Voluntary assurance of sustainability reporting: Evidence from an emerging economy

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Voluntary assurance of sustainability reporting: Evidence from an emerging economy

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Abstract

Purpose – This paper aims to investigate the supply and demand side of sustainability assurance in Bangladesh.

Design/methodology/approach – Drawing on signalling theory, a logistic regression model is used for a sample of 100 of the largest Bangladeshi companies to study the relationships between assurance, sustainability disclosure, industry membership and reporting format.

Findings – Our results show that companies which produce more sustainability information are more likely to get their sustainability assured, to be from non-carbon intensive industries, and are more likely to integrate their sustainability information with the financial annual reports. Our results support the argument that organisations based in weaker legal environments are more likely to secure assurance as this adds to the credibility and reliability of sustainability reports.

Implications – The findings of this paper will prove valuable to practitioners and researchers. Practitioners, including assurance providers and sustainability reporting managers, will benefit from our study as it covers both the demand and supply side characteristics of assurance. Researchers will benefit from the study as it investigates assurance practices in the developing country of Bangladesh.

Limitations – This paper has limitations which raise some issues for future research. Firstly, we have covered only large companies, therefore future research could examine the differences between small and large companies in relation to assurance. Secondly, our data consists of company sustainability disclosure information in the fiscal year 2015. Longitudinal studies are recommended to extend this research. Finally, future research could examine the moderating effects of geographical location on the relationship between assurance (and its providers) and other variables

Originality/value – This is the first study to examine both the supply and demand sides of sustainability assurance in Bangladesh. We also introduce reporting format when measuring the relationship between assurance and its determinant factors at micro level. The study also links assurance to signalling theory.

Keywords

Assurance; Sustainability disclosure; Signalling theory; Bangladesh; Industry membership; Reporting format.

Paper Type – Research paper

1. Introduction

There has been a growing tendency for companies to have their sustainability reports voluntarily assured to enhance stakeholders' confidence (Simnett *et al*., 2009; KPMG, 2013; Bagnoli and Watts, 2017; Reimsbach *et al*., 2017). The process of assurance may encourage companies to produce and disclose more reliable and accurate sustainability information and strengthen companies' commitment to sustainability (Cohen and Simnett, 2015; Gürtürk and Hahn, 2016; García-Sánchez and Martínez-Ferrero, 2016).

However, the results of prior studies show that many companies do not choose to assure their sustainability activities (KPMG, 2013; Casey and Grenier, 2015; Seguí-Mas *et al*., 2015). This might indicate that the cost of the assurance service is high or that there is a perception that it does not add value to the report (Fernandez-Feijoo *et al*., 2015). In addition, despite the initiatives of numerous professional bodies and standards such as the Global Reporting Initiative (GRI), the Assurance Standard (AA1000AS), and the International Standard on Assurance Engagements (ISAE 3000), no generally accepted approach to assure sustainability information has been established, resulting in a wide variety of formats and approaches (Perego and Kolk, 2012). As a result, previous studies focus on different aspects of assurance: assurance providers (the supply side); companies receiving assurance (the demand side); both supply and demand side; assurance at country level; and assurance at organizational level. Based on the above it can be argued that assurance provision is lacking in specificity, robustness, and transparency.

In this paper we use signalling theory to better understand why some companies assure their sustainability activities and others do not. This theory assumes that the company knows its chosen level of sustainable activities but the stakeholders do not (Mahoney *et al*., 2013;

Bagnoli and Watts, 2017). We create and test a model of the relationships between assurance, sustainability disclosure, industry membership, and reporting format[1].

The study makes several contributions to the extant sustainability literature. First, our paper contributes to research on both the demand and supply sides of assurance. Second, our paper adds reporting format when measuring the relationship between assurance and its determinant factors at a micro level (Mock *et al*., 2013; Kolk and Perego 2010; Zorio *et al*., 2013; Perego 2009; Sierra- García *et al*., 2013). We suggest that the choice of reporting format can be considered as a proactive, strategic communication driven activity rather than a decision that managers passively make in response to external scrutiny (Hassan and Guo, 2017). Third, this study is among the first to explore the above relationship in a developing country. Most sustainability assurance studies so far have been conducted in a Western context, whereas research on sustainability assurance is scant in the context of emerging economies. This research fills the gap by focusing on sustainability assurance practice in Bangladesh, the second largest garment exporter in the world after China. Bangladesh is a developing country with huge social, economic and environmental problems (Ullah and Yakub, 2013) and the Bangladeshi corporate context has the distinctive cultural feature of having a strong hierarchical social structure (Al Bassam *et al*., 2015). Although the Bangladeshi government started taking CSR initiatives in the 1990s, sustainability reporting is still in its early stages (Ullah *et al*., 2014). Therefore, investigating the relationship between assurance and its determinant factors can enhance stakeholder confidence in sustainability and contribute to improvement in the lives of its citizens (Ullah and Rahman, 2015).

