Extent and determinants of corporate voluntary reporting: An empirical investigation of listed non-financial companies in Bangladesh

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Abstract

The aim of this study is to determine the extent and trend of voluntary reporting practices on the internet by the listed non financial companies in Bangladesh. It also identifies the factors that influenced the voluntary reporting on the internet. The final sample consists of 141 non financial companies listed in the Dhaka Stock Exchange, Bangladesh. This study used self constructed checklists of 128 items divided into nine groups. Current study observed that the mean of the total voluntary disclosure score for the sample is about 29.50% with highest disclosure in the telecommunication sector which is 55.47% where as tannery sector discloses the lowest; only 22.40%. The result of the regression analysis found that the total voluntary disclosure has significant positive association with firm size, audit firm's international link, multinational parent, independent director in the board and dual leadership structure whereas significant negative association with the firms profitability and firm leverage. However, board size, ownership structure, company's liquidity and company age have non-significant association with voluntary reporting on the internet. The value of adjusted R square indicates that 46.5% of the changes of total voluntary disclosure are explained by the changes in its examined determinants.

Keywords: *Voluntary disclosure, Internet reporting, Non-financial companies and Bangladesh.*

1. Introduction

Financial reporting can be defined in terms of those for whom the reports are intended. At one end of the spectrum are the annual financial statements of an organisation, which are the prime means of demonstrating its responsibility to its stakeholders; while at the other end are the internal reports, aimed at providing information for decision-making by managers (Soper and Dolphin 1964 as cited in Abubakar 2010). To meet the information needs of users, companies in the developed countries started to disclose financial and non-financial information on the internet.The current competitive environment is requiring more useful accounting information and so investors, social agents, clients, suppliers and other interest groups are demanding more and more relevant, comparative accounting information. Currently companies are also concerned to disclose information beyond that which is mandatory to attract investors as well as to improve their image and reputation. In this context, the dissemination of accounting information on the internet is adding a new dimension to corporate reporting (Bonson and Tomas 2002).

Given the increasing use of internet reporting, these constituents of financial reporting will need to develop new strategies to pro-actively respond to financial reports, including auditors' reports on the internet. If policy makers encourage firms to adopt better disclosure technologies it should make markets more transparent (Debreceny et al. 2002). Substantial accounting literature has emerged in the last thirty years that explains corporate financial reporting behaviour. Most of the empirical studies are performed on different developed countries. In contrast, very little is known about the disclosure of financial information on the internet by companies in developing countries. As a result there is an increasing need to describe the current situation of financial reporting on the internet in the developing world. The purpose of this study is to investigate the determinants and extent of voluntary disclosure on the internet by the listed non-financial companies in Bangladesh. It provides an understanding of the present state of delivery of business information on the internet in Bangladesh. The research finding is essential as it assists in informing regulators about the characteristics of companies that are, and that are not, satisfying national and international investors' demand for online information.

The remainder of this paper is organised as follows. Importance of the study highlighted in section 2. Section 3 discusses the literature on voluntary reporting on the internet. Section 4 highlights the relevant theories of the study. Data, research design, and variable measurement techniques have been outlined in section 5. After that analysis and findings are presented in section 6. Finally the implications of the results obtained and its limitations are highlighted in section 7.

2. Importance of the study in Bangladesh

Healy and Palepu (2001, p. 432),argued that "The internet provides management with the opportunity to access all investors and to provide daily updates of important information." Thus, a firm can improve its disclosure transparency through use of internet financial reporting (Kelton and Yang 2008).The Transparency International Bureau stated that hiding information is a common phenomenon in Bangladesh and that companies are no exception. To be transparent and more accountable to stakeholders, companies need to provide detailed information. It is quite shocking that the stock market crashes in 1996 and 2011 also revealed the same picture of the traditional culture not providing enough information to investors and insider information being the key to gain abnormal returns (Nurunnabi and Monirul 2012). Bangladesh is no exception to the fact that computer technology has changed the flow of information between firms that provide and consumers who demand information (Bhuiyan et al. 2007).

Internet reporting is an emerging issue in Bangladesh and there is ample room for improvements in order to utilise the full potential of the internet. As more and more people in Bangladesh are connecting themselves to the information superhighway, companies are expected to change their internet reporting practices, in terms of content and disclosure. To the extent that more extensive use of the internet for information disclosure can improve the efficiency of the corporate disclosure regime, it is expected that more companies will improve their internet reporting practices. Even smaller companies that wish to expand further and attract investors (domestic and foreign) are expected to use the internet as an alternative channel to distribute information faster and cheaper.

The practice of using the internet for disseminating corporate information is relatively new in Bangladesh. Since Bangladesh needs external capital to sustain the high growth rate and the biggest agency problem centers on asymmetric information and expropriation by majority shareholders, it is very important for firms to be transparent and make full disclosure of information. However, given the growing importance of the internet and its evident relevance to corporate reporting, it has become important to investigate the type of corporate reporting practices that have been adopted by Bangladeshi non-financial companies. In particular, lack of a comprehensive study of corporate reporting on the internet in Bangladesh, an important developing country, is the primary motivator for this study. So, the purpose of this study is to investigate the extent of voluntary disclosure on the internet and their determinants.

