The impact of corporate attributes on the extent of voluntary disclosure and reporting by listed companies in Bangladesh

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Abstract:
The aim of this study is to determine the extent and level of voluntary reporting of the listed companies in Bangladesh. It also *explores the potential effects of* corporate governance characteristics, ownership aspects and firm characteristics *on voluntary reporting. The sample of the study consists of 123 companies with 861 firm year observations listed in the Dhaka Stock Exchange, Bangladesh for the year 2004 to 2010.* To measure the extent of reporting self-constructed checklists have been used which contains 97 items focusing on corporate social reporting, corporate environmental reporting and corporate sustainability reporting. The study found that level of total voluntary reporting in the annual reports of listed Bangladeshi companies is low. However, a gradual increase in the extent of voluntary reporting and its categories has been noticed over the period of study. Through regression analysis, the outcomes show significant positive relationship between voluntary reporting and firm size, firm's liquidity, percentage of independent directors and board structure while it has significant negative relationships with market categories, company age and number of independent directors. However, audit committee and board size have a non-significant relationship with voluntary reporting of the listed Bangladeshi companies over the examined period.

Keywords: Voluntary Reporting, Corporate Social Reporting, Corporate Environmental Reporting, Corporate Sustainability Reporting.

1. Introduction:

Voluntary reporting in the annual report refers to the information beyond the required content in the financial statements (Kumar et al. 2008) or the discretionary release of financial and non-financial information through annual reports over and above the mandatory requirements (Barako et al. 2006). *In other words,* voluntary reporting represents disclosure in excess of mandatory disclosure, and in efficient markets is likely to be provided where the marginal benefits to the provider exceed the marginal costs (Baba 2011).

The study aims to investigate the voluntary reporting practices in the annual reports; the status quo of the listed companies in a promising capital market; namely Bangladesh that lacks prior voluntary reporting studies. Furthermore, it seeks to examine empirically the association between the extent of voluntary reporting and a number of corporate governance characteristics, ownership aspects and firm characteristics. Each objective will be achieved by answering a number of research question(s). The research questions related to the study are: Do Bangladeshi companies disclose information more than the minimum required by accounting standards and regulatory requirements? Is there any association of company characteristics, corporate governance characteristics and board characteristics with the extent of voluntary reporting?

This study has chosen Bangladeshi listed companies for a variety of reasons. Firstly, Bangladesh is a developing country at a transitional stage: major reforms of corporate governance started in 2006.Secondly, Bangladesh has drawn global attention in last few years as one of the fastest growing developing country with a rapidly developing capitalist economy (UNPF 2009), and some of the hottest emerging markets (Stevenson 2008), "Frontier Five" countries (Bloomberg News 2008 as cited Abdullah et al. 2011), "Next Eleven" nations (BOI Handbook 2007).

The remainder of this paper is organised as follows. Research ontological and epistemological view, population, sample and data collection are discussed in chapter 2. Hypotheses development and model building are focused in section 3. After that, analysis and findings are presented in section 4. Finally the implications of the results obtained and its limitations are highlighted in section 5.

2. Methodology

The current research argument is based on the agency theory, stakeholder theory and signalling theory which are considered to be an important part of the positive accounting theory (descriptive research). So, an objectivism ontological position is suitable for the study. Empiricism (positivism) is the epistemological foundation of positive accounting theory. The positivist epistemology is built on an assumption of dualism between subject and object. This position believes that it is necessary to separate the subject and the object (Keat and Urry 1975). This indicates that role of the researcher is neutral showing that he/she does not influence what is being observed. Therefore, the current study follows the positive epistemological position. This position is called 'theory-neutral observational language' (Gill and Johnson 2002).

Both ontological and epistemological positions have direct impacts to the employed methodological approach. Accordingly, if the philosophical assumptions of positivism and its consequent epistemological prescriptions are accepted, a nomothetic methodology would be suitable which means that it is set out to establish law-like generalizations (Gill and Johnson 2002). Objectivism is the current research ontological position. Therefore, the functionalist would be the appropriate paradigm that fits with the current research nature and philosophy. Moreover, the deductive approach is considered to be more suitable to the present study. With reference to the objective ontological position of the current research, it is believed that a quantitative research stance would be appropriate to test the developed hypotheses. The survey technique is appropriate to this type of quantitative research and is usually associated with the deductive approach (Saunders *et al.* 2007).

As a result, the study adopts an objectivist ontology and positive epistemological position because the current research is considered to be neo-empirical research adopting a positive accounting theory (descriptive research): in this light this research relies on agency, stakeholder and signalling theory. Therefore, the study used a hypothetico-deductive methodological approach because it fits with testing the employed theory by setting a set of research hypotheses.

The data set for this study is based on panel data collected from companies listed on the Dhaka Stock Exchange of Bangladesh for the period 2004-2010. In order to compare the changes of reporting pattern before and after the corporate governance code of 2006, the study considers two years back from the cut-off point and uses data up to the year 2010. All listed companies considered for inclusive in the survey. Listed companies are considered as they have bindings to follow the rules and publish annual report. The main criteria used for sampling the firms were: firstly, the firm must have been listed for the entire period of the study (2004-2010) and secondly, annual reports must be available at the stock exchange. In order to fix the population size, the current study tracks the following simple mathematical formula: (Companies listed at the end of 31st December, 2010, less total companies listed in period from 2005 to 2010). That means companies listed and operated from 2004 to 2010(233-72= 161). Based on this criterion, a population size is 161 firms. From the population the study obtained 123 companies annual report for the seven year by using all possible sources. For this reason the total sample size is (123*7) 861 firm years.

In the current study, empirical studies depend on the designing of a checklist that includes the main issues of voluntary reporting. Furthermore, the results of the checklist would form an index of their disclosure. Current study used dichotomous procedures where a required disclosure item scores one if it is disclosed and zero if it is not disclosed. To avoid a situation where a sample company will be penalized for non-disclosure of certain items in the index which, in fact, are inapplicable to it, a 'relative index' was used (Babbie 2009, p. 172). This can be presented mathematically as follows:

$$UIx = [\sum T_{tx}] / nx$$

Where, UIx is the unweighted index scored by company, x, $0 \leq Ix \leq 1$; T_{tx} is the information item disclosed by company x; nx is the maximum number of items expected to be disclosed by a company.

For the purpose of this study, voluntary reporting will be classified as; General information, Corporate strategic information, Corporate governance/ directors information, Financial information, Financial review information, Social reporting, Environmental reporting, and Sustainability reporting. The checklist has total 97 items in 8 categories. In order to prepare the checklist the current research follows prior disclosure studies and recommendations from specialized professional organisation. At the same time it also checked whether the items are important and relevant to the context of Bangladesh.

2. Literature review and hypotheses development

Different theories, including agency theory, signaling theory, cost benefit analysis have been used to explain company voluntary disclosure (Debreceny et al. 1999; Marston and Shrives 1995). The current study addresses the voluntary disclosure and reporting practices and their determinants by the listed companies in Bangladesh, therefore, agency theory, and signaling theory will be appropriate for the study. As corporate disclosure and reporting practices can enhance the monitoring role of accounting by providing investors with easier, faster and more cost-effective access to accounting data on corporate performance. Thus it helps to reduce the adverse effect of information asymmetry which is an important driver of investors' uncertainty.

