical Perspectives on Accounting Conference*, New York.
- Lyon, T.P. and Maxwell, J.W. (2011) 'Greenwash: corporate environmental disclosure under threat of audit', *Journal of Economics and Management Strategy*, Vol. 20, No. 1, pp.3–41.

- Mallin, C.A. and Michelon, G. (2011) 'Board reputation attributes a corporate social performance: an empirical investigation of the US best corporate citizens', *Accounting and Business Research*, Vol. 41, No. 2, pp.119–144.
- Michelon, G. and Parbonetti, A. (2012) 'The effect of corporate governance on sustainability disclosure', *Journal of Management and Governance*, Vol. 16, No. 3, pp.477–509.
- Mitchell, C.G. and Hill, T. (2009) 'Corporate social and environmental reporting and the impact of internal environmental policy in South Africa', *Corporate Social Responsibility and Environmental Management*, Vol. 16, No. 1, pp.48–60.
- Montiel, I. and Husted, B. (2009) 'The adoption of voluntary environmental management programs in Mexico: first movers and institutional entrepreneurs', *Journal of Business Ethics*, Vol. 88, No. 2, pp.349–363.
- Moroney, R., Windsor, C. and Aw, Y.T. (2012) 'Evidence of assurance enhancing the quality of voluntary environmental disclosures: an empirical analysis', *Accounting and Finance*, Vol. 52, No. 3, pp.903–939.
- Naude, M., Quaddus, M., Rowe, A. and Nowak, M. (2011) 'Adoption of environmental standards in Australia: focus on ISO 14001', *International Journal of Sustainable Development and World Ecology*, Vol. 18, No. 5, pp.461–468.
- Neu, D., Warsame, H. and Pedwell, K. (1998) 'Managing public impressions: environmental disclosures in annual reports', *Accounting, Organizations and Society*, Vol. 23, No. 3, pp.265–282.
- Patten, D.M. (1991) 'Exposure, legitimacy, and social disclosure', *Journal of Accounting and Public Policy*, Vol. 10, No. 4, pp.297–308.
- Patten, D.M. (2002) 'Media exposure, public policy pressure, and environmental disclosure: an examination of the impact of tri data availability', *Accounting Forum*, Vol. 26, No. 2, pp.153–171.
- Perez, E.A., Ruiz, C.C., Fenech, F.C. (2007) 'Environmental management systems as an embedding mechanism: a research note', *Accounting, Auditing and Accountability Journal*, Vol. 20, No. 3, pp.403–422.
- Perry, M. and Sheng, T.T. (1999) 'An overview of trends related to environmental reporting in Singapore', *Environmental Management and Health*, Vol. 10, No. 5, pp.310–320.
- Qi, G., Zeng, S., Li, X. and Tham, C. (2012) 'Role of internalization process in defining the relationship between ISO 14001 certification and corporate environmental performance', *Corporate Social Responsibility and Environmental Management*, Vol. 19, No. 3, pp.129–140.
- Rankin, M., Windsor, C. and Wahyuni, D. (2011) 'An investigation of voluntary corporate greenhouse gas emissions reporting in a market governance system: Australian evidence', *Accounting, Auditing and Accountability Journal*, Vol. 24, No. 8, pp.1037–1070.
- Rao, K.K., Tilt, C.A. and Lester, L.H. (2012) 'Corporate governance and environmental reporting: an Australian study', *Corporate Governance*, Vol. 12, No. 2, pp.143–163.
- Reverte, C. (2009) 'Determinants of corporate social responsibility disclosure ratings by Spanish listed firms', *Journal of Business Ethics*, Vol. 88, No. 2, pp.351–366.
- Ribeiro, V.P.L. and Aibar-Guzman, C. (2010) 'Determinants of environmental accounting practices in local entities: evidence from Portugal', *Social Responsibility Journal*, Vol. 6, No. 3, pp.404–449.
- Roca, L.C. and Searcy, C. (2012) 'An analysis of indicators disclosed in corporate sustainability reports', *Journal of Cleaner Production*, Vol. 20, No. 1, pp.103–118.
- Smith, M., Yahya, K. and Amiruddin, A.M. (2007) 'Environmental disclosure and performance reporting in Malaysia', *Asian Review of Accounting*, Vol. 15, No. 2, pp.185–199.
- Spitzeck, H. (2009) 'The development of governance structures for corporate responsibility', *Corporate Governance*, Vol. 9, No. 4, pp.495–505.

- Sumiani, Y., Haslinda, Y. and Lehman, G. (2007) 'Environmental reporting in a developing country: a case study on status and implementation in Malaysia', *Journal of Cleaner Production*, Vol. 15, No. 10, pp.895–901.
- Tabachnick, B.G. and Fidell, L.S. (2007) *Using Multivariate Statistics*, 5th ed., Pearson/Allyn & Bacon, Boston, MA.
- Tilt, C.A. (2001) 'The content and disclosure of Australian corporate environmental policies', *Accounting, Auditing, and Accountability Journal*, Vol. 14, No. 2, pp.190–212.
- Ullman, A.A. (1985) 'Data in search of a theory: a critical examination of the relationship among social performance, social disclosure, and economic performance of US firms', *Academy of Management Review*, Vol. 10, No. 3, pp.540–557.
- Williams, S.M. (1999) 'Voluntary environmental and social accounting disclosure practices in the Asia Pacific Region: an international empirical test of political economy theory', *The International Journal of Accounting*, Vol. 34, No. 2, pp.209–238.
- Wiseman, J. (1982) 'An evaluation of environmental disclosures made in corporate annual reports', *Accounting, Organizations, and Society*, Vol. 7, No.1, pp.53–63.
- Yusoff, H., Lehman, G and Nasir, N.M. (2006) 'Environmental engagements through the lens of disclosure practices: a Malaysian story', *Asian Review of Accounting*, Vol. 14, No. 1, pp.122–148.

Notes

- 1 The term 'internal organisational systems' is used interchangeably with internal contextual factors.
- 2 These previous studies measure CSR disclosure from broader themes; they specifically focus on economic and social themes, including the environment (see, e.g., Ullman, 1985; Cowen et al., 1987; Kent and Monem, 2008; Mallin and Michelin, 2011). Cahaya (2006) notes that social and environmental issues are fundamentally different. Social themes examine the impact by the entity on people and communities, whereas environmental issues relate to the impact by the entity on the physical or natural environment. Rankin et al. (2011) investigate the environmental disclosure. Yet, they only focus on greenhouse gas disclosure. Current study only concentrates on environmental theme. Consistent with GRI (2006), environmental themes are measured by 30 items.
- 3 Frost et al. (2005) examine the nature and extent of sustainability reporting in the various reporting media used by Australian firms. They find the annual report to be the least valuable source of information on corporate sustainability in terms of the number of indicators and the diversity of the information provided.
- 4 The 30 indicators are derived from GRI (2006) and it is assumed that all these indicators are voluntary in each country.
- 5 Of 163 companies in this sample, 81 or 49.9% are the companies listed in the Fortune Global 500 in 2009.
- 6 Before running the multiple regression, the assumptions of regression analysis and outlier tests have been tested. This study has met the normality, multicollinearity, linearity and homoscedasticity assumptions. This study also finds that there are no outliers.