3. Theoretical framework

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 practices on the internet and their determinants by the listed non-financial companies in Bangladesh, therefore, agency theory, and signaling theory will be appropriate for the study. As corporate internet reporting can enhance the monitoring role of accounting by providing investors with easier, faster and more cost-effective access to accounting data on corporate performance, it may possible that in this classic set-up model a risk adverse agent may voluntarily and frequently provide information through internet reporting in order to reduce monitoring costs and to encourage outside investors to invest in the company. 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; Dixon, Guariglia, Vijayakumaran, 2015). 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; Vijayakumaran, 2015). 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.

Again, firms may use internet disclosure to keep pace with other firms in the same industry. Craven and Marston (1999, p. 323) stated that: "the very use of the internet might itself be a signal of high quality. It implies that the firm is modern and up-to-date with the latest technology rather than old fashioned and conservative." 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.

4. Empirical review

The internet offers companies "new opportunities to supplement, replace and enhance traditional ways of investor and stakeholder communication" (Marston and Annika 2004, p. 286), and therefore, it has become, in a very short time, an "indispensable communication tool for organisations" (Capriotti and Moreno 2007, p. 224). As academic researchers have recognised the internet as an emerging communication medium, the number of studies focusing on the use of the internet for corporate reporting can be divided into three categories: descriptive, comparative and explanatory. Descriptive research focuses on the number of firms using the web as a medium to disseminate information and to what extent these firms include financial information on their web sites (Gowthorpe and Amat 1999; Deller et al. 1999; Ettredge et al. 2001; Hurtt et al. 2001; Khadaroo 2005; Abdul Hamid 2005; Oyelere and Mohamed, 2007). Another research stream compares web-based disclosure across countries (Deller et al. 1999; Allam and Andrew 2003). The third category of research is explicative and examines the determinants of such practices (Ashbaugh et al.1999; Pirchegger and Wagenhofer 1999; Marston 2003; Oyelere et al. 2003; Marston and Annika 2004; Xiao et al. 2004; Bonson and Thomas 2006; Sriram and Laksmana 2006; Abdelsalam et al. 2007; Gutierrez-Nieto et al. 2008).

The overall corporate internet reporting practices of listed companies in Bangladesh were investigated by Bhuiyan et al. (2007), Dutta and Bose (2007) and Nurunnabi and Monirul (2012). According to Bhuiyan et al. (2007) only 40.24% listed companies have websites among which 33.33% companies provide information on the web. Dutta and Bose (2007) also found that only 38.81% of the listed companies had a website and 61.54% reported at least one financial item on the web site. Their findings revealed that the banking, leasing and finance sector are more advanced than other sectors in establishing a website for corporate reporting. Moreover, more than 71%of companies reported at least one corporate governance item on their websites and only around 38% companies provided social information on their websites but this study did not examine any determinants or factors influencing the disclosure of information on the web.

Khan et al. (2009) investigated the emerging issues of online corporate financial reporting in the global context and then made an attempt to provide an appraisal of the current practice of corporate financial reporting on the internet (FRI) by Bangladeshi companies. They selected the top 30 companies on the Chittagong Stock Exchange as their sample and found that only 75% of the companies having website disclose financial statements on the internet. They also analysed the issues relating to financial reporting on the internet in Bangladesh through focus group discussions with different stakeholders and the responses to a structured questionnaire. Again Dutta and Bose (2008) investigated the utilisation of corporate websites for communicating corporate environmental information by the listed companies of Bangladesh. The sample for the study consists of 104 listed companies among which only 17 companies (16.35%) disclosed environmental information on their websites: out of these 17 companies, 3 (17.65%) companies belong to the pharmaceutical and chemical sector and 2 (11.76 %) companies from each of the four sectors such as papers and printing, cement, engineering and electrical, and textile and clothing sectors, disclose environmental information on their websites. Like their previous studies, they did not examine any factors or determinants influencing the disclosure.

The extent of utilization of corporate annual reports and corporate websites for communicating corporate environmental information by the listed companies of Bangladesh was examined by Banerjee and Probal (2009). By analysing corporate annual reports of 30 companies and corporate websites of 17 companies in Bangladesh, they found that corporate environmental reporting in Bangladesh is still in its infancy, no matter which medium of communication is used. They also found that there is no statistically significant difference exists between these two media of communication in the case of disclosing environmental information.

Sobhani et al. (2012) examined the status of corporate sustainability disclosure practices in the annual reports and corporate websites of the banking industry in Bangladesh. Their analysis revealed that most of the disclosed sentences are related to social issues whereas environmental issues are generally ignored. With respect to sustainability disclosure practices in the annual reports, 73.17% of sentences are found to be related to social issues and only 1.12% of sentences are related to environmental issues while with respect to website disclosure, 99.07% of sentences are related to social issues whereas only 0.27% of sentences are related to environmental issues. Moreover, in case of economic disclosure, annual reports disclose more economic information than websites, which are 25.71% and 0.66%, respectively. The study considered only the banking sector and results may be different for the other sectors in Bangladesh.