Agency theory:

Agency theory has been widely used in disclosure literature (Chow and Wong-Boren 1987; Cooke 1989, 1991, 1992; Firth 1980; Hossain et al. 1994; Nurunnabi and Monirul 2012; Bhuiyan et al. 2007; Akhtaruddin 2005; Aljifri 2008; Marston and Annika 2004). This theory also explains why managers voluntarily disclose information. Shareholders will seek to control managers' behaviour through bonding and monitoring activities. These two parties may use the level of disclosure as a way to mitigate the severity of the problem of information asymmetry which is one of the motivations of voluntary disclosure decision (Healy and Palepu 2001). Moreover, agency theory indicates that managers will disclose social information if it increases their welfare, as long as the benefits of this disclosure overweigh its associated costs (Ness and Mirza 1991).

Signaling theory:

Signaling is part of the notion of information asymmetry between management and ownership as adopted by Berle and Means (1932), which found that the level of information asymmetry is an important driver of investor uncertainty (Bollen et al. 2006). Signaling theory maintains that corporations could have an interest in providing information as a signal or mechanism that provides the market with additional information on the firm's economic reality so as to change investor expectations and reduce information asymmetries (Baiman and Verrecchia 1996). According to Morris (1987) the contribution of signaling theory is the prediction that higher quality firms will choose accounting policies which allow their superior quality to be revealed, while lower quality firms will choose accounting methods which attempt to hide their poor quality.

Firms may use level of disclosure to keep pace with other firms in the same industry. It is also argued that managers of profitable firms increase the level of disclosure to signal to investors that the firm is profitable and to support their continuation and compensation (Oyeler et al. 2003, p. 36). Debreceny et al. (2002), Ettredge et al. (2002) also indicated that a company generally tries to distinguish itself from others by signaling its specific qualities to investors.

2. Hypotheses development

2.1 Firm size

Firm size is the most common variable in disclosure literature either in developed or developing countries. The firm size of a certain corporation is considered to be the most statistically significant variable in examining the differences between voluntary reporting practices of firms (McNally *et al.* 1982, McKinnon and Dalimunthe 1993; Hossain and Adams 1995; Meek *et al.* 1995; Ahmed and Courtis 1999; Choon et al. 2000). Moreover, the previous literature offers evidences that the firm size is positively related with the extent of voluntary disclosure level (Tai et al. 1990;Lee and Morse 1990; Marston and Shrives 1991; Cooke 1992; Hossain et al. 1994; Ward 1998; Ahmed and Courtis 1999; Beiner et al. 2006; Black et al. 2006; Ghazali and Weetman 2006; Barako et al. 2006; Alsaeed 2006; Agca and Onder 2007 and Boesso and Kumar 2007; Khanchel 2007; Da Silveira et al. 2009; Uyar 2011; Samaha et a. 2012, Alves et al. 2012; Hajji and Ghazali 2013). It can be noticed that firm size is a comprehensive variable that can proxy a number of corporate attributes such as competitive advantage, information production costs, and political costs (Hossain et al. 1994 and Abdelsalam 1999, Vijayakumaran, 2015). Also, Gruning (2007) concludes that firm size has an indirect effect on disclosure which is mediated by listing status.

Many theories have been used to explain the influence of firm size on disclosure policy. Referring to agency theory, larger firms disclose more information because they have higher agency costs and they are more sensitive to political cost (Jensen and Meckling 1976; Leftwich et al. 1981). Moreover, the advocates of stakeholder theory argue that firms are expected to have a high level of voluntary disclosure in order to be registered in the stock market to attract more funds at lower cost of capital: so in this case, they have greater responsibility to provide information to customers, suppliers, analysts and government (Choi 1973; Cooke 1991). However, due to being more exposed to political attacks, Cooke (1998) indicates that large companies may respond by reducing the extent of disclosure in their annual reports. Therefore, the theoretical relationship is somewhat uncertain. Drawing on the theoretical and empirical evidence from prior studies, the current study can expect a positive relationship between the firm size and the level of voluntary reporting in the annual reports of the listed companies in Bangladesh.

H1: There is a positive significant association between firm size and the level of voluntary reporting in annual reports of the listed companies in Bangladesh.

2.2 Liquidity

A high liquidity ratio is an indicator of good management performance. Accordingly, companies with higher liquidity ratios are expected to disclose more information (Al-Akra et al. 2010). Some of the prior disclosure studies use signalling theory to explain the relation between liquidity and disclosure. According to this theory companies with a considerable or reasonable liquidity ratio may be more motivated to disclose information voluntarily to distinguish themselves from other companies that face liquidity problems (Abd El Salam 1999). On the other hand, agency theory suggests that companies with a low liquidity ratio might disclose more to satisfy the needs of shareholders and creditors (Aly et al. 2010). According to stakeholder theory, managers may be motivated to disclose more information about liquidity (Barako et al. 2006). It is hypothesized that a company's liquidity level impacts on its disclosure practices.

According to Wallace and Naser (1995), regulatory bodies, as well as investors and lenders, are particularly concerned with the going-concern status of companies. In view of this, companies that are able to meet their short-term financial obligations without a recourse to the liquidation of their assets-in-place may desire to make this known through disclosure in their annual reports (Belkaoui and Kahl 1978). Camfferman and Cooke (2002) and Ghosh and Nandi (2009) provide evidence of a positive association between liquidity and disclosure However, Wallace et al (1994) and Naser et al. (2002) report evidence of a negative association between liquidity and disclosure, while Barako et al. (2006) provide evidence of an non significant association between liquidity and voluntary disclosure.

H2: There is significant positive association between liquidity and the level of voluntary disclosure in annual reports of the listed companies of Bangladesh.

2.3 Market Category

Market category concerns the sector of the market in which the company performs. In Bangladesh there are five market categories at present. Category A indicates companies which are regular in holding the annual general meetings and have declared dividends at the rate of 10 percent or more in a calendar year. Category B includes companies which are regular in holding the Annual General Meetings but have failed to declare dividends of at least10 percent in a calendar year. Companies which have failed to hold the Annual General Meetings or failed to declare any dividend or which are not in operation continuously for more than six months or whose accumulated loss after adjustment of revenue reserve, if any, is negative and has exceeded its paid up capital are in Z category. Moreover, Category N indicates newly listed companies and G indicates Greenfield companies. The categorisation helps investors in choosing companies when making investment decision. Stock exchange security categories are all significantly associated with the extent of disclosure (Karim and Jamal 2005).

H3: There is a significant negative association between market category and the level of voluntary disclosure in the listed companies of Bangladesh.

