DOI: 10.1002/tie.22031

WILEY

RESEARCH ARTICLE

Underpinning the benefits of green banking: A comparative study between Islamic and conventional banks in Bangladesh

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This study aims to compare environmental motives and performance of conventional and Islamic banks in Bangladesh. Green compliance index was developed based on the Bangladesh Bank (the central bank of Bangladesh) guidelines whereas information regarding governance variables is collected from the annual reports of 9 Islamic and 31 conventional banks. Results show Islamic banks are more environmentally friendly compared to their conventional counterparts. Board size is negatively related to green compliance whereas board independence and auditor's type do not have any significant influence on green compliance for both clusters of banks. Compliance with green banking policies enhances the reputation for Islamic banks and accountability and profitability for conventional banks. Results of this study provide useful information for regulatory authorities to formulate policies that are conducive to enhance bank's environmental performance.

KEYWORDS

carbon emission, corporate social responsibility, environmental performance, governance, green banking

1 | INTRODUCTION

The world at large is experiencing devastating effects of the global climate crisis including droughts, floods, tsunami, water scarcity, rising sea level, and the resulting demographic shifts. These consequences of climate change threaten the sustainable living on this planet, which calls for an urgent and collective response from both developed and developing countries. Sir Nicholas Stern has already warned greenhouse gas (GHG) emissions can be reduced to a stable level by spending merely 1 % of the global gross domestic product (GDP) if actions are taken immediately; however, maintaining the same level would require around 5–20% of the global GDP if mitigating strategies are not articulated and adopted soon (Stern, 2007). This entails an effective response toward climate crisis is an urgent issue that requires concerted efforts from all segments of the economy.

Financial institutions, particularly banks, can accelerate the movement of a clean world to a large extent. For instance, these institutions can implement a "go-green" policy for themselves and encourage client firms to adopt clean technology. In the long term, this strategy is expected to be favorable for firms, to reduce the cost and induce the access to the new market. As per their interest, banks should follow the carbon footprint of their clients or projects to ensure overall sustainability. Nieto (2017) estimates loan exposure to higher environmental risk sectors in the United States, European Union, China, Japan, and Switzerland amounts to US$1.6 trillion. Any unfavorable changes in these sectors may result in financial shocks. This urges banks to carefully consider clients' or projects' risk stemming from climate change and regularly disclose carbon footprint resulting from their own operations.

Banks' environmental performance varies as they do not have proper knowledge about the benefits they might receive through implementing green finance. Thus, it is essential to unfold the underlying benefits of green banking for the greater interest of the planet. A good volume of studies has explained the environmental performance of banks and its determinants. However, most of these studies include environmental disclosure to corporate social responsibility (CSR). Moreover, these studies mainly focus on developed economies (see e.g., Branco & Rodrigues, 2008; Douglas, Doris, & Johnson, 2004; El-Bannany, 2007; Jizi, Salama, Dixon, & Stratling, 2014; Menassa & Brodhäcker, 2017; Nobanee & Ellili, 2016; Thompson & Cowton, 2004; Weber, 2012) whereas the academia and policymakers should render more attention toward environmental issues of developing

countries due to some sensible reasons. Firstly, industrialized nations are mostly responsible for the current carbon load but cost-effective ways of abatement and mitigation lie largely in the developing countries (Clark, 2015). Secondly, developing economies are highly vulnerable to adverse consequences of climate change. Among the 10 most affected countries, nine are developing of which Bangladesh is one (Kreft, Eckstein, & Melchior, 2017).

The vulnerability of Bangladesh to climate change is pronounced well in the literature. Rahman and Lateh (2017) show the average temperature of the country rises by 0.2°C per decade. Rising temperature is found to be negatively associated with harvesting of Boro rice (Sarker, Alam, & Gow, 2012). It is also anticipated by the World Bank that a rise of the sea level by 1 m is expected to affect 13 million people in Bangladesh. Therefore, scientific inquiry of Bangladesh climate issues has significant importance. Some studies have already tackled different aspects of climate change including an environmental performance as part of CSR activities of listed firms in Bangladesh (Belal, 2001; Imam, 2000; Muttakin & Khan, 2014; Sobhani, Amran, & Zainuddin, 2009). Similarly, some scholars consider the ways in which banking products can be designed to meet the environmental requirement (Lalon, 2015; Millat, Chowdhury, & Singha, 2012; Rahman, Ahsan, Hossain, & Hoq, 2013; Ullah, 2013). Few studies also investigate the influence of green banking practices on stakeholders (Millat et al., 2012; Saha, 2013).