Only Nurunnabi and Monirul (2012) examined the current state of voluntary disclosure of internet financial reporting (IFR) in Bangladesh as an example of an emerging economy. They investigated empirically some company characteristics as determinants of such practice. They found that only 29.12% companies had web sites out of the 285 listed companies and only 33.34% companies' provided financial information. Moreover the study examined the association between a number of company characteristics and the extent of voluntary disclosure of IFR: they found that only big four audit firms and non-family ownership variables were significantly associated with the levels of voluntary disclosure.

This review supports the assertion that previous studies on internet reporting in

Bangladesh have examined either a particular aspect of corporate reporting: such as corporate environmental reporting, Dutta and Bose 2008; Banerjee and Probal 2009; Sobhani et al. 2012, or how the internet is used for corporate reporting: Bhuiyan et al. 2007; Dutta and Bose 2007; Khan et al. 2009; Nurunnabi and Monirul 2012). There is only one study (Nurunnabi and Monirul 2012) which considers the determinants of corporate internet reporting in Bangladesh but they didn't consider how much voluntary information are disclosed on the internet in Bangladesh. Although the study of Nurunnabi and Monirul was published in 2012 they used the data from 2009.There are some studies regarding the extent of voluntary disclosure in the printed annual report (Das et al. 2015) but there is no single study which considers the extent of total voluntary information on the internet.

In order to remove this gap, the current study not only considers the extent of voluntary information on the internet but also tries to identify the determinants of such disclosure. Moreover, this study will focus the voluntary disclosure and their different categories, which will help to identify the less focused area of voluntary disclosure in Bangladesh. This study covers all the non-financial listed companies in Bangladesh and performs sector wise analysis of disclosure levels which will provide a total picture of internet disclosure to the interested parties.

5. Methodology

5.1 Sample size

The sample initially included all the listed non-financial companies on the Dhaka Stock Exchange (DSE) at 31 March, 2014 which was 159. Out of these 159 companies only 141 companies (88.68 percent) were found to have corporate websites. An overview of sector wise sample size is shown in Table 1.

Sector	Population	Sample	Percentage
Cement	7	7	100%
Ceramics	5	5	100%
Engineering	25	25	100%
Food and Allied	18	15	83.33%
Fuel and Power	15	14	93.33%
IT sector	6	6	100%
Jute	3	1	33.33%
Miscellaneous	9	7	77.78%
Paper and printing	1	1	100%
Pharmaceuticals and Chemical	25	21	84%
Services and Real Estate	3	3	100%
Tannery Industries	5	3	60%
Telecommunication	2	2	100%
Textile	32	28	87.50%
Travel and Leisure	3	3	100%
Total	**159**	**141**	**88.68%**

5.2 Index construction

The study aims to measures the extent of total voluntary disclosure and its categories in the corporate internet reporting based on a self constructed checklist which consists of 128 items.The presence of the item in the corporate websites is represented by (1), while the absence of the item is represented by (0). The checklist is composed of different sections showing the whole voluntary disclosure categories. The disclosure level is measured using the percentage of the present items over the whole disclosure index items. This approach has been employed in several prior studies e.g., Nurunnabi and Monirul (2012), Dutta and Bose (2008), Rouf (2011), Wallace (1987), Cooke (1991, 1992), Karim (1995), Hossain et al.(1994), Ahmed and Nicholls (1994), and Hossain (2000). This can be presented mathematically as follows:

$$UIx = [\sum T tx] / nx$$

Where, UIx is the unweighted index scored by company, x, 0 = Ix =1; Ttx 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, Corporate Social reporting, Environmental reporting and Sustainability reporting, Investor Related Information and Information Presentation Format on the internet.

Table 2: Distribution of the index items into different parts

	Major Parts of Report	Total	Percentage
Voluntary Disclosure	General Corporate Information	10	7.81
	Corporate Strategic Information	7	5.47
	Corporate Governance/ Directors Information	14	10.94
	Financial Information	17	13.28
	Corporate Social Responsibility reporting	14	10.94
	Corporate Environmental Information	13	10.16
	Sustainability Information	25	19.53
	Investor Related Information	13	10.16
	Presentation Format	15	11.72
	Total	128	100%

5.3 Variable measurements:

Variable measurement techniques and their expected sign are given in table 3:

Table 3: Explanatory variables and their expected sign

Determinants	Variables	Variable Level	Expected sign
Firm size	Natural log of total asset	LDASST	+
Profitability	Return on Equity	ROE	+
Audit firm's international link	Audit firms link with Big Four Firm	AUDITOR	+
Leverage	Debt to equity ratio	LEV	+
Multinational parents	Subsidiary of a multinational company	MNC	+
Liquidity	Current ratio	CURRENT	+
Market Category	Market category of DSE, 1 for Z, 0 otherwise.	MKTCATE	-