2.4 Age of the company

The level of a firm's disclosure may be influenced by its age, i.e. stage of development and growth (Owusu-Ansah 1998; Aktharuddin 2005). Older, well-established companies are likely to disclose much more information in their annual reports than younger companies. On the other hand, younger firms might also exhibit better reporting quality since they need to compete with older firms to survive. For this study, it is expected that company age is a critical factor in determining the level of corporate disclosure. Older companies with more experience are likely to include more information in their annual reports in order to enhance their reputation and image in the market (Owusu-Ansah 1998; Akhtaruddin 2005; Dixon, Guariglia, and Vijayakumaran, 2015). Owusu-Ansah (1998) pointed out three factors that may contribute to this phenomenon. Firstly, younger companies may suffer competition, secondly, the cost and the ease of gathering, processing, and disseminating the required information may be a contributory factor, and finally, younger companies may lack a track record on which to rely for public disclosure (p. 605).

Empirical evidence is also mixed in relation to age of the firm and the level of reporting. Owusu-Ansah (1998) have found a positive association between the said variables, whereas, Akhtaruddin (2005), Alsaeed (2006) Hossain (2008), Nandi and Ghosh (2012) found no significant association. This notion is weakly supported by Black et al. (2006) and Haque et al. (2011), who report a positive, though statistically non-significant association. Owusu-Ansah and Yeho (2005) found company age as the critical factor in explaining the extent of disclosure practices. Al shammari et al. (2007) found that age does not have significant impact on corporate governance disclosure. However, Lei (2006) finds a negative association between firm age and the level of reporting.

H4: There is significant positive association between the age of the company and the level of voluntary disclosure of the listed companies.

2.5 Audit committee size

The audit committee is a subset of the corporate board of directors and has the responsibility of enhancing internal control procedures, overseeing a firm's financial-reporting process, external reporting and the risk management of companies. The audit committee acts as a monitoring mechanism and can help to improve the overall quality of information flows between managers and the different interested parties (Nandi and Ghosh 2012). Audit committees, therefore, may play a key role by facilitating communication between the board, external auditors and internal auditors (Klein 2002 and Chau and Leung 2006) which, in turn, are expected to reduce information asymmetry. The structure and characteristics of effective audit committee are currently under the spotlight to ensure reliable and high quality financial reporting (Bhuiyan et al. 2007).

Previous research provide evidence of a positive association between the presence of an audit committee and corporate reporting practices (Barako et al. 2006; Rosario and Flora 2005; Ho and Wong 2001; McMullen 1996). The board usually delegates responsibility for the oversight of financial reporting to the audit committee to enhance the breadth of relevance and reliability of annual report (Wallace et al. 1995). Thus, audit committees can be a monitoring mechanism that improves the quality of information flow between firm owners, who are in effect shareholders and potential shareholders, and managers, especially in the financial reporting environment where the two have disparate information levels (Akhtaruddin and Rouf 2011).

Previous research has examined the relationship between the presence of an audit committee and the quality of corporate reporting (Beasley 1996; DeFond and Jiambalvo 1991; McMullen 1996; Felo et al. 2003; Barako et al. 2006). The empirical evidence regarding this matter is mixed. Simnet *et al.* (1993) found that audit committees do improve or maintain the quality of the financial reporting process and improve the confidence in the quality of financial reports for financial statement user. Bradbury (1990), Pincus *et al.* (1989), Ho and Wong (2001), Akhtaruddin and Rouf (2011) supported the view that the presence of an audit committee will reduce financial reporting problems and improve the transparency and disclosure of financial reports. Goodwin and Seow (2002), and Beasley *et al.* (2000) found that investors, auditors and directors believe that a strong and effective AC is able to increase the level of quality disclosure. Ho and Wong (2001) found that companies, which have an AC, are more likely to have a higher extent of voluntary disclosure. On the other hand, Akhtaruddin *et al*. (2009) evidences insignificant positive association between size of the audit committee and the degree of corporate voluntary disclosure.

In Bangladesh, Islam et al. (2010) found that an independent audit committee is one of the important mechanisms for minimising, not only agency problems, but also the failure of different instruments of corporate governance which create so many further problems. Kamal and Ferdousi (2006) in a study of the effects of audit committees in the banking sector of Bangladesh were unable to provide information regarding the magnitude of audit committee disclosure in the annual reports. Moreover, Akhtaruddin and Rouf (2011) found positive association between audit committee and voluntary disclosure. While these studies suggest that the existence of an audit committee has an impact on financial reporting quality, they do not investigate whether audit committee *size* affect financial reporting quality.

H5: There is significant positive association between audit committee size and level of voluntary reporting in the listed companies.

2.6 Board characteristics

A corporate board is the primary and dominant internal corporate governance mechanism (Brennan 2006). The board monitors or supervises management, gives strategic guidelines to the management and may even act to review and ratify management proposal (Jonsson 2005). Large boards are usually more powerful than small boards and, hence, considered necessary for organisational effectiveness (Florackis and Ozkan 2004; Dixon, Guariglia, and Vijayakumaran, 2015). For instance, as Pearce and Zahra (1991) point out, large powerful boards help in strengthening the link between corporations and their environments, provide counsel and advice regarding strategic options for the firm and play a crucial role in creating corporate identity. Hossain (2008) has found that the board composition of a firm may be an important determinant of corporate disclosure level. Several previous research studies have found a significant association between these two variables (Haniffa and Cooke 2002; Akhtaruddin et al. 2009). In this study three board characteristics have been used- independent non-executive director, board leadership structure and board size.

2.6.1 Independent non-executive directors

A board is generally composed of inside and outside members. Kosnik (1990) and Dixon, Guariglia, and Vijayakumaran, (2015) argue that outside directors are more effective than inside directors in maximizsing shareholders' wealth. In contrast, Klein (1998) suggests that inside directors can contribute more to a firm than outside directors due to their firm-specific knowledge and expertise. According to agency theory (Jensen and Meckling 1976) board independence reduces managerial leeway thus increasing transparency and financial reporting quality.

There are mixed results concerning the relationship between independent boards of directors and corporate reporting. For example, Chau and Gray (2010), Samah and Dahawy (2010), Duchin et al. (2010), Ho and Wong (2001), Chen and Jaggi (2000), Rosenstein and Wyatt (1990), Klein (1998), Fama and Jensen (1983) find a positive relationship between independent board of directors and corporate reporting. Meanwhile, Al Shammari and Al Sultan (2010), Andres and Vallelado (2008), Barako et al. (2006), Ghazali and Weetman (2006), Haniffa and Cooke, (2002), and Ho and Wong (2001), find no relationship between independent non-executive directors and management voluntary disclosures; while, Eng and Mark (2003), Gul and Leung (2004) found a negative association. Moreover, Cheng and Courtenay (2006) found that boards with a larger proportion of independent directors are significantly and positively associated with higher levels of voluntary disclosure.

H6: There is significant positive association between independent non-executive director and level of voluntary reporting in the listed companies.

2.6.2 Board leadership structure

Within the context of corporate governance, the central issue often discussed is whether the chair of the board of directors and CEO positions should be held by different persons, a dual leadership structure or by one person, unitary leadership structure. Supporter of this view believe that duality gives a greater understanding and knowledge of the firms operating environment and this should impact positively on a firm's performance (Nandi and Ghosh 2012). While others believe that a combined chair and CEO positions signals the absence of separation in decision management and decision control (Dulacha 2007).