However, studies that focus extensively on the benefits and drivers of firms' environmental performance are relatively scarce. The current research, therefore, is an attempt to fill this gap. It examines the green compliance and its determinants for Islamic and conventional banks in a comparative manner. Islamic banks under *Shari'ah* principles must follow '*Maqasid Al-Shari'ah* that entails they must comply not only with the *Shari'ah* law but also with the guidance of *Mukallaf* (religiously responsible or accountable behavior). They should reflect the spirit of *Shari'ah* on their performance by striving to be environmentally accountable. Also, Islamic banks have already captured a significant market share in Bangladesh. Therefore, a comparative analysis will shed an important light on the environmental performance of these two clusters of banks and benefits they might derive by implementing the green banking strategy. Another salient contribution of this study is that it includes governance structures as antecedents of banks' green compliance. Governance of banks is believed to play a critical role in framing effective corporate environmental policies.

To achieve these objectives, this article is structured as follows: Section 2 describes relevant literature based on which hypotheses have been developed. Section 3 enumerates data descriptions and methodology. Section 4 analyses the results and findings. Section 5 concludes offering some policy prescriptions and direction for future research.

2 | LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Environmental performance of banks is still in its infancy. In most instances, it is considered merely as an element of CSR. El-Bannany (2007) summarizes studies examining CSR activities of firms in the 1980s and 1990s and found firms put the least emphasis on environmental aspects among all the elements of CSR. Nobanee and Ellili (2016) investigate the level of environmental disclosure of UAE banks and found that the level of disclosure regarding the natural environment is only 3 %. Similarly, Menassa and Brodhäcker (2017) examine the level of environmental disclosure of 169 German banks. Their analysis shows 45% of the sample banks disclose information related to the environment. In the context of Irish bank, Douglas et al. (2004) analyze social responsibility disclosures in annual reports from 1998 to 2001 and found none of these banks disclosed environmental policy in the annual reports.

Some studies also focus on the determinants that motivate banks to be environmentally friendly. For instance, Thompson and Cowton (2004) found most UK banks incorporate environmental considerations in their formal corporate-lending policies to mitigate environmental liabilities, manage environmental risk, and comply with legislation. Similarly, risk-avoidance purpose motivates environmental awareness among Canadian commercial banks (Weber, 2012). Branco and Rodrigues (2008) report Portuguese banks that are listed on stock exchanges and signatories of global-reporting initiatives are more environmentally friendly than other banks. These findings support the idea of environmental information disclosure and higher visibility. In addition, Hamid (2004) studies Malaysian banking and finance companies and found size, listing status, and age of business are positively associated with social responsibility disclosure, which supports the legitimacy theory of firms. Whereas, Indian banks adopt green initiatives to maintain a win-win position. It means these banks implement environmental policies that are also helpful to reduce their cost and improve efficiency (Yadav & Pathak, 2013). Similarly, Chinese banks also show positive commitment toward inventing products that are environmentally friendly (Aizawa, 2010; Zhang, Yang, & Bi, 2011).

In the case of Bangladesh, the literature mainly focuses on sustainable banking activities (Belal, 2001; Imam, 2000; Sobhani et al., 2009). Some researchers have examined the influence of green banking practices on stakeholders (Millat et al., 2012; Saha, 2013). However, studies examining antecedents of banks' environmental performance are very few. Ali and Mahbubur Rahman (2015) examined randomly selected five conventional and Islamic banks in Bangladesh and found their efforts are similar. The study suffered from validity crisis due to a small sample size. Also, Miah, Rahman, and Haque (2018) examine the factors affecting the environmental performance of conventional banks in Bangladesh and found banks' credit rating is positively related to their environmental performance. Similarly, Masukujjaman, Siwar, Mahmud, and Alam (2016) interviewed individuals of seven Islamic banks and found Islamic banks are more compatible with green banking requirements. Besides the small sample size, these studies do not offer a comparative scenario that is crucial given the importance of Islamic and conventional banks for the financial system in Bangladesh.