The remainder of the paper is organized as follows. Section 2 covers prior literature on assurance. Section 3 outlines the theoretical background and development of hypotheses. Section 4 sets out the paper's research design and outlines the variables used in the current

[1] Reporting format relates to where the companies disclose their sustainability information. They either include it in a separate PDF files (separated) or integrate it with the financial annual reports (integrated)

study. Section 5 presents and discusses the results. Section 6 sets out our conclusions and discusses the implications and limitations of the research

2. Literature Review

2.1 Prior studies of assurance

There is a growing body of research examining sustainability assurance from different perspectives (Farooq and De Villiers, 2017). We classify the prior studies into four main research streams. The first main research stream focuses on the supply side (providers of assurance) and explores the potential role of the accounting profession, strategies adopted by practitioners and the challenges faced. O'Dwyer and Owen (2005) and O'Dwyer *et al*. (2011) explore strategies undertaken by practitioners in developing this new assurance market. Other researchers evaluate sustainability assurance statements against the requirements of standards, or compare assurance providers (accounting vs. non accounting practitioners) (O'Dwyer and Owen, 2005; Simnett *et al.,* 2009; De Beelde and Tuybens, 2015). The second main stream focuses on the demand side of assurance. Within this stream, some studies review the role of assurance in enhancing the credibility of sustainability reports (Cheng *et al*., 2015; Hodge *et al.,* 2009). Other studies compare the quality of assured disclosures against non-assured disclosures (Moroney *et al*., 2012). A further group of studies investigate assurance at country level (Kolk and Perego 2010; Simnett *et al*., 2009; Perego 2009) or at organisational level (Mock *et al*., 2013; Kolk and Perego 2010; Zorio *et al*., 2013; Perego 2009; Sierra- García *et al.,* 2013).

The third main stream of research focuses on both supply and demand sides of assurance. This stream includes studies examining the demand side of assurance at country level by analysing published sustainability assurance statements. Other studies analyse the market based on sustainability assurance providers in terms of type, standards used, and the level of assurance provided (Mock *et al*., 2013; Cheng *et al*., 2015; Sobhan et al., 2018).

The fourth research stream focuses on assurance studies that have been carried out in global markets, developed countries and developing countries. Several studies focus on investigating assurance globally (Kolk and Perego, 2010; Perego and Kolk, 2012; Mock *et al*., 2013; Sethi *et al*., 2015). Other studies are based on developed countries (Hodge *et al*., 2009 in Australia; Moroney *et al*., 2012; Gurturk and Hahn, 2015 in the UK and Germany; Sierra *et al*., 2013 in Spain. Only a few studies cover developing markets (Darus *et al*., 2010 in Malaysia; Ullah *et al*., 2014 in Bangladesh; Ackers and Eccles, 2015 in South Africa; Liao *et al*., 2016 in China). The lack of studies of assurance in developing countries also motivates our study of Bangladesh.

2.2 Prior studies of sustainability in Bangladesh

The concept of sustainability reporting is relatively new in Bangladesh (Ullah and Yakub, 2013). Compared to developing countries, the level of sustainability disclosure made by listed companies in their annual reports in Bangladesh is significantly low (Khan *et al.*, 2009; Belal, 2000). Azim *et al.* (2009 find that only around 16 per cent of Bangladeshi companies made such voluntary disclosures. Imam (2000) reports that the disclosure levels of human resource, community, consumer and environmental information were very inadequate. Khan (2010) observes that overall sustainability reporting by Bangladeshi Private Commercial Bank (PCB) is moderate, but that the variety of sustainability items is impressive. Belal (1999) observes that 90 per cent of the companies studied made some form of environmental disclosure. However, Hossain *et al.* (2006) find that only 8.33 per cent of Bangladeshi companies disclose social and environmental information in their corporate annual report. Imam (2000) finds that only 25 per cent of sample companies in the Dhaka Stock Exchange made community disclosures and 22.5 per cent environmental disclosures between 1996 and 1997. However, organisations in Bangladesh respond to adverse media attention with greater levels of positive social and sustainability disclosure (Islam and Deegan, 2010). This implies that sustainability

reporting from Bangladesh can be influenced by various factors including political, social, historical, legal, cultural and technological factors (Imam, 2000).

3. Theoretical Framework and development of hypotheses

Several theories analyse the association between voluntary sustainability disclosure and sustainability performance (Alshbili *et al.,* 2019; Gerged *et al.,* 2018; Mahoney, 2012; Mahoney *et al*., 2013). These are generally consistent with either a voluntary disclosure perspective to which signalling theory belongs, or theories grounded in a socio-political perspective to which greenwashing[2] belongs (Clarkson *et al*., 2011; Hassan and Guo, 2017). We use signalling theory in an attempt to understand whether Bangladeshi companies assure sustainability information as a substantive signal of concern for society and the environment (Lyon and Maxwell, 2011). It is argued that a company with a proactive sustainability strategy and better performance has an incentive to provide extensive disclosure to signal their positive actions to stakeholders (Clarkson *et al*., 2011). Research also suggests that users place more confidence in assured sustainability reports (Hodge *et al*., 2009). In this vein, Bagnoli and Watts (2017) find that companies with greater incentives to engage in socially responsible and sustainability activities purchase professional assurance of their sustainability reports.

Signalling theory assumes that disclosure is costly, and companies will buy assurance when the benefits outweigh the associated costs. (e.g. Cho *et al.*, 2014; Ackers and Eccles, 2015; Fernandez-Feijoo *et al.*, 2015; Bangoli and Watts, 2017). Signalling theory suggests that while engaging in sustainability assurance can impose costs, some benefits accrue to good corporate citizens (Orlitzky, 2008; Braam and Peters, 2018). Thus, a firm may choose

[2] Greenwashing "involves selective disclosure of positive sustainability actions resulting in misleading and biased reporting" (Mahoney et al., 2013, p. 352). Greenwashing is a practice that is deceptively used to promote the perception that a company's policies or products are environmentally friendly, when arguably they are not (Lewis, 2016).

voluntarily assure sustainability report to project an image that the company is socially aware and environmentally friendly (Bangoli and Watts, 2017).