In the sense of the stakeholder theory and the agency theory this situation affects the independency status and the bias as this person would accumulate much power by driving two critical positions at the same time (Williams 2002 as cited in Iskander 2008). According to agency theory, the important function of a board can be damaged by the unitary leadership structure. A CEO may be engaged in some opportunistic behavior in a firm with a unitary leadership structure because of his or her dominance over the board (Rechner and Dalton 1991; Donaldson and Davis 1991; Forker 1992; Shamser and Annuar 1993, Stiles and Taylor, 1993; Blackburn 1994, Nandi and Ghosh 2012). However, there are other views, based on the stakeholder theory, suggesting that the existence of role duality would improve the board's effectiveness allowing it good control over the board and the selection of its members (Eisenhardt 1989; Dahya *et al.* 1996; Rechner and Dalton 1991; Donaldson and Davies 1991).

Therefore, it is argued that the separation of the roles of chairman and chief executive will increase monitoring quality and improve the level of disclosure (Forker 1992). However, some studies argue that there is no association between CEO duality and the extent of voluntary disclosure of information (Haniffa and Cooke 2000; Ho and Wong 2001). Rashid (2011) found that neither the board composition, nor the CEO-duality influence the firm performance. The finding of this study does not support the agency theory for board composition, implying that external, independent directors are not good for firm performance in Bangladesh. Moreover, the "CEO duality diminishes the monitoring role of the board of directors over the executive manager, and this in turn may have a negative effect on corporate performance" (Elsayed 2007, p 1204).

H7: There is significant positive association between board leadership structure and level of voluntary reporting in the listed companies.

2.6.3 Board size

Board size may influence the level of voluntary disclosure. The level of disclosure is a strategic decision made by the board of directors. As a top-level management body, the board of directors formulates policies and strategies to be followed by managers. Larger boards are better for corporate performance because they have a wide range of collective experience and expertise that may result in better decision making (Nandi and Ghosh 2012). Moreover, to maintain the agency theory logic it is recommended to raise the board size (Hermalin and Weisbach 2003). At the same time, big boards would be more diverse that would help the companies to secure critical resources and reduce environmental uncertainties (Pearce and Zahra 1992; Goodstein *et al.* 1994). Several previous research studies have found a significant association between board size on the level of corporate disclosure (Akhtaruddin *et al.* 2009; and Allegrini and

Greco 2011).

From the stakeholder theory perspective, large board size is believed to enable a high degree of independence as it enables the election of a broad range of directors that lead to diversification of the board composition. This variation addresses wider scope for the stakeholder's interests, which leads to a greater propensity to disclose more information (Williams 2002 as cited in Iskander 2008). Research emphasises the importance of strategic information and resources in a highly uncertain environment. Birnbaum (1984) suggests that uncertainty and the lack of information may be minimised by a larger board. The size of the board is believed to affect the ability of the board to monitor and evaluate management and a small board encourages faster information processing (Zahra et al. 2000).

However, other researchers put forward the opposite argument: board size needs to be reduced to improve board effectiveness (Jensen 1993; Lipton and Lorsch 1992; Kesner and Johnson 1990) and a greater number of directors on the board may reduce the likelihood of information asymmetry (Chen and Jaggi 2000). Other studies suggest that board size does affect the corporate performance and corporate disclosures (Monks and Minow 1995).

H8: There is a significant positive relationship between board size and the level of voluntary corporate disclosure of the listed companies in Bangladesh.

3. Methodology

3.1 Voluntary disclosure model specification

In order to provide primary evidence of the impact of corporate attributes on corporate voluntary reporting of different listed companies in Bangladesh, the following regression has been estimated:

Dependent variables

VDI = Voluntary Disclosure Index

Explanatory variables

Explanatory variables and their expected sign of the study are given below:

Determinants	Variable Label	Variable	Expected sign
Firm Size	LASST	Natural log of Total Assets	+
Liquidity	LIQ	Current assets-Inventories/ Current liabilities	+
Market Category	MKT	Market category of DSE, 1 for Z, 0 otherwise.	-
Firm Age	AGE	Listed year of the firm. Number of year.	+
Audit Com. Size	AUDITCOM	Audit committee percentage in the board.	+
Independent director	INDDIR	Number of independent director and proportion of independent director in the audit committee.	+
Leadership Structure	CEODU	Dummy variable 1 for CEO Duality or Role Duality, otherwise 0.	+
Board Size	**BSIZE**	**Number of board member**	+

3.2 Regression model

The following multiple linear regression model is used to investigate the association between determinants and extent of voluntary disclosure in Bangladesh:

$$VDI = \beta 0 + \beta 1\ LASST + \beta 2\ LIQ + \beta 3\ MKT + \beta 4\ AGE + \beta 5\ AUDITCOM + \beta 6\ INDDIR + \beta 7\ CEODU + \beta 8\ BSIZE + \epsilon$$

Where,

VDI= Voluntary Disclosure Index

β_0=Constant

$\beta_{1-}\beta_8$= Explanatory variables

ϵ = Errfofr term

4. Analysis and findings

The first objective is to measure the level of voluntary corporate reporting and its different categories. To measure the extent of voluntary reporting in annual reports of the listed companies of Bangladesh, the study constructed a checklist of 97 items classified into eight groups. A total of 861 annual reports of 123 companies for the years of 2004 to 2010 have been analysed using this checklist.

To start the analysis, appendix A presents the descriptive statistics of the total voluntary reporting and its categories for each year and for the seven years all together indicates that the mean of total voluntary reporting score over the seven years is about 28.56%. This average suggests a low level of voluntary reporting. Descriptive statistics also indicates that the extent of voluntary reporting over the years has a wide range but is increasing year by year. While the minimum reporting index obtained is 7.22% for the year 2004 to 2007, the maximum is 70.10% for the year 2009 and 2010. This result confirms the wide variation in the voluntary reporting practices in the annual reports of listed Bangladeshi companies. In addition, it justifies the decision to focus the current study on the extent of voluntary reporting practices.

The study also found that the variation in the level of voluntary reporting categories over the period of study. It can be seen from table that there is a gradual increase in the average score of before (2004-05, 25.19%) and after (2007-10, 30.64%) the Corporate Governance Code of 2006. However; the increasing rate differs among the categories. Corporate social responsibility average reporting over the period is 17.03%. From the overall data it is clearly observed that CSR is gradually increasing over the period from 2004 to 2010 but is still not up to the desired standard as the highest average is only 24.16%.

Corporate environmental reporting (CER) is the least focused area of all the categories of voluntary reporting: here average reporting over the period is 4.21% with a maximum of 61.54% and a minimum of 0%. Highest average CER reporting found in 2010 is 6.57% whereas the lowest average found in 2004 is 2.44%, indicating a growth of 169.26% over the period. From the overall data, it is clearly observed that CER is gradually increasing over the period from 2004 to 2010 but not up to the standard as the highest average is only 6.57%.