In addition, past studies have ignored the governance structure of firms as a driver of a firm's environmental performance. Jizi et al. (2014) examine the disclosure of U.S. banks and found a positive association between board characteristics (independent directors and board size) and bank's environmental performance. However, implementation of green banking holds the principle of sustainable development (Dialysa, 2015), which may derive through two core reinforcements - corporate governance compliance and firm-specific

needs. Researchers present evidence of corporate governance effects on firms' environmental issues and innovation (Amore, Bennedsen, & Nielsen, 2015; Bunget et al., 2009; Clark, 2015; Dialysa, 2015; Iraldo, Testa, & Frey, 2009; Radu, 2012).

Though corporate governance is mostly related to management and the structures of an entity (Bunget cited in Alina, n.d.), it is intensely related to CSR and ethical business practices. Amore et al. (2015) showed poor corporate governance reduces firms' environmental innovations. This issue has received considerable attention from both policymakers and academia due to its potential to reduce GHG emissions. The literature also supports the view that poorly governed firms face more difficulties in raising investment needed to finance potentially expensive projects such as green technologies. Hence, good corporate governance acts as a catalyst for developing and implementing green policies in the business. In the following discussion, we describe some salient features of governance structure and their likely relation with environmental performance.

2.1 | Board size

A common perception is that a larger board will be more accountable and committed to environmental issues. A larger board would usually be more visible and under greater scrutiny of the regulatory authority and face strong pressure from various stakeholders (Brown & Deegan, 1998; Patten, 2002). Moreover, a larger board tends to demonstrate their actions are legitimate and consistent with good corporate citizenship. Malik, Difang, Ahmad, Naseem, and Rehman (2014) argued a large board can enhance a bank's performance as well as governance. Among others, the existence of a large board is important for monitoring and controlling (Shakir, 2008). In contrast, Yermack (1996) suggested the smaller the board, the better is the firm's performance as large boards are found to be slow in decision-making. Moreover, larger boards might face problems of social loafing and free riding (Lipton & Lorsch, 1992). The aforementioned discussion proves the optimum size of the board and its effect on the environmental performance of firms are inconclusive. With this uncertainty, we draw the following hypothesis.

Hypothesis 1a: *Board size has a negative impact on the extent of green compliance*

2.2 | Board independence

The inclusion of outside directors in the board might create pressure on corporate decision-makers to disclose more information about firms (Forker, 1992). Also, independent directors can exercise the power of independent judgment for the improvement of organizational performance through their objective view of the organization's operations and experiences. As such, a positive relationship between strong environmental performance and board independence is reported in Uyar, Kilic, and Bayyurt (2013); de Villiers, Naiker, and van Staden (2011). However, some experts have pointed out several deficiencies with independent directors' involvement on the board. They argue independent directors' lack of sufficient time and knowledge of company affairs limit their capacity to fulfil the demands of their position (Mittal, 2011). In contrast, De Andres and Vallelado (2008) showed the independent board might prove more effective in monitoring and advise to create more social values. Thus, the following hypothesis is formulated.

Hypothesis 1b: *Board independence has a positive impact on the extent of green compliance*

2.3 | Auditor's type

Appointments of one of the "Big4" audit companies have been used as a proxy for audit quality in past studies (Akhtaruddin & Haron, 2010; Velte, 2016). As a consequence, it is expected the appointment of one of the Big4 audit firms will lead to higher-quality audits. Owusu-Ansah (1998) concludes such practices encourage audited firms to disclose more information in annual reports. Such findings are in line with Healy and Palepu (1993) who confirm firms appoint one of the Big4 audit firms to improve their disclosure and quality of communication to stakeholders. Similarly, Joshi and Gao (2009) reported the extent of corporate social and environmental disclosure increases the appointment of Big4 audit firms for multinational companies. Such results extend the generalizability of the findings of Xiao, Yang, and Chow (2004). In contrast, Chau and Gray (2010) reported the negative impact of audit firm size and the extent of voluntary disclosure. Thus, the following hypothesis is formulated.