Independent director in the board	Number of independent director on the board	IND	+
Dual leadership structure	Dummy variable 1 for CEO duality or role duality, otherwise 0.	RODUAL	+
Board size	Number of Board member	BOSIZE	+
Ownership structure	Sponsor hold 50% or more ownership	SPONSOR	-
Company Age	Company's listed year	LISYR	+

The following multiple linear regression models are used to investigate the association between the determinants and voluntary disclosure requirements in Bangladesh:

ICRIV $=\beta_0 + \beta 1$ LDASST $+ \beta 2$ ROE $+\beta 3$ AUDITOR $+ \beta 4$**LEV** $+ \beta 5$MNC$+ \beta 6$CURRENT $+ \beta 7$ MKTCATE $+ \beta 8$ IND $+ \beta 9$ RODUAL $+ \beta 10$BOSIZE $+ \beta 11$SPONSOR $+ \beta 12$ LISYR $+ \epsilon$

Where,

ICRIV = Internet Corporate Reporting Index for Voluntary

β_0=Constant

$\beta_{1-}\ \beta_{12}$=Explanatory variables

ϵ = Error term

6. Findings and analysis

To measure the level of voluntary disclosure on the internet by the listed companies in Bangladesh, a checklist of 128 items was constructed and divided into nine groups. Table 4 showed the descriptive statistics for the level of total voluntary disclosure and the level of disclosing each category of information using the non-financial sample for the year 2013. The results indicate that the mean total voluntary disclosure is about 29.50% which varies between 6.93% to 66.10% for the least and highest non financial companies of Bangladesh respectively.

Table 4: Descriptive Statistics of Voluntary Disclosure

Voluntary Disclosure	N	Mean	Median	Std. Deviation	Mini-Mum	Maxi-Mum
General Corporate Information	141	0.6610	0.7	0.2154	0	1
Corporate Strategic Information	141	0.2482	0.1429	0.2772	0	1
Corporate Governance	141	0.4564	0.5	0.3413	0	0.9286
Financial Information	141	0.4189	0.4706	0.2706	0	1
Social Responsibility Information	141	0.1175	0	0.2225	0	1
Corporate Environmental	141	0.0693	0	0.2009	0	0.9231
Sustainability Information	141	0.1155	0.08	0.1226	0	0.76
Investor Related Information	141	0.3863	0.3846	0.2049	0	0.8462
Presentation Format	141	0.3631	0.3333	0.1737	0	0.8667
Total Voluntary Disclosure	141	0.2950	0.3047	0.1713	0	0.8594

It is also identified that the disclosure of general information on the website is the highest disclosing category with the value of 66.10% and the lowest disclosing category is corporate environmental information which discloses only 6.93%. Moreover, the interesting thing is that the minimum disclosure for all categories of voluntary disclosure is 0%, which means that at least one of the examined companies missed general information, corporate strategic information, corporate governance information, financial information, corporate social responsibility disclosure (CSR), corporate environmental disclosure, sustainability information, investor related information and presentation format in their website. But the maximum disclosure of all categories is 100% presented by general information, corporate strategic information, financial information and corporate social responsibility disclosure.

6.1 Sector wise disclosure performance

In order to gain a detailed understanding of corporate internet reporting practices, it is necessary to discuss sector wise performance of the listed companies in Bangladesh. It will help to identify the highest and lowest disclosing sector. From the table 5 it can be observed that, telecommunication sector discloses the highest amount of voluntary information on the internet which is 55.47%followed by the Pharmaceuticals and Chemical sector which discloses37.87%. The tannery sector discloses the lowest amount of voluntary information (22.40%). So it can be concluded that Tannery sector of Bangladesh discloses the lowest amount of voluntary information on the internet

Table 5 Sector wise disclosure level

Sector	Voluntary
Cement	34.15%
Ceramics	27.50%
Engineering	25.72%
Food and Allied	26.72%
Fuel and Power	35.10%
IT sector	25.00%
Miscellaneous, Jute and paper	23.09%
Pharmaceuticals and Chemical	37.87%
Services and Real Estate	34.38%
Tannery Industries	22.40%
Telecommunication	55.47%
Textile	25.33%
Travel and Leisure	34.64%

6.2 Correlation of independent variables for voluntary disclosure

To start the analysis, this section examines the association between the extent of total voluntary disclosure as the dependent variable and each of the independent variables for non-financial companies in Bangladesh. As the data set is non parametric, the Spearman's rank correlation is used first to test the association between the variables. After that the study uses Pearson correlation coefficient.