Very few researchers have focused on corporate sustainability reporting in Bangladesh and the term is relatively new in the voluntary reporting family where average reporting over the period is 14.33% with maximum 53.33% and minimum 0%. Throughout the period current period found minimum sustainability reporting disclosure was 0% just like CSR and CER: again this means sustainability reporting is absent in reports by some companies in every year. Highest average sustainability reporting found in 2010 is 16.72% whereas the lowest average 11.33% was found in 2004.

4.1 Sector wise voluntary reporting

From previous discussions it is already understand that average voluntary reporting is relatively low (28.56%) in Bangladesh. In order to obtain a detailed overview, it is necessary to discuss the sector wise voluntary reporting pattern of the listed companies in Bangladesh. No previous studies in Bangladesh consider different sectors to analyse voluntary reporting performance.

From the table 1, it is observed that highest voluntary reporting over the period of time is found in Banks (48.05%) followed by Financial Institutions (41.14%). On the other hand worst voluntary reporting pattern is found in Services and Real Estate, Tannery sectors (15.12%). In addition, voluntary reporting pattern of Ceramic, Jute, Paper and Printing and Miscellaneous sectors are all below 20%.

4.2 Voluntary reporting before and after the code

If the study focuses on the difference between before and after the Corporate Governance Code of 2006, table 2 clearly justifies its effect. It is observed that the average voluntary reporting of 2004 to 2005 is 25.19% which is lower than the

Table 1: Sector wise total voluntary reporting

Sectors	Voluntary Reporting
Bank	48.05%
Cement	32.02%
Ceramic	15.76%
Engineering	23.85%
Financial Institution	41.14%
Food & Allied	22.15%
Insurance	24.15%
IT Sector	19.11%
Jute , Paper and Printing	15.71%
Pharmaceuticals and Chemicals	31.97%
Services and Real Estate, Tannery	15.12%
Textile	21.82%
Miscellaneous	19.20%

30.64% average of 2007 to 2010. This can be understood as the effect of Corporate Governance Code, issued 2006, in which year current study find reporting standing at 27.01%. This justification also is observed if

Table 2: Average voluntary reporting before and after the code

Reporting	2004-05	2006	2007-2010
Voluntary Reporting	25.19%	27.01%	30.64%
General Information	76.89%	78.98%	82.96%
Corporate Strategic Information	29.68%	32.85%	42.56%
Corporate Governance Information	47.39%	48.66%	53.45%
Financial Information	55.37%	57.56%	59.56%
Financial Review Information	46.21%	47.15%	49.81%
Social Responsibility	11.86%	14.54%	20.24%
Environmental Reporting	2.57%	3.19%	5.29%
Sustainability Reporting	11.58%	13.58%	15.84%

the study looks the different categories of voluntary reporting.

Now, it is necessary to identify whether this difference between total voluntary reporting over the period under investigation and before and after the code is significant or not. Testing for normality is essential to determine the type of tests to be used (parametric tests or non-parametric tests). After conducting a series of statistical tests, the results indicate that voluntary reporting data are not normally distributed, so nonparametric tests are recommended. For this study, significance test has been measured by Kruskal-Wallis tests for over the period and Wilcoxon Matched-pairs Signed Rank test for before and after the code period.

Regarding the differences among the seven years, Kruskal-Wallis test indicate that there is significant difference between voluntary reporting over the period. Again to test the effect of corporate governance code 2006 on the extent of voluntary reporting, Wilcoxon Matched-pairs Signed Rank test indicate that there is significant difference of voluntary reporting before and after the corporate governance code.

Table 3: Kruskal-Wallis and Wilcoxon Matched-pairs signed rank test

Kruskal-Wallis test		Wilcoxon signed-rank test
Chi-squared =	28.700 with 6 d.f.	Ho: before = after
probability =	0.0001	z = -2.666
Chi-squared with ties =	28.727 with 6 d.f.	Prob > z = 0.0077
probability =	0.0001	

From the descriptive analysis it is observed that extent of voluntary reporting is improving over the period and this increase is sufficient to be statistically significant especially before and after the corporate governance code.

4.3 Descriptive statistics of voluntary reporting:

Table 4 shows the descriptive statistics of total voluntary reporting level and the level of each of the voluntary reporting categories for year 2004-2010. The total voluntary reporting level presents 28.60% of the examined checklist items with a variant of between 7.20% and 70.10% for the least and highest Bangladeshi companies reporting respectively. Moreover, the general information represents the highest reporting level of 80.70%, while the environmental reporting disclosure presents the lowest reporting level of 4.20 %. In addition, it is observed that the maximum reporting of all categories is 100% presented by general information, corporate strategic and financial review reporting. As found previously, for the whole categories of reporting, again the minimum reporting for any category of reporting is 0%, which means that at least one of the examined companies missed corporate strategic, financial review, social responsibility, environmental and sustainability reporting in their annual report.

Table: 4 Descriptive statistics of voluntary data

	N	Mean	Median	Std. Deviation	Mini-mum	Maxi-mum	Skew-ness	Kur-tosis
Voluntary Reporting	861	0.286	0.2371	0.141	0.072	0.7010	0.7938	**2.672**
General Information	861	0.807	0.8571	0.175	0.286	1	-0.4296	**2.139**
Corporate Strategic	861	0.375	0.4	0.278	0	1	0.1754	**1.867**
Corporate Governance	861	0.511	0.4285	0.232	0.1428	1.1428	0.4893	**2.252**
Financial Information	861	0.583	0.6	0.216	0.2	1.4	0.1099	**3.117**
Financial Review	861	0.484	0.5	0.233	0	1	0.1858	**2.117**
Social Responsibility	861	0.17	0	0.242	0	0.8888	1.2339	**3.155**
Environmental	861	0.042	0	0.099	0	0.6153	2.9079	**12.513**
Sustainability	**861**	**0.1430**	**0.10**	**0.1079**	**0**	**0.5333**	**0.7555**	**2.9809**

Moreover, in relation to standard skewness statistics the presented data is not normally distributed. As a common rule, the standard skewness of the data needs to be within the range of ±1.96 (Gujarati and Dawn 2009). It is observed that environmental reporting is more than 1.96 evidencing that the data is not normally distributed. On the other hand, with respect to the standard kurtosis, the data is also not normally distributed. The data is said to be normally distributed if the standard kurtosis fall in the range of ±3 (Gujarati and Dawn 2009). The standard kurtosis of the total voluntary reporting and its different categories has a value more than 3, indicating that the data is not normally distributed. As a result any hypotheses test related to the entire data needs to use a robust analysis.

4.4 Measuring the determinants of voluntary reporting

This section examines the relationship between voluntary reporting level and the determinants of this voluntary reporting. The determinants of voluntary reporting that are examined in this model are: firm size, firm liquidity, market categories, company age, audit committee, number of independent directors, independent director percentage on the board, board structure and board size.