Hypothesis 1c: *Auditor type has a positive impact on the extent of green compliance*

2.4 | Accountability

One of the compelling reasons for banks to comply with the green banking policies is accountability. Accountability reflects the initiative taken by banks in submitting green banking report in a specific and timely manner to the board of directors. Banking sector faces huge responsibility and accountability due to their financing role. The absence of a strong mechanism to evaluate projects prior to financing may indirectly lead to environmental pollution (Shaumya & Arulrajah, 2016). It is also reported green banking promotes environmental accountability and environmental performances of a business (Bai, 2011). Bangladesh Bank requires all financial institutions to disclose green banking activities in a timely manner (Bangladesh Bank, 2012). Thus, the following hypothesis is formulated.

Hypothesis 2a: *The extent of green compliance has a positive impact on accountability*

2.5 | Profitability

In many cases, the environmental management system resulted in lower risk, greater environmental stewardship, and an increase in operating profit (Jeucken, 2001). According to Nath (2014), the rate of interest on loans given for green projects should be comparatively lower than the standard rate of interest. The author also points out companies can increase their profitability by reducing or recycling waste and also by adopting sustainable measures to go green. Similarly, energy-saving equipment like solar hot water systems, highly

efficient furnaces, heat pumps, and replacement windows lead bank to save cost (Ginovsky, 2009 cited in Nath, Nayak, & Goel, 2014). Laskowska (2018) identified two essential benefits of the green banking sector—"for the economy and nature" where banks can make a profit and also be cost-effective in the long-term perspective. Hossain and Kalince (2014) argue green banking has a positive effect on banks' performance. Thus, the following hypothesis is formulated.

Hypothesis 2b: *The extent of green compliance has a positive impact on profitability*

2.6 | Reputation

Firms increase environmental performance to solidify their reputation to the society (Neu, Warsame, & Pedwe, 1998). Papastergiou and Blanas (2011) mentioned some critical reasons for banks to integrate sustainable environmental banking. These include higher reputation and branding, improved quality of banks' portfolio, and lowered insurance liabilities and compensation claims. In the context of Bangladesh, there are no objective criteria for measuring a bank's reputation. Banks' reputation depends on how well they can manage their portfolio. An essential component of portfolio management is the bank's strength to manage various types of risks, which is believed to be reflected in banks' credit-rating score. As a result, banks that are good at managing risks are considered reputable. According to Dharwal and Agarwal (2013), green banking is a key to mitigate reputation risk. Thus, the following hypothesis is formulated.

Hypothesis 2c: *The extent of green compliance has a positive impact on reputation*

The aforementioned discussion on the relationship between the benefits of green compliance and their antecedents is summarized through a conceptual model in Figure 1. The causes emphasize the impact of internal and external governance mechanisms on green compliance in creating a sustainable business, which eventually provides several benefits such as accountability, profitability, and reputation.

2.7 | Control variables

The model provided in Figure 1 mentions the firm-specific needs that have been characterized by size, age, and leverage. Green innovators are usually larger (in size), older, and significantly more engaged in R&D spending (Amore et al., 2015). Again, the availability of financial resources is a critical determinant of socially responsible corporate activities (Hong et al., 2012, cited in Amore et al., 2015). Also, firms with more access to capital are largely capable of being environmentally friendly. In fact, prior studies provide evidence of both high and low degree of leverage affecting CSR compliance. While Brammer and Pavelin (2008) argued a low level of leverage imposes less limitation on management's direction toward CSR activities, Purushothaman, Tower, Hancock, and Taplin (2000) empirically show a positive association between leverage and CSR compliance.