3.1 *Assurance and Sustainability Disclosure*

According to signalling theory, companies provide sustainability information as a substantive signal of their superior commitment to sustainability to their stakeholders. Hodge *et al*. (2009) note that stakeholders placed more confidence in sustainability reports where the level of assurance provided is reasonably high. Other studies (O'Dwyer and Owen, 2005; Hodge *et al*., 2009; Simnett *et al*., 2009; Kolk and Perego, 2010; Hassan and Ibrahim, 2012; Fernandez-Feijoo *et al*., 2015; Sethi *et al*., 2017) provide various reasons to explain why companies seek voluntary assurance. First, to improve the transparency, credibility, reputation and accountability of corporate disclosure; second, to enhance stakeholder trust and confidence; and third, to address concerns over their sustainability impacts. Therefore, according to signalling theory, companies get their sustainability activities assured to ensure that stakeholders are aware of the appropriateness of the companies' actions taken on sustainability issues (Clarkson *et al*., 2011). We would therefore expect that those Bangladeshi companies that provide disclosure on sustainability information will purchase assurance to signal that the company is a more socially responsible corporate citizen (Bagnoli and Watts, 2017). Bringing together the theoretical perspective from signalling theory and the debate over the use of assurance, in our first hypothesis we explore whether those Bangladeshi companies that provide disclosure on sustainability are likely to purchase assurance.

Hence, our first hypothesis is as follows:

Hypothesis 1: Bangladeshi companies that provide disclosure on sustainability are likely to get their sustainability information assured**.**

3.2 Assurance and industry membership

Prior studies measuring the relationship between assurance and industry membership present no conclusive results (Fernandez-Feijoo *et al*., 2015; Bagnoli and Watts, 2017). The first group of studies finds that the choice to obtain assurance on the sustainability report is positively associated with carbon intensive industries (Mock *et al*., 2013; Simnett *et al*., 2009; Strohm, and Swartz; 2007; Sierra *et al*., 2013; Zorio *et al*., 2013; Cho *et al*., 2014; Fernandez-Feijoo *et al*., 2015; Hassan, 2015; Bagnoli and Watts, 2017). The second group finds no evidence that industry membership affects the decision to obtain voluntary assurance on the sustainability reports (Perego, 2009; De Beelde and Tuybens, 2013; Casey and Grenier; 2015; Seguí-Mas *et al*., 2015; Liao *et al*., 2016). We interpret the inconsistency of prior studies to be due to the absence of a theoretical framework for sustainability assurance and the use of different industry classifications (De Beelde and Tuybens, 2015). Therefore, we are entering the debate with the industry sector studies to find proper a justification for the link between assurance and industry membership using signalling theory, which suggests that companies purchase assurance to ensure that stakeholders are aware of the appropriateness of the companies' actions taken on sustainability issues (Clarkson *et al*., 2011).

Some studies suggest that carbon intensive industries tend to assure sustainability information to enhance stakeholders' influence: (Simnett *et al*., 2009; Kolk and Perego, 2010; Zorio *et al*., 2013), while others suggest that non carbon intensive companies have stronger incentives to disclose more positive sustainability information (Thomson and Cowton, 2004). Numerous studies find a positive relationship between assurance and finance industries (Simnett *et al*., 2009; Sierra *et al*., 2013; Cho *et al*., 2014; Fernandez-Feijoo *et al*., 2015; Bagnoli and Watts, 2017). Signalling theory also suggests that it is less costly for more socially responsible and sustainable companies to buy assurance than those less socially responsible companies (Clarkson *et al*., 2011) as they will incur lower costs when assuring sustainability

information. Therefore, we would expect that companies from non-carbon (low) intensive industries are more likely to buy assurance than those from high/medium carbon intensive industries, hence:

Hypothesis 2: Bangladeshi companies from low carbon intensive companies are likely to get assurance.

3.3 Assurance and Reporting Format

Reporting format relates to where the companies disclose their sustainability information. Earlier studies in this area have largely focused on disclosures made in financial annual reports (e.g. Patten, 2015). Recently, the increased awareness of sustainability disclosure has led to reporting in stand-alone report format as the leading practice (KPMG, 2013). However, it is argued that separation of sustainability disclosure and financial statements does not make sense as sustainability activities do not occur independently and it is better to merge both financial and non-financial information in one combined report (Eccles and Krzus, 2010). Consequently, an increasing number of interested parties (e.g. Eccles and Krzus, 2010; IIRC, 2011) have advocated the publication of a single integrated report[3] combining both financial and non-financial information. Although there is little research on integrated reporting and assurance of sustainability information, Sierra *et al*. (2013) find a positive association. However, the study of Fernandez-Feijoo *et al*. (2015) found no significant and positive association. Supporters of signalling theory (Cho *et al*., 2012; 2014) argue that companies with a proactive sustainability strategy and better performance have an incentive to use disclosure to demonstrate this to stakeholders (Clarkson *et al*., 2011). Signalling theory assumes that it is less costly for a company with stronger performance to engage in assurance than one with weaker performance (Bagnoli and Watts, 2017). Following this argument, it will be less costly for such companies to use the financial auditor of the annual financial report to assure their sustainability

[3] The International Integrated Reporting Committee (IIRC) define integrated reporting as "... a concise communication about how organizations' strategy, governance, performance and prospects lead to creating value over the short, medium and long term" (IIRC, 2011, p. 2)

information as well as the financial information. Indeed, prior assurance studies suggest that accounting firms should carry out the assurance (O'Dwyer and Owen, 2005; O'Dwyer *et al*. 2011). Therefore, we suggest that integrating both financial and non-financial information together will encourage companies to assure their sustainability. Hence our third hypothesis:

Hypothesis 3: Bangladeshi companies that combine sustainability information with the annual financial reports are likely to get assurance.