Table 5: Descriptive statistics of Voluntary reporting determinants

	N	Mean	Median	Std. Deviation	Mini-mum	Maxi-mum	Skew-ness	Kur-tosis
Firm Size	861	9.250	8.996	.879	6.43	11.77	.459	2.530
Liquidity	861	1.723	1.363	1.656	.02	17.00	3.775	26.345
Market Categories	861	.223	.000	.416	0	1	1.333	2.771
Company Age	861	14.518	14.000	7.951	0	44.00	.501	3.005
Audit Committee	861	.194	.143	.223	0	1.00	.896	3.088
Ind. Director(number)	861	.520	.000	.639	0	4.00	1.158	4.782
Ind. Director (%)	861	.124	.000	.176	0	1	1.256	4.615
Board Structure	861	.777	1.000	.421	0	1	-1.283	2.647
Board Size	861	10.747	9.000	6.434	3.00	37.00	1.518	5.132

As indicated in table 5, the mean firm size is about 9.250 with minimum 6.43 and maximum 11.77. Also liquidity measured by quick assets divided by current liabilities is 1.723: 1, which indicates that on average companies have 1.723 times of quick assets to repay its current liabilities. It is also notable that 22.30% of observations are in Z categories, the audit committee is 19.4% of the board and 77.7% observation have dual leadership structure. Regarding the presence of independent directors, nearly 50% companies do not have independent director and independent director size is only 12.4 % of the board. The average number of board of director is around 11 people. Moreover, companies in the sample observations have on average operated in the market for 15 years.

The skewness of the different determinants indicates that the data of the different variables are not normally distributed. The maximum skewness is 3.375 represented by liquidity, while the minimum skewness is -1.283 represented by board structure. The maximum skewness is not within the skewness range of ±1.96 which indicates the non normality of the data (Gujarati and Dawn 2009). Therefore, based on the skewness, the data of the different variables is not normally distributed and considered to be non parametric data.

The kurtosis shows that the minimum kurtosis is 2.530 which represented by the firm size, while the maximum kurtosis is 26.345 represented by firm liquidity. Since the minimum and maximum kurtosis are not within the range of ±3 (Gujarati and Dawn 2009). Therefore the data is not normally distributed and the data is considered to be non parametric. So, observations have some extreme figures (outliers) which need more attention during the analysis process and the interpretation of the results.

4.5 Bivariate analysis

The correlation between the different categories of voluntary reporting and the determinants of reporting is shown using Spearman correlation coefficients in the table 6. The Spearman correlations in table 6 show the significance association between the total and different categories of reporting with the different determinants of this type of reporting. The significance association is identified using a confidence level of 99% and 95%. Referred to the correlation coefficients, there is a significant positive relationship (at 1 % and 5% significance levels) between total voluntary reporting and firm size, firm profitability, audit committee, independent director percentage, board structure and board size. This suggests the stronger association between these variables and voluntary reporting. According to the results, companies with big size, high profitability, audit committee members in the board, high percentage of independent directors in the board, dual leadership structure and large board size disclose more voluntary information in their annual reports.

On the other hand, number of independent director in the board is identified to have a non-significant relationship with voluntary reporting. The results indicate weak or no association between voluntary reporting and number of independent directors in the board.

However, there is a significant negative association between market category, company age, and voluntary reporting. This indicates companies listed in the Z category and old companies rather than new companies disclose less voluntary information in their annual reports. The results of this table agree with the research hypothesis regarding the association between voluntary reporting and the different reporting determinants.

Table 6: Spearman's correlations of independent and dependent variables

	Voluntary	Gen-Eral	Cor. Strat.	Cor. Gover.	Fina-ncial	Finan. review	CSR	CER	Sustain ability	Size	Profit-ability	Market Cat.	Age	Audit Com.	Indir. Num.	Indir. %	Board Struct	Board Size
Total Vol. reporting	1.000																	
General reporting	.769**	1.000																
Corporate Strategic	.744**	.618**	1.000															
Corporate governance	.784**	.656**	.542**	1.000														
Financial reporting	.733**	.556**	.564**	.577**	1.000													
Financial review	.801**	.500**	.516**	.533**	.585**	1.000												
Corporate Social	.837**	.542**	.635**	.630**	.617**	.649**	1.000											
Cor. Environmental	.493**	.247**	.314**	.258**	.307**	.367**	.518**	1.000										
Sustainability	.842**	.636**	.553**	.647**	.501**	.575**	.667**	.408**	1.000									
Firm Size	.683**	.556**	.564**	.617**	.540**	.556**	.656**	.257**	.534**	1.000								
Firm Profitability	.402**	.460**	.275**	.437**	.244**	.259**	.289**	-.002	.423**	.257**	1.000							
Market Category	-.364**	-.333**	-.175**	-.331**	-.310**	-.286**	-.276**	-.115**	-.285**	-.359**	-.380**	1.000						
Company Age	-.073*	-.065	-.031	-.102**	-.050	-.151**	-.062	.081*	-.047	.065	-.208**	-.055	1.000					
Audit committee	.242**	.179**	.300**	.203**	.193**	.189**	.178**	.181**	.146**	.202**	.001	-.139**	.230**	1.000				
Ind. Dir. number	.046	.105**	.075*	.106**	.035	-.086*	-.057	.057	.010	-.030	-.019	-.152**	.262**	.540**	1.000			
Ind. Dir. Percentage.	.111**	.100**	.171**	.131**	.069*	-.009	.032	.131**	.065	.013	-.035	-.119**	.271**	.719**	.804**	1.000		
Board Structure	.301**	.303**	.182**	.353**	.225**	.150**	.223**	.069*	.319**	.258**	.216**	-.224**	-.170**	.027	.108**	.011	1.000	
Board size	.366**	.484**	.229**	.498**	.208**	.161**	.228**	-.026	.379**	.316**	.461**	-.350**	-.224**	-.122**	.088**	-.005	.471**	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.6 Choosing between fixed and random Effects

When modeling group data, perhaps the first question the researcher faces is whether to account for unit effects and, if so, whether to employ so called fixed effects or random effects. Advice on this topic is plentiful (e.g., Greene 2008, Kennedy 2003, Frees 2004, Gelman 2005, Wilson and Butler 2007, Arceneaux and Nickerson 2009, Wooldridge 2010), even if sometimes confusing and contradictory (Gelman and Hill 2007, 245). However, the generally accepted way of choosing between fixed and random effects is running a Hausman test. The Hausman test checks a more efficient model against a less efficient but consistent model to make sure that the more efficient model also gives consistent results (James and Marks 2012).

Table 7: Hausman test of dependent and explanatory variables

	Hausman fixed random	
	chi^2	Prob>chi^2
Voluntary Reporting	5.20	0.8168
General Information	0.28	1.0000
Corporate Strategic	12.53	0.1852
Corporate Governance	7.60	0.5752
Corporate Financial	1.26	0.9986
Financial Review	1.57	0.9966
Corporate Social	15.79	0.0714
Corporate Environmental	0.89	0.9996
Corporate Sustainability	8.91	0.4452

In the case of Hausman fixed random, if the Prob>chi^2 value is more than 0.05 then it is safe to use random effects (James and Marks 2012). From the table 7.14, as Prob>chi^2 is more than 0.05, the current study goes for random test.