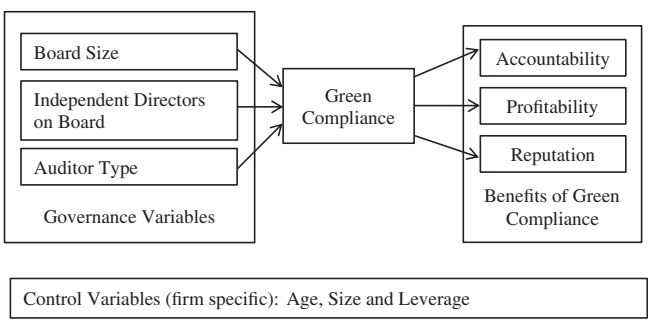

FIGURE 1 Model underpinning the benefits of green compliance

3 | METHODOLOGY

3.1 | Green compliance index development

This research follows the general guidelines provided by Bangladesh Bank to determine the level of green compliance. Bangladesh Bank issued a comprehensive green banking policy to be implemented by all commercial banks over three phases (Bangladesh Bank, 2011). These guidelines are provided as a response to the global warming, which aims to promote resource efficiency as well as low-carbon industries.

As of 2013, all scheduled banks have their own Green Banking Policy guidelines approved by their respective boards. They also have green banking unit (GBU) to pursue green banking activities. In addition, they have their own Green Office Guide for conducting in-house green activities (Bangladesh Bank, 2015). These policy guidelines cover policy formulation and governance, incorporation of environmental risk in Core Risks Management, initiating in-house environment management, utilization of climate risk fund, introducing green marketing, employee training, consumer awareness, and green event and disclosure of green banking activities in several phases.

Phase 1 is related to the development of green banking policies to show a general commitment to the environment through in-house performance. Accordingly, banks are required to formulate and adopt broad environmental or green banking policy, initiate environment management, introduce green finance, and implement online banking system to fulfil the requirements. Phase 2 requires banks to implement the policies developed in phase 1 by setting up green branches, improving in-house environment management, developing a bank-specific environment risk-management plan, and disclosing green banking activities. The final phase expects banks to address the complete ecosystem through environmentally friendly initiatives.

After careful analysis of requirements of the Central Bank policy guidelines for green banking, 14 items are identified to frame a green compliance index (GCI). These items are divided into three phases; a score of one is given for compliance and 0 otherwise. The GCI was sent to the Head of GBU of 56 commercial banks to get primary information on the extent of green compliance based on the standards set by the governing authority. Participants were assured of confidentiality and anonymity of their responses. A total of 40 useful responses were received. Table 1 provides GCI and the level of compliance by Islamic and conventional banks.

The analysis shows banks comply with 76% of the green banking guidelines provided by the central bank. Regarding policy formulation and governance, private commercial banks are falling behind the Islamic banks as seen in Table 2. Formulation of green banking policy

TABLE 1 Variable definition

Variables	Predicted sign	Definition
Green compliance		Total green compliance score
Phase 1 (P1)		Total green compliance score for phase 1 items
Phase 2 (P2)		Total green compliance score for phase 2 items
Phase 3 (P3)		Total green compliance score for phase 3 items
Board size	+	Total number of director on board
Board independence	–	Total number of independent directors on board
Auditor type	+	1 if big 4 audit firm is appointed, 0 otherwise
Age	+	A total number of years the bank is in operation starting from the establishment date
Size	+	Natural logarithm of total assets
Leverage	+	Total liabilities divided by the total asset
Benefits of green compliance		
Profitability	+	Net profit after tax divided by the total asset
Accountability	+	1 if the bank prepares a separate green compliance report for its board
Reputation	+	Credit rating received by the bank

as per the direction of Bangladesh Bank is compiled by the 73% of private commercial banks whereas the rate is 79% for Islamic banks.

Data related to governance, firm-specific, and benefit indicators were collected directly from the annual report of 2014. Bangladesh Bank has set a timeframe to comply with the green banking policy guidelines. December 31, 2013 was the deadline to comply with Phase 3. Therefore, annual reports for the year ending December 2014 should sufficiently reveal the compliance status of banks.