4. Research Methods

4.1 Sample Selection

To assess whether companies in Bangladesh get their sustainability activities assured, the 500 listed Bangladeshi companies in the Dhaka stock exchange in 2015 are used as the first step for sample selection. The researchers went through all the 500 listed companies individually and 100 companies were selected based on providing some form of disclosure on sustainability. As the internet is an important communication channel for sustainability, the reports are collected using the corporate website of each company (De Beelde and Tuybens, 2015).

4.2 Research variables

Sustainable disclosure index. Initial investigation for this study was based on 144 items from G4 Sustainability Reporting Guidelines. Researchers went through all 144 items from G4 Sustainability Reporting Guidelines to develop the disclosure index. They removed all the items that scored zero in all the selected companies, leaving 15 items pertaining to three categories: (i) Stakeholder engagement; (ii) Economic Performance; and (iii) Environmental Performance (see Table 4 for details). The first category, stakeholder engagement, contains eight items. The second category, economic performance indicators, contains three items. The third category, environmental performance, contains four items.

Following previous studies (Adhikariparajuli *et al*., 2019; Alnabsha *et al*., 2018; Elamer *et al*., 2017, 2018, 2019; Elmagrhi *et al*., 2018; Hassan *et al*., 2013b; Ntim and Soobaroyen, 2013), a dichotomous scoring system is used to collect the disclosure index for each company. A value of one is assigned if a company adopts GRI sustainability reporting guidelines, and a value of zero otherwise. The authors independently reviewed disclosure scores, with any scoring differences discussed and reconciled. Weights are not assigned for disclosure index items, as prior studies show that weighted and un-weighted scoring systems produce similar results (Hodge *et al*., 2009).

Insert Table 1 here

Industry membership. Industry membership classification follows Trucost[4] (2007). Using the average carbon emissions to sales revenue ratio, Trucost classifies all business industries into low, medium, and high carbon intensive industries. Therefore, our second variable titled "High", "Medium", "Low" carbon and classified into 3 categories, High, Medium and Low (HML) carbon intensive industries (see Table 1).

Reporting format. A value of 0 is assigned if a firm did not disclose sustainability information; 1, if a firm disclosed sustainability in a standalone report or/and web; and 2, if a firm disclosed sustainability in financial annual reports (see Table 1).

Control variables. Following previous studies (Simnett *et al*., 2009; Sierra *et al*., 2013; Liao, *et al*., 2016) we include: (i) company size (measured as the total assets); (ii) return on assets (ROA and hereafter; measured as the ratio of operating income

[4] Companies classified as "Low intensity", have emissions of less than 50 tonnes CO2e per US$ million Turnover. Companies classified as "Medium carbon intensity", have emissions of between 50-499 tonnes CO2e per US$ million Turnover. Whilst to companies classified as "High carbon intensity", have emissions of greater than 500 tonnes CO2e per US$ million Turnover (Trucost, 2007).

divided by total assets); and (iii) leverage (measured as the ratio of total debt divided by total assets).

4.3 Model Specification

Following Simnett *et al*. (2009) we use a logistic regression model to investigate the relationship between assurance, sustainability disclosure, industry membership and reporting format as follows.

$$Ass = \beta_0 + \beta_1 SR + \beta_2 HML + \beta_3 RF + \beta_4 CF + \beta_5 SIZE + \beta_6 ROA + \beta_7 Lev + \varepsilon \quad (1)$$

Variables are defined as follows: Assurance (Ass), Sustainability reporting (SR), which include Stakeholders' Engagement (SE), Economic Performance (EC), and Environmental Performance (EN), Industry membership measured by High, Medium, Low carbon (HML), Reporting format (RF), Combined format (CF), Size (SIZE), Return on Assets (ROA), Leverage (Lev).

5. Results and Discussion

5.1 Demographic statistics

Table 2 reports that the 100 companies represent 10 different industries: 43 are carbon intensive (15 from high + 28 from medium) and 57 companies are low carbon intensive. Table 2 shows that 37 companies integrate their sustainability with the annual financial reports and 43 separate their sustainability from the annual financial reports.

Insert Table 2 here

5.2 Descriptive statistics

Table 3 below reports descriptive statistics of all study variables. The variables include the four variables specified in the conceptual model (i.e. assurance, total assets, ROA, leverage, and sustainability disclosure items).

Insert Table 3 here

5.3 Analysis of sustainability disclosure index items

Table 4 provides 15 sustainability disclosure index items pertaining to 3 categories: (i) Stakeholder Engagement (SE); (ii) Economic Performance (EC); (iii) Environmental Performance (EN). The percentage of the companies disclosing individual items ranges from 3 per cent (item SE8) to 30 per cent (item EC3), indicating that the Bangladeshi companies disclose some types of sustainability information more readily than others. A cross-group comparison between Assured and Non-Assured companies shows that Assured companies rank first in the mean score of all items compared to Non-Assured companies. These findings indicate that Assured companies provide higher levels of sustainability disclosure than Non-Assured companies. Chi-square analysis shows a significant difference ($P < 0.05$) between Assured and Non-Assured with regards to 3 items: EC1 ($P = 0.052$), EC3 ($P = 0.043$). There are also significant differences between Assured and Non-assured companies with regards to Stakeholders' engagement ($P = 0.004$), Economic performance ($P=0.002$) and Environmental Performance ($P=0.008$).