Table 6 Correlation between voluntary disclosure and independent variables

Variables	Spearman	Pearson
Firm size	.478**	.324**
ROE	.315**	.107
Audit firm	.370**	.405**
Multinational parent	.018	-.068
Leverage	.307**	.391**
Current ratio	.123	.047
Market category	-.339**	-.324**
Independent director	.437**	.419**
Board size	.163	.188*
Dual leadership structure	.441**	.410**
Ownership structure	.224**	.259**
Listed year	-.201*	-.139

From the table 6 it can be observed that both Spearman rank correlation coefficient and Pearson correlation coefficient found eight explanatory variables that are significantly associated with the level of disclosing voluntary information on the internet. While firm size, profitability, audit firm's international link, leverage, independent director in the board, dual leadership structure and ownership structure are all positively and significantly associated with the level of voluntary disclosure, market category is significantly negatively associated with the disclosure level. This suggest that large companies with high profitability, companies which are audited by one of the Big four audit firms and who have independent director in the board, dual leadership structure in the board and firms which have more than 50% ownerships in a particular group, are willing to disclose more voluntary information on their website.

It is also notable that multinational firms, company's liquidity and company age have a non-significant association with voluntary disclosure level. Moreover, according to the Spearman test, firm's profitability is significantly positively associated with the level of disclosing voluntary information on the internet. However, the Pearson test found a non-significant association between them. Similarly, while the Spearman test found company age, has a significant negative association with the disclosure level, it had a non-significant association in Pearson test. The Pearson test found a significant positive association between board size and the level of disclosure, whereas Spearman found a non-significant association between them.

6.3 Categorical independent variables for voluntary disclosure

The correlation between the different categories of voluntary disclosure and the determinants of disclosure is shown in the table 7 and table 8 for non-financial companies by using the Spearman Rank correlation and the Pearson correlation coefficient respectively. Under both methods, audit firm's international link, and leverage have significant positive association with different categories of voluntary disclosure, while multinational companies have non-significant association with different categories of voluntary disclosure on the website.

From the Table 7 it can also be observed that under the Spearman test, firm size, profitability, independent director in the board, dual leadership structure have significant positive association with all the different categories of voluntary disclosure. Companies' liquidity has significant positive association with the disclosure of investor related information on the internet. Market category has significant negative association with all the categories of voluntary disclosure except environmental disclosure, while board size has only significant positive association with corporate social responsibility disclosure (CSR). Again company ownership structure has significant positive association with all the categories of voluntary disclosure except environmental disclosure, sustainability disclosure and presentation format. On the other hand company age has significant negative association with all the categories except financial information disclosure, environmental disclosure and presentation format of voluntary disclosure.

Table 7 Spearman correlation for dependent and independent variables

	Voluntary	General	Strategic	Governance	Financial	CSR	Environm.	Sustainabi.	Investor	Presentation	Firm_size	ROE	Audit-firm	Multination	Leverage	Current	Market cate	Ind_direct	Board-size	Dual structure	Ownership	Listedyr
Voluntary	1.000																					
General	.866**	1.000																				
Strategic	.855**	.823**	1.000																			
Governance	.879**	.766**	.740**	1.000																		
Financial	.905**	.766**	.760**	.826**	1.000																	
CSR	.668**	.529**	.546**	.485**	.510**	1.000																
Environmental	.542**	.370**	.379**	.359**	.398**	.640**	1.000															
Sustainability	.838**	.607**	.698**	.692**	.735**	.648**	.556**	1.000														
Investor	.816**	.684**	.676**	.633**	.694**	.480**	.384**	.630**	1.000													
Presentation	.738**	.630**	.551**	.551**	.601**	.491**	.357**	.561**	.706**	1.000												
Firm_size	.478**	.416**	.390**	.365**	.401**	.520**	.343**	.358**	.384**	.452**	1.000											
ROE	.315**	.254**	.200*	.271**	.256**	.310**	.196*	.289**	.319**	.247**	.203*	1.000										
Auditfirm	.370**	.265**	.285**	.395**	.403**	.338**	.177*	.304**	.265**	.242**	.282**	.324**	1.000									
Multinational	.018	-.029	.058	.025	.082	-.011	-.122	-.030	.048	-.061	.110	-.037	.073	1.000								
Leverage	.307**	.215*	.260**	.292**	.240**	.266**	.291**	.280**	.244**	.214*	.115	.276**	.151	-.107	1.000							
Currentratio	.123	.075	.156	.080	.155	.093	-.047	.072	.169*	.058	.190*	.008	.093	.755**	-.098	1.000						
Marketcate	-.339**	-.380**	-.323**	-.345**	-.303**	-.192*	-.105	-.202*	-.304**	-.244**	-.293**	-.307**	-.210*	-.248**	-.141	-.239**	1.000					
inddirector	.437**	.422**	.405**	.442**	.406**	.200*	.202*	.222**	.369**	.344**	.271**	.154	.257**	.011	.188*	-.022	-.157	1.000				
Boardsize	.163	.090	.111	.124	.161	.181*	.140	.130	.131	.145	.284**	.142	.350**	.105	.074	.070	-.121	.245**	1.000			
Roleduality	.441**	.435**	.376**	.461**	.391**	.266**	.177*	.369**	.349**	.243**	.099	.160	.177*	.068	.157	.039	-.301**	.238**	.099	1.000		
Ownership	.224**	.240**	.168*	.226**	.169*	.287**	.162	.128	.218**	.105	.201*	.323**	.317**	-.012	.235**	-.005	-.120	.242**	.262**	.239**	1.000	
Listedyr	-.201*	-.174*	-.196*	-.169*	-.119	-.205*	-.148	-.182*	-.192*	-.133	-.333**	-.063	.003	-.061	.147	-.091	.131	-.034	.091	-.064	.039	1.000