4.7 Test of hypotheses

Regression diagnostics indicate that data set are non linear, non normal and there are heteroscedasticity in the current study. There are several reasons for this case of unequal variance, e.g. outliers and skewness. Ordinary Least Squares (OLS) does not make use of the information contained in the unequal variability of the dependent variable since it assigns equal weight to each observation. The descriptive statistics also showed that the data is not normally distributed. Therefore, the data analysis needs to be applied using a nonparametric test that fits with this non parametric data not normally distributed. The GLS is a parametric test, so to fit with the non parametric data it needs to be employed using robust standard error.

To benefit from the advantages of panel data analysis, the current study employed GLS using robust standard error. The results of table 8 show that total voluntary reporting has positive association ($p \leq 0.01$) with firm size, firm liquidity, percentage of audit committee member, percentage of independent director, board structure and board size: it is negatively associated *($p \leq 0.01$)* with market categories, company age and number of independent director. The positive associations mean that *voluntary* reporting increases with the increase of firm size, firm liquidity, high percentage of audit committee members, high proportion of independent directors in the board, role duality of the organisation and having large number of board members. On the other, the negative associations mean that the companies that disclose less voluntary reporting are those in Z categories, old companies rather than new companies, and those having large numbers of independent directors in the board.

However, according to the results indicated in table 8, there is a significant relationship *($p \leq 0.01$)* between voluntary reporting and firm size, firm liquidity, market categories, company age, number of independent directors, percentage of independent directors, and board structure. On the other hand, there is a non-significant relationship of voluntary reporting with audit committee, and board size. The adjusted R Squared of the models explains how much of the changes in the dependent variable are explained by the changes in the independent variables. The R Squared is 0.6217 indicating that 62.17% of the changes of the total voluntary reporting is explained by the changes in its examined determinants. The R-squared is comparable to Depoers (2000) 65%; Abdel-Fattah (2008) 63% and higher than Haniffa and Cooke (2002) 47.9% and Barako et al. (2006) 53.4%; however, it is lower than Hassan et al. (2006) 86.3%.

Consistent with H1, the study found a statistically significant positive relationship between voluntary reporting and firm size. This suggests that large firms tend to disclose more voluntary information than smaller firms in their annual reports. Findings of the study, supported by stakeholder theory, show that firms are expected to have high levels of voluntary disclosure in order to be registered in the stock market: this attracts more funds at lower capirtal cost of: in this case they have a greater responsibility to provide information to customers, suppliers, analysts and government (Choi 1973; Cooke 1991). This result is in line with prior studies of Black et al. 2006; Ghazali and Weetman 2006; Barako et al. 2006; Alsaeed 2006; Agca and Onder 2007 and Boesso and Kumar 2007; Khanchel 2007; Da Silveira et al. 2009; Uyar 2011; Samaha et al. 2012, Alves et al. 2012; Hajji and Ghazali 2013.

Consistent with H2, the study found a statistically significant positive relationship between voluntary reporting and firm liquidity. The result indicates that companies with higher liquidity are expected to disclose more voluntary information. Findings of the study are supported by signaling theory: companies with considerable or reasonable liquidity ratio may be more motivated to disclose information voluntarily to distinguish themselves from other companies that face liquidity problems (Abd El Salam 1999). This result is similar to the conclusions of Wallace and Naser 1995; Camfferman and Cooke 2002; Ghosh and Nandi 2009 and Al-Akra et al. 2010.

Consistent with H3, market categories have a statistically significant negative relationship with voluntary reporting. Findings of the study suggest that Z category companies disclose less voluntary information in their annual reports which is supported by signaling theory, suggesting firms intend to disclose less information about their poor performance. This result is supported by Karim and Jamal 2005.

Inconsistent with H4, the results from panel regression do not accept the hypothesis and found significant negative relationship between voluntary reporting and company age. This indicates that old companies disclose less voluntary information. It may be that younger firms exhibit better reporting quality since they need to compete with older firms to survive. This result is in line with Lei (2006).

Inconsistent with H5, the results do not accept the hypothesis and found non-significant relationship between voluntary reporting and audit committee. The result indicates that audit committee size does not affect voluntary reporting quality. As an audit committee with at least three members is mandatory for Bangladesh, whether the number increases or not does not affect the voluntary reporting pattern of the firms. This result is similar with the conclusions of Eng and Mak 2003; Akhtartuddin *et al*. 2009.

Consistent with H6, the study found a statistically significant positive relationship between voluntary reporting and independent directors. That means companies which have a high proportion of independent directors in the audit committee disclose more voluntary information in the annual report. The result is in line with Chau and Gray 2010; Samah and Dahawy 2010; Duchin et al. 2010; Akhtaruddin et al. 2009; Cheng and Courtenay 2006; Ho and Wong 2001; Chen and Jaggi 2000; Rosenstein and Wyatt 1990 and Klein 1998. However, the results also found that the number of independent directors has a significant negative relationship with the voluntary reporting, which is also supported by Eng and Mark 2003; Gul and Leung 2004.

Consistent with H7, there is a statistically significant positive relationship with board structure and voluntary reporting. Result indicates that duality gives a greater understanding of the firms operating environment and impacts positively on the firm's voluntary reporting. Based on agency theory, the existence of role duality would improve the board effectiveness in performing a good control on the board and reporting (Eisenhardt 1989; Dahya *et al.* 1996; Rechner and Dalton 1991; Donaldson and Davies 1991). This result is similar with the conclusions of Forker 1992; Nandi and Ghosh 2012; Gao and Kling 2012.

Inconsistent with H8, the results does not accept the hypothesis and found a non-significant relationship between voluntary reporting and board size. The findings of panel regression indicate that the number of board member does not have any influence in voluntary reporting. In this area the findings of the study do not support agency theory or stakeholder theory. This is due either to the number of inactive members on the board or the large number of family members on the board. However, this result is similar with the conclusions of Cheng and Courtenay 2006.