Insert Table 4 and 5 here

5.4 Correlation Matrix

Table 5 presents the correlation matrix for the variables used in our regression analysis. The results show a significant positive relationship between the dependent variable (assurance) and reporting format as well as all sustainable disclosure activities. However, the results show a significant negative relationship between assurance and industry membership measured by HML carbon classifications. In terms of the control variables, the results show no relationship between assurance and both leverage and ROA. However, there is a positive significant relationship between assurance and size. There is a high correlation between Reporting Format (RF) and combined reporting (CF) (Coef = 0.865). Thus, to alleviate the multicollinearity problem, we impose the orthogonal constraints to decorrelate Reporting Format (RF) and combined reporting (CF).

Insert Table 6 here

5.5 Multivariate results of demand side of assurance

Table 6 presents the regression results for the relationship between assurance and all research variables.

Assurance and sustainability disclosure. Model 1 of Table 6 shows the results of the regression of assurance and sustainability disclosure index activities. The coefficient of *SR* (*P* = 0.000) is significant in the model and supports the argument that Bangladeshi companies that provide disclosure on sustainability are likely to get their sustainability activities assured. Our results are in consistent with previous studies that companies that purchase assurance provide more disclosure on sustainability or social performance ratings, stronger environmental corporate governance, (Simnett et al., 2009; Kolk and Perego, 2010; Moroney et al., 2012; Cheng *et al*., 2015 Casey and Grenier, 2015). The above results provide support for the first hypothesis**.**

Assurance and industry membership. Model 1 of Table 6 shows that there is a negative significant relationship between assurance and HML carbon intensity (p = 0.044). Our results contrast with prior studies that found the choice to obtain assurance on the sustainability report is positively associated with carbon-intensive industries (Mock *et al*., 2007; Mock *et al*., 2013; Simnett *et al*., 2009; Strohm, and Swartz; 2007; Sierra *et al.*, 2013; Zorio *et al*., 2013; Cho *et al*., 2014; Fernandez-Feijoo *et al.*, 2015; Bagnoli and Watts, 2017). However, as our sample is financially driven, our results are in line with prior studies which find a positive relationship between assurance and finance industries (Simnett *et al*., 2009; Sierra *et al*., 2013; Cho *et al*., 2014; Fernandez-Feijoo *et al*., 2015, Bagnoli and Watts, 2017). Our results support the signalling argument that more socially responsible and sustainable companies will be more likely to buy assurance than those less socially responsible and sustainable companies (Sierra *et al*., 2013). Our results are also in line with prior studies of (Ullah and Rahman, 2015) who observed a satisfactory level of sustainability reporting by all listed commercial banks in Bangladesh. This provides support for the second hypothesis.

Assurance and reporting format. The results show that there is a significant relationship between assurance and reporting format (p = 0.017) and support H3: *Bangladeshi companies that combine* sustainability *information with the annual financial reports are likely to get assurance.* To provide robust analysis, we split the reporting format variable into an additional independent variable (CF), "sustainability *combined with annual financial reports*". The results when including the additional independent variable support the significant relationship between assurance and reporting format. That is, the decision to assure sustainability information by Bangladeshi companies is related to where the companies provide sustainability information. This finding is of importance as it contributes to the literature by adding to the scarce evidence of the relationship between reporting format and assurance. Our results are in line with the previous study of Sierra *et al*. (2013). Including the control variables, the results

show that there is no significant relationship between assurance and ROA and Leverage. Our results in line with prior studies that find a positive significant positive relationship between assurance and size (Simnett *et al*., 2009; Sierra *et al*., 2013; Fernandez-Feijoo *et al*., 2015). The results also show that there is no significant relationship between the type of assurance and size, ROA and leverage as control variables.

5.6 Additional analysis: Type of assurance (supply side) and research variables

We conduct a number of additional robustness tests. First, we investigate the relationship between the type of assurance (supply side) adopted in Bangladeshi companies and research variables, following De Beelde and Tuybens (2015). There are two main types of assurance[5]: internal and external.

The assurance data showed that out of the 100 companies, only 61 had their sustainability activities assured, 21 of those companies had both internal and external assurance and 40 had internal assurance (see Table 2).

Models 5, 6 and 7 present ordered logistic regression results for the relationship between the type of assurance and all research variables. The results show that there is a significant positive relationship between the type of assurance and the following research variables (SR, EC, EN and RF). This could indicate that those companies who are providing disclosure concerning economic performance seek both internal and external assurance. Our results show no significant relationship between type of assurance and industry membership. The results show a significant positive relationship between type of assurance and reporting format (RF). This suggests that Bangladeshi companies that integrate their sustainability activities with financial annual reports are likely to get both internal and external assurance.

[5] Internal assurance is executed generally by an employee or a team of employees knowledgeable about environmental management practices and processes' Darnall, Seol, and Sarkis (2009, p.173). By contrast, 'external assurance is executed by independent outside assessors who provide assurances to the organization and its external stakeholders about the business's environmental management practices' (Darnall *et al*., 2009, p. 173).

This provides support for H_3. The results also show that there is no significant relationship between the type of assurance and ROA and leverage.

Second, to ensure that the results are not driven by the financial services sector, as our sample includes financial and non-financial firms, we reran the analysis using non-financial firms. The results, reported in Models 3 and 7 are to great extent similar to those results reported in Models 1 and 2 with slight sensitivity in the variables' levels of significance. These findings indicate that our results are not driven by the financial services sector alone.