Table 8: Pearson correlation for dependent and independent variables

	Voluntary	General	Strategic	Governanc	Financial	CSR	Environm.	Sustainabi.	Investor	Presentatio	Firm_size	ROE	Audit-fir.	Multinati.	Leverage	Current	Mkt-cate	Ind_direct	Board-size	Dual struct	Ownership	Listedyr
Voluntary	1																					
General	.818**	1																				
Strategic	.817**	.700**	1																			
Governance	.853**	.766**	.683**	1																		
Financial	.886**	.763**	.715**	.852**	1																	
CSR	.728**	.438**	.569**	.458**	.467**	1																
Environmental	.600**	.313**	.385**	.294**	.361**	.643**	1															
Sustainability	.836**	.533**	.693**	.583**	.639**	.809**	.644**	1														
Investor	.799**	.670**	.634**	.627**	.685**	.462**	.407**	.561**	1													
Presentation	.730**	.634**	.509**	.534**	.597**	.414**	.385**	.518**	.699**	1												
Firm_size	.324**	.265**	.259**	.248**	.257**	.278**	.137	.275**	.282**	.324**	1											
ROE	.107	.120	.100	.055	.113	.103	.070	.104	.072	.040	.195*	1										
Auditfirm	.405**	.259**	.308**	.367**	.399**	.366**	.194*	.387**	.264**	.234**	.181*	.086	1									
Multinational	-.068	-.040	-.033	-.041	-.013	-.083	-.107	-.073	-.017	-.107	-.011	.038	-.032	1								
Leverage	.391**	.216*	.297**	.295**	.264**	.446**	.406**	.381**	.250**	.235**	.088	.082	.151	-.108	1							
Currentratio	.047	.078	.102	.072	.122	-.032	-.090	-.045	.104	-.018	.103	.063	.031	.564**	-.111	1						
Marketcate	-.324**	-.357**	-.285**	-.346**	-.316**	-.175*	-.059	-.198*	-.293**	-.230**	-.282**	-.233**	-.210*	-.136	-.141	-.143	1					
Inddirector	.419**	.383**	.358**	.451**	.405**	.219**	.158	.210*	.355**	.369**	.187*	.126	.238**	-.091	.163	-.018	-.158	1				
Boardsize	.188*	.071	.122	.130	.157	.258**	.095	.174*	.137	.165	.251**	.128	.369**	-.017	.075	.000	-.122	.241**	1			
Roleduality	.410**	.439**	.330**	.455**	.388**	.225**	.149	.291**	.335**	.216*	.022	.160	.177*	.111	.157	.089	-.301**	.231**	.095	1		
Ownership	.259**	.225**	.197*	.223**	.180*	.327**	.132	.215*	.222**	.114	.170*	-.020	.317**	-.099	.235**	-.016	-.120	.230**	.276**	.239**	1	
Listedyr	-.139	-.175*	-.122	-.167*	-.111	-.048	.015	-.084	-.182*	-.111	-.310**	.019	.005	-.090	.152	-.073	.119	-.035	.052	-.054	.048	1

According to the Pearson correlation coefficient (table 8), firm size, independent directors in the board, company ownership structure and dual leadership structure have significant positive association and market category has significant negative association with all the different categories of voluntary disclosure except environmental disclosure. Companies' profitability and companies liquidity has non-significant association with different categories of disclosure. While a company's board size has a significant positive association with corporate social responsibility reporting and sustainability disclosure. On the other hand company age has a significant negative association with general disclosure, corporate governance disclosure and investor related information disclosure on the web.

6.4 Bivariate analysis

The result of bivariate analysis helps to identify whether the selection of variables is appropriate or not. As it measures the association of how well independent variable relates to the dependent variable, the result is specific. This study applies bivariate analysis to identify the appropriateness of independent variables and found that (table 9), firm size, profitability, audit firm's international link, multinational parent, independent directors in the board, board size, dual leadership structure, and ownership structure have significant positive association and market category and leverage have significant negative association with the level of disclosure on the internet.

Table 9 Bivariate analysis for voluntary disclosure

Total	Coefficient	T
Firm Size	0.0518	1.93**
Firm Profitability	0.0251	2.4**
Audit Firms	0.1873	4.74***
Multi Parent	0.1911	3.96***
Leverage	-0.0025	-2.69***
Liquidity	0.0055	0.74
Mkt Category	-0.1428	-5.28***
Independent	0.0909	6.22***
Board Size	0.0179	2.62**
Dual Leadership	0.1730	7.22***
Ownership	0.0883	3.18***
No Listed Year	-0.0021	-1.58