4.8 Sensitivity analysis

Table 8: GLS regression using robust standard error

	Voluntary		General		Corporate Governance		Corporate Strategy		Financial		Financial Review		CSR		CER		Sustainability	
	Coeffici	Z	Coeffici	Z	Coeffici	Z	Coeffiici	Z	Coeffci.	Z	Coeffci.	Z	Coeffci.	Z	Coeffci.	Z	Coeffci.	**Z**
Firm Size	0.115***	20.79	0.092***	30.18	0.196***	55.33	0.152***	33.13	0.118***	50.82	0.147***	56.66	0.206***	0.206	0.028***	3.53	0.067***	**15.71**
Liquidity	0.006***	2.98	0.011***	2.96	0.005	1.31	0.013***	3.41	-0.004*	-1.8	0.003	1.5	0.005**	0.005	0.000	-0.01	0.010***	**5.94**
Mkt Categories	-0.015***	-4.91	-0.033***	-4.14	0.041***	3.8	-0.008	-1	-0.071***	-7.42	-0.072***	-10.28	0.000	0.000	-0.007**	-2.2	-0.001	**-0.31**
Company Age	-0.001***	-4.91	-0.001**	-2.47	-0.003***	-7.78	-0.001***	-3.8	-0.003***	-5.62	-0.005***	-9.89	-0.002***	-0.002	0.001***	3.16	0.000**	**2.14**
Audit Committee	0.002	0.13	0.056***	2.56	0.079**	2.49	0.028	1.45	-0.001	-0.04	0.078***	5.08	-0.046	-0.046	-0.010	-0.95	-0.025**	**-2.56**
Ind. Dir.(num)	-0.015***	-2.99	0.016	1.55	-0.029*	-1.87	0.009	1.03	-0.001	-0.09	-0.041***	-4.9	-0.032***	-0.032	-0.006	-0.99	-0.013***	**-3.01**
Ind. Dir. (%)	0.139***	5.97	0.042	1.41	0.313***	7.89	0.179***	4.72	0.134***	4.42	0.082**	2.35	0.224***	0.224	0.109***	4.99	0.108***	**5.75**
Board Structure	0.024***	6.41	0.007***	2.64	0.013**	2.19	0.038***	3.86	0.033**	2.16	0.006	0.62	0.036***	0.036	0.018***	7.21	0.028***	**16.99**
Board Size	0.000	0.06	0.007***	13.91	-0.002	-1.51	0.007***	4.73	-0.003***	-4.71	-0.004***	-13.2	-0.002**	-0.002	-0.002***	-7.33	0.001*	**1.71**
Constant	-0.793	-14.67	-0.152	-4.62	-1.444	-39.06	-1.034	-15.81	-0.462	-14.53	-0.751	-27.2	-1.718	-1.718	-0.234	-3.72	-0.537	**-12.32**
Adjusted R square	**0.6217**		**0.4326**		**0.4181**		**0.5211**		**0.3351**		**0.4176**		**0.5913**		**0.1293**		**0.4349**	

Random-effects GLS regression	Number of observation = 861
Observation per group: Minimum = 123; Average = 123; Maximum = 123	

voluntary reporting and its categories

Year	Descriptive Statistics	Voluntary	General	Corporate Strategic	Corporate Governance	Financial	Financial Review	Social Responsibility	Environ-mental	Sustain-ability
2010	Mean	0.3227	0.8420	0.4472	0.5528	0.6033	0.5054	0.2416	0.0657	**0.1672**
	Minimum	0.0928	0.4286	0	0.1429	0.2000	0.0833	0	0	**0**
	Maximum	0.7010	1	1	1	1.4000	1	0.8889	0.6154	**0.5333**
2009	Mean	0.3151	0.8386	0.4455	0.5470	0.6000	0.5047	0.2200	0.0575	**0.1623**
	Minimum	0.0928	0.4286	0	0.1429	0.2000	0.0833	0	0	**0**
	Maximum	0.7010	1	1	1	1	1	0.8889	0.6154	**0.5333**
2008	Mean	0.3022	0.8293	0.4260	0.5296	0.5935	0.4973	0.1879	0.0513	**0.1561**
	Minimum	0.0928	0.4286	0	0.1429	0.2000	0.0833	0	0	**0**
	Maximum	0.6598	1	1	1	1.4000	1	0.8333	0.6154	**0.4667**
2007	Mean	0.2854	0.8084	0.3837	0.5087	0.5854	0.4851	0.1599	0.0369	**0.1480**
	Minimum	0.0722	0.2857	0	0.1429	0.2000	0	0	0	**0**
	Maximum	0.6289	1	1	1	1.0000	1	0.8333	0.6154	**0.4667**
2006	Mean	0.2701	0.7898	0.3285	0.4866	0.5756	0.4715	0.1454	0.0319	**0.1358**
	Minimum	0.0722	0.2857	0	0.1429	0.2000	0	0	0	**0**
	Maximum	0.5773	1	1	1	1.0000	1	0.7778	0.5385	**0.4000**
2005	Mean	0.2546	0.7712	0.2992	0.4762	0.5561	0.4641	0.1238	0.0269	**0.1182**
	Minimum	0.0722	0.2857	0	0.1429	0.2000	0	0	0	**0**
	Maximum	0.5464	1	0.8000	1	1	1	0.7778	0.5385	**0.3667**
2004	Mean	0.2492	0.7666	0.2943	0.4715	0.5512	0.4600	0.1134	0.0244	**0.1133**
	Minimum	0.0722	0.2857	0	0.1429	0.2000	0	0	0	**0**
	Maximum	0.5361	1	0.800	1	1	1	0.7222	0.5385	**0.3333**
Grand Total	Mean	0.2856	0.8065	0.3749	0.5104	0.5803	0.4840	0.1703	0.0421	**0.1430**
	Minimum	0.0722	0.2857	0	0.1429	0.2000	0	0	0	**0**
	Maximum	**0.7010**	**1**	**1**	**1**	**1.0000**	**1**	**0.8889**	**0.6154**	**0.5333**

The main objective of the sensitivity analysis is to examine how sensitive the results and findings are towards changing the statistical test. Regarding the results of adjusted R square of GLS fixed were similar to the GLS random indicating that GLS fixed regression has the same strength as the main GLS random regression. Also, GLS fixed regression showed the similar adjusted R square with GLS random for different parts of voluntary reporting.

The results of the GLS fixed regression showed that the results of the GLS random data analysis are not sensitive to changing the type of the test. Hence, the selected GLS random analysis is considered to be well matched with the examined data. Moreover, the results of this sensitivity analysis confirm the reliability of the results and findings which supports the generalization of such results.

4.5 Conclusion

This study examines the extent and level of voluntary reporting in the annual report of the listed companies in Bangladesh over the period of 2004 to 2010. It also investigates the association between voluntary reporting and the determinants; firm size, firm liquidity, market categories, company age, audit committee, independent directors, board structure and board size. Findings of the study also focused on CSR, CER and sustainability reporting and sector wise performance. As expected in developing countries, the first part of findings indicates that the level of total voluntary reporting in the annual reports of listed Bangladeshi companies is low. However, a gradual increase in the extent of voluntary reporting and its categories has been noticed over the period of study. Statistical tests indicate significant differences between voluntary reporting scores over the seven years. This may be due to the indirect effect of the Corporate Governance Code, a desire to enhance corporate image and the opportunity to receive government support.

Based on the findings of the empirical section, it is concluded that there is a significant positive relationship between voluntary reporting and firm size, firm's liquidity, percentage of independent directors and board structure and significant negative relationships with market categories, company age and number of independent directors. In addition to this, audit committee and board size have a non-significant or no relationship with voluntary reporting in the annual reports of listed Bangladeshi companies over the examined period.

The findings of the study agree with the research hypotheses concerning the existence of positive significant relationship between voluntary reporting and firm size, firm liquidity, percentage of independent directors and a significant negative relationship with market categories. However, the results of the panel regression analysis does not accept the hypothesis, and found a significant negative relationship of voluntary reporting with company age, independent director numbers, and a significant positive relationship with board structure and an non-significant relationship with audit committee and board size. This study also explores the factors affecting different parts of voluntary reporting which is a new area of study relating to voluntary reporting for developing country especially Bangladesh.

Appendix A: Descriptive statistics of

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