Third, our study adds to the stream of prior studies that focus on measuring the relationship between assurance and firm level variables such as industry membership; company size, profitability, leverage and ROA (Perego, 2009; Simnett *et al*., 2009; Kolk and Perego; Zorio et al., 2013) by investigating the effect of SE, EC and EN. As a result our sustainability index consists of three themes (SE, EC, and EN).Therefore, to ascertain how the three categories are related to assurance, we re-ran equation (1) by replacing SR by its components; SE, EC, and EN. The results in Models 2 and 6 show that SE has stronger impact with respect to assurance compared to EC and EN but SE is not significant with the type of assurance. This result suggests that managers of companies in Bangladesh believe that getting their sustainability assured has a positive effect on SE regardless if this assurance is internal or external. Our results support studies on the role of country of origin in influencing the demand for assurance. That is, organisations based in stakeholder orientated countries (Simnett *et al*., 2009) with weaker legal environments are likely to secure assurance as this adds to the credibility and reliability of sustainability reports (Kolk and Perego, 2010; Perego and Kolk, 2012; Perego, 2009). The results of Model 6 suggest that firms that have better economic (EC) and environmental (EN) performance are eager to seek internal and external assurance. These results are consistent with prior Bangladesh studies (Belal, 1999). The above result support the signalling theory interpretation, that companies with a proactive sustainability strategy and

better performance have an incentive to provide extensive disclosure in order to signal their positive actions to stakeholders and enhance their credibility ((Hodge *et al*., 2009; Lyon and Maxwell, 2011; Clarkson *et al*., 2011).

Fourth, the two-way relationship between a company's disclosure level and assurance is debatable. Specifically, a noticeable positive relationship could suggest either the fact that firms are keen to disclose more if they will be assured, or that assurance bodies (internal or external) can apply political pressure on companies to foster their sustainability disclosure levels. To investigate this assumption, we run the following model to examine whether the assurance s the level of sustainability reporting:

$$SR=\beta_0 + \beta_1 Assur + \beta_3 HML + \beta_4 RF + \beta_5 CF + \beta_6 SIZE + \beta_7 ROA + \beta_8 Lev + \varepsilon \qquad (2)$$

The findings, reported in Models 9 and 10, show that assurance has a significant positive impact on level of sustainability reporting. This is consistent with the two-way relationship between a company's disclosure level and assurance notion. This implies that assurance bodies (internal or external) can apply political pressure to foster their sustainability disclosure levels.

Finally, a potential concern regarding our results so far is sample size. To mitigate this concern, we reran our models using bootstrap technique (100x). The results of Models 4, 8 and 10 are similar to those results of Models 1, 5 and 9 reported in Table 6.

6. Conclusion

The purpose of our research is to provide insights on why Bangladeshi companies choose to assure their sustainability information. To do so, we focus on both the supply and demand sides of assurance. We investigated whether voluntary sustainability assurance is used as a signal of superior sustainability actions.

The signalling theory explanation suggests that companies that produce more sustainability information are more likely to get their sustainability activities assured to ensure that stakeholders are aware of the appropriateness of the companies' actions taken on sustainability issues (Clarkson *et al*., 2011). These companies, in general, are from non-carbon intensive industries and are likely to integrate sustainability information with the financial annual report. We find that Bangladeshi companies that get their sustainability information assured provide more disclosure on some sustainability activities (SE) than companies that do not assure. Our results support studies on the role of country of origin in influencing the demand for assurance. That is, organisations based in stakeholder orientated countries (Simnett *et al*., 2009) with weaker legal environments are more likely to secure assurance to enhance the credibility and reliability of sustainability reports (Kolk and Perego, 2010; Perego and Kolk, 2012; Perego, 2009). Furthermore, our results also show a significant negative relationship between assurance and high carbon intensive industries. This is consistent with prior studies which find a positive relationship between assurance and finance industries (Simnett *et al*., 2009; Sierra *et al*., 2013; Cho *et al*., 2014; Fernandez-Feijoo *et al*., 2015, Bagnoli and Watts, 2017).

The findings of this study are of relevance to political decision makers, standard setters, assurance providers and companies with a view to formulating strategies to improve sustainability practices among organisations in developing countries. Regulation over sustainability assurance will be valuable to enhance accountability towards stakeholders in this growing field.

This paper has limitations which raise some issues for future research. First, we have covered only large companies, therefore future research could examine the differences between small and large companies in relation to assurance. Secondly, our data consists of company sustainability disclosure information in the fiscal year 2015. Longitudinal studies are

recommended to extend this research. Finally, future research could examine the moderating effects of geographical location (Hassan *et al*., 2013a) on the relationship between assurance (and its providers) and other variables.

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Tables

Table 1. Demographic Statistics of Sample Companies

Industry	**Frequency**	**Percent**	**Assurance data**	**Frequency**	**Percent**
Oil & Gas	4	4%	**Assured vs not assured companies**		
Basic Materials	2	2%	Assured	61	61%
Industrials	16	16%	Not-Assured	39	39%
Consumer goods	19	19%	**Total**	**100**	**100%**
Consumer services	2	2%	**Type of assurance**		
Healthcare	11	11%	Internal Assurance	40	40%
Telecommunications	3	3%	Both internal and external assurance	21	21%
Utilities	5	5%	No assurance	39	39%
Financial Services	33	33%	**Total**	**100**	**100%**
Technology	5	5%	**Reporting format (RF)**		
Total	**100**	**100%**	Combined with annual reports	37	37%
Industry Membership			Separated from annual reports (stand-alone pdf)	43	43%
Carbon intensive (high)*	15	15%	No disclosure	20	20%
Carbon intensive (medium)**	28	28%	Total	100	100%
Non- Carbon Intensive (low)***	57	57%			
Total	**100**	**100%**			

Note. *High (examples of high carbon industries: construction and materials, electricity, gas, water and utilities, industrial transportation, mining, travel and leisure; **medium (examples of medium industries include aerospace and defence, chemicals, electronics and electrical equipment, food producers, general industrials, support services, and *** low (examples of low carbon industries: banks, fixed-line telecommunications, food retailers, healthcare equipment, life insurance, media, mobile telecommunications, real estate and software).