6.5 Multivariate analysis

The result of bivariate analysis is specific, so to generalise the result of this study multivariate analysis is applied. In this study; linearity, independence and normality of error, homoscedasticity and multicollinearity have been checked to justify the regression. The graphs for checking linearity of each independent indicate that most of the independent variables in the model do not have an obvious linear relationship with the dependent variable. It may be because of the presence of outliers or unusual observations. The P-P plot, Kernal Density estimate and Shapiro-Wilk *W* test for normality also indicates that errors and dependent variables are not normally distributed and this is mainly related to the skewness of the distribution. The current study employs two numerical methods for heteroscedasticity; Breusch-Pagan / Cook-Weisberg and White's test; and Cameron & Trivedi's decomposition of IM test. The results point out that error has non-constant variance (heteroscedastic). However, the results of VIF and correlations coefficients under both Spearman and Pearson confirm that there is no multicollinearity. Therefore, the data analysis needs to be applied using a non-parametric test that fits with this type of non-parametric data which is not normally distributed. The OLS is a parametric test, and to fit with the non-parametric data it needs to be employed using robust standard error. The result of OLS regression with robust standard error for voluntary disclosure model is presented in table 10. From the table it can be observed that the total voluntary disclosure has significant positive association with firm size ($p = 0.10$), audit firm's international link ($p = 0.01$) multinational parent ($p = 0.01$), independent director in the board ($p = 0.01$) and dual leadership structure ($p = 0.01$) while it has significant negative association with firms profitability ($p = 0.01$) and firm leverage ($p = 0.05$). The positive association means that total voluntary disclosure increases with the increase in firm's size, audited by big four audit firm, having multinational parents, high number of independent directors in the board and the existence of dual leadership in the board structure. On the other hand, negative association means that voluntary disclosure on the internet decreases for profitable companies and highly levered firm. In addition, market category, board size, and ownership structure have a negative non-significant association. On the other side, company's liquidity and company age have non-significant positive association with the level of voluntary disclosure on the internet. The value of adjusted R square is 46.5% which means that 46.5% of the changes of total voluntary disclosure are explained by the changes in its examined determinants. Some prior studies have reported stronger as well as weaker explanatory power using different sets of independent variables. For example, Depoers (2000) reported 65%, Barako et al. (2006) reported 53.4% and Iskander (2008) reported 45%, Haniffa and Cooke (2002) reported 47.9%. Referred to the different categories of voluntary disclosure, there is a significant positive association of multinational parent with all categories of voluntary disclosure on the internet except general disclosure. Firm size has significant positive association with strategic information, corporate governance, corporate sustainability, and presentation format. Company's profitability has significant negative association with all the categories of voluntary disclosure except environmental information, investor information and presentation format on the website. Also audit firm's international link has significant positive association with strategic information, corporate governance disclosure, financial disclosure and sustainability disclosure. In the same way, leverage has significant negative associated with strategic information, corporate governance disclosure, financial disclosure, CSR disclosure and sustainability disclosure. Market category is negatively and significantly associated with general and corporate governance disclosure. Independent director in the board has significant positive association with general, strategic, corporate governance, financial, investor and presentation format. Moreover, role duality has significant positive association with general, strategic, corporate governance, financial, sustainability and investor information. Ownership structure has significant positive association only with CSR disclosure. Moreover, board size has non-significant association with all the categories of voluntary disclosure. The result of the regression analysis agree with the research hypotheses concerning the existence of positive significant relationship between the total voluntary disclosure on the internet with firm size , audit firm's international link, multinational parent, independent director in the board and dual leadership structure. On the other hand, the regression result found significant negative association of total voluntary disclosure on the internet with the profitability measured and leverage.

However, the study found non-significant association of liquidity, market category, board size, ownership structure, and company age with the level of disclosing voluntary information on the internet.

Table 10: OLS Regression with robust standard error for voluntary disclosure

	Voluntary		General		Strategy		Governance		Financial	
	Coeff.	T	Coeff.	T	Coeff.	T	Coeff.	T	Coeff.	T
Firm Size	0.026	1.77*	0.027	1.26	0.039	2.1**	0.038	1.76*	0.038	1.42
Return of Equity	-0.076	-2.7***	-0.062	-1.7*	-0.117	-2.94***	-0.155	-2.35***	-0.122	-2.34**
Audit Firm Size	0.088	2.67***	0.051	1.4	0.119	1.76*	0.197	3.12***	0.191	4.34***
Multinational Parents	0.113	3.08***	0.043	1.11	0.137	1.97*	0.148	2.41**	0.095	1.8*
Leverage	-0.008	-2.25**	-0.007	-1.5	-0.013	-2.65***	-0.013	-1.76*	-0.014	-2.17**
Current ratio	0.013	0.69	0.033	1.14	0.028	0.77	0.0001	0	0.012	0.31
Market Category	-0.033	-1.07	-0.090	-1.88*	-0.066	-1.34	-0.108	-1.98**	-0.070	-1.39
Independent Director	0.048	3.94***	0.063	3.79***	0.071	2.82***	0.116	4.13***	0.079	3.22**
Board Size	-0.004	-0.92	-0.013	-1.56	-0.010	-1.1	-0.014	-1.3	-0.010	-1.15
Role Duality	0.100	3.35***	0.159	3.34***	0.131	2.69***	0.271	4.32***	0.165	2.94***
Ownership Structure	-0.0002	-0.01	0.024	0.67	0.011	0.23	-0.0003	-0.01	-0.019	-0.43
No. of Year-listed	-0.002	-1.58	-0.002	-1.28	-0.002	-0.55	-0.001	-0.41	-0.001	-0.34
Constant	-0.066	-0.47	0.318	1.58	-0.231	-1.25	-0.089	-0.4	-0.083	-0.32
R	.723		.631		.580		.707		.644	
R Square	.522		.399		.337		.500		.414	
Adjusted R square	.465		.327		.257		.440		.344	