Table 2: Summary of definitions and operationalisation of variables

Variables	Definitions and coding
Panel A: Dependent variable	
Assur	Sustainability Reporting assurance: 1, If a firm assured their sustainability reporting, 0 otherwise;
Assprov	Type of assurance: 1, If a firm assured their sustainability reporting internally, 2, If a firm assured their sustainability reporting internally and externally, 0 otherwise
Panel A: Dependent variable	
SR	Total Sustainability Disclosure Score. Where, SR - is the sustainability disclosure elements disclosure score containing 15 items based on 3 main themes, including: (1) Stakeholders' Engagement (SE) containing 8 items, (2) Economic Performance (EC) containing 3 items, (3) Environment (EN) containing 4 items. All 15 items have a score threshold of 0 to 1, resulting in a total potential score of (15X1) 15. Where no disclosure = 0, item disclosed= 1. This un-weighted scoring procedure can result in a total potential score of 15; scaled to a value between 0% and 100%.
HML	Industry membership: 1, If a firm is categorised as low carbon industry, 2, If a firm is categorised as medium carbon industry, 3, If a firm is categorised as high carbon industry.
RF	Reporting Format: 0, If a firm did not disclose, 1, If a firm disclosed sustainability in standalone report or/and web, 2, If a firm disclosed sustainability combined in financial annual reports.
Panel E: Control variables	
SIZE	Firm size measured by total assets (in millions).
IR	Integrated reporting: 1, If a firm disclosed sustainability in annual reports, 0 otherwise.
ROA	Profitability, which is measured by net profit to total assets.
Lev	Leverage, which is percentage of total debt to equity
ID	Dummies for each of the industries.

Table 3: Descriptive Statistics of Study Variables

Variables	***N***	***Mean***	***Std. dev.***	***Min***	***Max***
Assurance (Assur)	100	0.61	0.490	0.00	1
Sustainability Disclosure (SR)	100	14.53	0.218	0.00	100
Stakeholder Engagement (SE)	100	10.75	0.256	0.00	100
Economic Performance (EC)	100	27.33	0.343	0.00	100
Environment (EN)	100	12.50	26.48	0.00	100
Total assets (SIZE)	100	24500	57000	0.285	282716
ROA	100	26.285	213.419	-0.010	2115.379
Leverage (Lev)	100	37.835	152.183	0.001	929.054

Table 4. Sustainability Disclosure Index

		Per cent age	*Assurance N (61)*			*No-Assurance N (39)*			*Chi-Square*
			mean	*Std..dev*	*Rank*	*mean*	*Std..dev*	*Rank*	
1.Stakeholder engagement (SE)			1.393	2.478	1	0.026	0.160	2	0.004***
SE1	Provide a list of stakeholder groups engaged by the organization.	13%	0.213	0.413	1	0.026	0.160	2	0.577
SE2	Report the basis for identification and selection of stakeholders with whom to engage	11%	0.180	0.388	1	0	0	2	0.222
SE3	Report the organization's approach to stakeholder engagement, including frequency of engagement by type and by stakeholder group, and an indication of whether any of the engagement was undertaken specifically as part of the report preparation process.	11%	0.180	0.388	1	0	0	2	0.222
SE4	Report key topics and concerns that have been raised through stakeholder engagement, and how the organization has responded to those key topics and concerns, including through its reporting. Report the stakeholder groups that raised each of the key topics and concerns**.**	9%	0.148	0.358	1	0	0	2	0.269
SE5	Reporting period (such as fiscal or calendar year) for information provided.	14%	0.230	0.424	1	0	0	2	0.168
SE6	Date of most recent previous report (if any)	13%	0.213	0.413	1	0	0	2	0.184
SE7	Reporting cycle (such as annual, biennial).	11%	0.180	0.388	1	0	0	2	0.222
SE8.	Provide the contact point for questions regarding the report or its contents	3%	0.049	0.218	1	0	0	2	0.523
2. Economic Performance (EC)			1.311	1.041	1	0.051	0.223	2	0.002***
EC1	Report the direct economic value generated and distributed (EVGandD) on an accruals basis including the basic components for the organization's global operations	42%	0.689	0.467	1	0.026	0.160		0.052*
EC2	Report risks and opportunities posed by climate change that have the potential to generate substantive changes in operations, revenue or expenditure	8%	0.131	0.340	1	0	0	2	0.297
EC3	Where the plan's liabilities are met by the organization's general resources, report the estimated value of those liabilities.	30%	0.491	0.504	1	0	0	2	0.043**
3. Environmental Performance (EN)			0.737	1.250	1	0.128	0.469	2	0.008***
EN1	Report total fuel consumption from non-renewable sources in joules or multiples, including fuel types used.	10%	0.164	0.373	1	0.026	0.160		0.769
EN2	Report the amount of reductions in energy consumption achieved as a direct result of conservation and efficiency initiatives, in joules or multiples.	12%	0.197	0.401	1	0.051	0.223	2	0.788
EN3	Report gross direct (Scope 1) GHG emissions in metric tons of CO2 equivalent, independent of any GHG trades, such as purchases, sales, or transfers of offsets or allowances.	10%	0.164	0.373	1	0	0	2	0.244
EN4	Report the total weight of hazardous and non-hazardous waste, by the following disposal methods: Reuse, Recycling, Composting, Recovery, including energy recovery, Incineration (mass burn), Deep well injection, Landfill, On-site storage AND Other (to be specified by the organization)	13%	0.213	0.413	1	0.0513	0.223	2	0.870

Note. Significance levels: *p < .10. *p < .05. **p < .01. ***p < .001.*

Table 5. Correlation Matrix of Variables for Bangladeshi Companies in Sample

	Assur	SR	SE	EC	EN	HML	IF	RF	ROA	Lev	SIZE
Assur	1.000										
SR	0.486***	1.000									
SE	0.328***	0.899***	1.000								
EC	0.601***	0.734***	0.511***	1.000							
EN	0.282***	0.637***	0.345***	0.306***	1.000						
HML	-0.372***	-0.206**	-0.146	-0.259***	-0.103	1.000					
IF	0.358***	0.174*	0.063	0.398***	0.030	-0.210**	1.000				
RF	0.547***	0.276***	0.156	0.439***	0.123	-0.348***	0.865***	1.000			
ROA	0.051	-0.051	-0.052	-0.001	-0.058	-0.055	0.137	0.121	1.000		
Lev	0.045	0.116	0.075	0.099	0.115	-0.039	0.101	0.071	0.412***	1.000	
SIZE	0.509***	0.484***	0.495***	0.275***	0.660***	-0.344***	0.197**	0.203**	-0.053	-0.106	1.000

Note. The bottom left half of the table contains Pearson's parametric correlation coefficients, whereas the upper right half of the table shows Spearman's non-parametric correlation coefficients. Significance levels: $p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$. Variables are defined as follows: Assurance (Assur), Sustainability reporting (SR), Stakeholders' engagement (SE), Economic Performance (EC), Environment (EN), Industry type measured by [High, Medium, and Low carbon (HML)], Reporting Format (RF), Integrating format (IF), Firm size (SIZE), Return on assets (ROA), and Leverage (Lev). Table 2 fully defines all the variables used.

Table 6. Relationship between Assurance, Type of Assurance and Research Variables

Variables	Dependent variable: Assurance				Dependent variable: type of assurance				Dependent variable: Sustainability reporting	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
	Panel A: Independent Variables									
SR	1.493***		1.391***	1.493	0.410***		0.941***	0.410**		
	(0.00)		(0.00)	(0.98)	(0.00)		(0.00)	(0.02)		
SE		1.232				0.139				
		(0.24)				(0.28)				
EC		3.325***				1.047***				
		(0.00)				(0.00)				
EN		0.612				0.706**				
		(0.19)				(0.01)				
Assur									3.014***	3.014***
									(0.000)	(0.000)
HML	-1.106**	-1.220**	-1.044	-1.106	-0.401	-0.277	-0.039	-0.401	-0.087	-0.087
	(0.04)	(0.04)	(0.13)	(0.24)	(0.26)	(0.44)	(0.93)	(0.41)	(0.841)	(0.800)
RF	1.205**	1.389*	1.233**	1.205	1.268***	1.224***	1.212**	1.268	0.244	0.244
	(0.01)	(0.05)	(0.02)	(0.99)	(0.00)	(0.00)	(0.01)	(0.67)	(0.793)	(0.500)
	Panel B: Control Variables									
CF	-0.694*	-1.188*	-0.771*	-0.694	-0.508	-0.650**	-0.829**	-0.508	-0.524	-0.524
	(0.08)	(0.06)	(0.09)	(0.99)	(0.10)	(0.05)	(0.03)	(0.82)	(0.677)	(0.565)
SIZE	5.239***	1.910*	3.130***	1.695***	2.206***	5.153***	7.087***	3.450***	1.255***	1.255***
	(0.000)	(0.050)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.002	0.002	-1.129	0.002	0.001	0.001	-0.483	0.001	-0.002	-0.002
	(0.56)	(0.71)	(0.45)	(1.00)	(0.58)	(0.45)	(0.68)	(1.00)	(0.183)	(0.945)
Lev	-0.004	-0.004	-0.002	-0.004	-0.002	-0.003*	-0.011**	-0.002	0.003	0.003
	(0.44)	(0.58)	(0.98)	(0.99)	(0.15)	(0.08)	(0.03)	(0.93)	(0.101)	(0.391)
Intercept	0.699	0.416	-0.372	0.699	2.669***	3.497***	4.360***	2.669	0.112	0.112
	(0.42)	(0.67)	(0.76)	(0.99)	(0.00)	(0.00)	(0.00)	(0.22)	(0.922)	(0.887)
chi2	72.52***	80.08***	49.01***	---	71.81***	79.66***	55.37***	---	4.75***	
Pseudo R2	0.5462	0.6032	0.5371	0.5462	0.3434	0.3809	0.4306	0.3434	0.2676	0.2676
No. of obs.	100	100	67	10000	100	100	67	10000	100	100

Notes: This table reports the coefficients and P-value (in parentheses) from using Logistic regression. Variables are defined as follows: Variables are defined as follows: Assurance (*Ass*), Sustainability reporting (*SR*), Stakeholders' engagement (*SE*), Economic Performance (*EC*), Environmental Performance (*EN*), Industry type measured by [High, Medium, and Low carbon (*HML*)], Reporting Format (*RF*), Combined format (*CF*), Firm size (*SIZE*), Return on assets (*ROA*), and Leverage (*Lev*). Table 2 fully defines all the variables used.