	CSR		Environmental		Sustainability		Investor		Presentation	
	Coeff.	T	Coeff.	T	Coeff.	T	Coeff.	T	Coeff.	T
Firm Size	0.024	1.2	0.006	0.3	0.014	1.66*	0.019	1.01	0.039	2**
Return of Equity	-0.083	-2.77***	-0.036	-1.37	-0.050	-2.69***	-0.020	-0.49	-0.058	-1.37
Audit Firm Size	0.083	1.33	0.022	0.36	0.062	1.95*	0.036	0.77	0.033	0.87
Multinational Parents	0.196	2.77***	0.188	2.5**	0.083	2.61***	0.079	1.68*	0.069	1.82*
Leverage	-0.010	-2.65***	-0.004	-1.2	-0.006	-2.61***	0.0003	0.07	-0.005	-0.87
Current ratio	0.005	0.15	0.018	0.77	-0.006	-0.41	0.050	1.87*	0.013	0.52
Market Category	0.026	0.74	0.044	0.92	0.011	0.51	-0.051	-1.18	-0.044	-1.02
Independent Director	0.004	0.27	0.017	0.89	0.005	0.55	0.061	3.35***	0.059	3.18***
Board Size	0.007	0.76	-0.001	-0.15	-0.002	-0.58	-0.003	-0.38	0.000	-0.04
Role Duality	0.036	1.36	0.021	0.66	0.039	2.26**	0.098	2.68***	0.041	1.14
Ownership Structure	0.058	2.03**	-0.018	-0.54	-0.006	-0.32	0.008	0.23	-0.037	-1.31
Year-listed	-0.002	-1.15	-0.003	-1.74*	-0.003	-2.58**	-0.003	-1.72*	-0.003	-1.77*
Constant	-0.277	-1.49	-0.089	-0.49	-0.076	-0.96	0.063	0.35	-0.085	-0.47
R	.646		.528		.677		.581		.566	
R Square	.417		.279		.459		.337		.320	
Adjusted R square	.348		.192		.394		.258		.238	

7. Conclusion and recommendation

This paper includes two phases of analysis. First, it examines the extent of voluntary reporting on the internet; finally, scrutinize the factors association with voluntary reporting on the internet. The study revealed that average disclosure rate of non financial companies in Bangladesh is 29.50% with highest disclosure in telecommunication sector (55.47%) and lowest disclosure in tannery sector (22.40%). These results clearly suggest that the listed non financial companies in Bangladesh are not using the full potential of the Internet for communicating corporate voluntary information to stakeholders.

This study identified the determinants of voluntary on the internet through correlation, bivariate and multivariate analysis.The result of the regression analysis found that the total voluntary disclosure has significant positive association with firm size, audit firm's international link, multinational parent, independent director in the board and dual leadership structure whereas significant negative association with the firms profitability and firm leverage. However, board size, ownership structure, company's liquidity and company age have non-significant association with voluntary reporting on the internet.

This study presents a snapshot of internet financial reporting of Bangladeshi companies from December 2013 to March 2014. This study could not examine the longitudinal data of internet reporting, and so is limited to a cross-sectional study. However, this study provides a base for future longitudinal studies of internet reporting in Bangladesh. The explanatory power in the multiple regression analysis is 46.5%; although this percentage is considerable, it might indicate that other variables that were not included in the model affect the level of disclosure. Some variables are excluded in this study because of their unavailability, for example, the qualification of accountants, the attitude of management to IT, audit committee, and the technological infrastructure. Therefore, future studies might usefully employ other variables, which could affect voluntary reporting on the internet and disclosure in Bangladesh.

As corporate social reporting, corporate environmental reporting and sustainability reporting are voluntary in Bangladesh; it helps regulators to assess the necessity of developing a framework and guidelines for disclosing voluntary information on the internet which will reduce the information asymmetry and increase investors' confidence. The result of the study will also provide beneficial insights for legislators, accounting professionals and researchers to assess the current status of corporate internet reporting in Bangladesh and the characteristics of the companies that are, and that are not, satisfying national and international investors' demand for online information. As the findings revealed that most of the companies have a web page, so it can be said that having a corporate web site is a common practice in Bangladesh. Now the regulators like BSEC and ICAB can play an important role in promoting corporate websites as a communication tool for investors which can be considered as a motivating factor for companies.

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