3.2 | Models

The hypotheses developed in Section 2 are tested using multiple linear regression analysis. All governance variables are expected to have a linear relationship with the green compliance; green compliance is expected to have a linear relationship with the dependent variable (benefits of green compliance). As explained here, regression models used to test the hypotheses in the study are provided later:

$$GC = \alpha + \beta_1 BS + \beta_2 IND + \beta_3 AT + \beta_4 AGE + \beta_5 SIZE + \beta_6 LEVERAGE \quad (1)$$

$$BGC = \alpha + \beta_1 GC_1 \quad (2)$$

where GC is green compliance, BGC is benefits derived from green compliance, BS is board size, IND is independent directors on board, AT is auditor's type, AGE is the total number of years in operation of a particular bank, SIZE is the natural logarithm of the total asset, and LEVERAGE is financial leverage.

TABLE 2 Green compliance score of selected banks

		IB	CB
		In %	In %
Phase I: Development of green banking policies			
1	Your bank has separate green banking unit/cell	100	75
2	A senior executive is responsible for managing green banking issues	100	82
3	The green banking unit reports to the boards/top management	100	82
4	Bank has taken specific steps to save electricity, water, paper, and reuse of equipment inside the organization	100	100
5	Bank has taken a plan to use solar energy/already uses solar energy	33	46
6	Bank gives preference to finance (provide loans) eco-friendly business and industry	100	96
7	Bank has implemented an online banking system	100	100
Phase II: Implementation of green banking policies			
8	The bank has a specific green banking policy for internal purpose	100	89
9	Bank does internal communication in-house (internally)	89	89
10	Bank has a separate green branch	0	7
11	Bank has specific environmental risk management plan	100	86
12	Bank has started publishing independent green banking and sustainability reports	67	54
Phase III: Introduction of innovative green banking products			
13	Bank has decided to introduce innovative green banking products	67	71
14	Bank has taken a plan to publish a separate report on green banking in a standard format with external verification	44	50
	Average score per category	79	73
	The average score for all banks		76

CB: conventional banks; IB: Islamic banks.

TABLE 3 Descriptive statistics of the selected sample

	Mean			Median	Std. deviation	Minimum	Maximum
	Full	IB	CV	Full sample			
Board size	15.70	15.70	15.81	15.00	5.43	6.00	32.00
Board independence	1.07	1.07	1.00	0.50	1.23	0.00	4.00
Auditor type	0.63	0.62	0.65	1.00	0.49	0.00	1.00
Total green compliance	0.75	0.75	0.73	0.79	0.14	0.36	0.93
Green compliance (phase 1)	0.86	0.86	0.84	0.86	0.15	0.43	1.00
Green compliance (phase 2)	0.66	0.66	0.64	0.80	0.18	0.20	0.80
Green compliance (phase 3)	0.58	0.58	0.56	0.50	0.37	0.00	0.10
Profitability (ROA)	0.01	0.01	0.01	0.01	0.01	−0.02	0.03
Reputation	3.03	3.25	2.94	4.00	1.46	0.00	5.00
Accountability	0.45	0.45	0.48	0.00	0.50	0.00	1.00
Leverage	8.20	8.20	7.65	9.65	5.14	2.46	22.69
Age	19.70	19.70	19.09	17.00	12.93	3.00	57.00
Size	25.30	23.31	25.24	25.77	1.11	23.33	27.20

CB: conventional banks; Full: full sample; IB: Islamic banks; ROA: return on asset.

4 | RESULTS AND DISCUSSION

4.1 | Descriptive statistics

Our final sample constitutes of 31 conventional and 9 Islamic banks. Descriptive statistics of independent, dependent, and control variables are shown in Table 3. The Central Bank of Bangladesh published the "Code of Governance" in 2004 to ensure well-functioning and involved board. According to the guidelines provided by the central bank, the recommended size of the board is 7–15 directors. On average, the board comprises of 15 members for both Islamic and conventional banks as provided in Table 3. However, the maximum and minimum values provided in Table 2 indicate several banks are yet to follow the recommended board size.

The Corporate Governance policy guidelines do not specify the number of independent directors to be included on the board of financial institutions in Bangladesh. The policy emphasizes the board should be composed of a substantial number of independent directors who are neither closely related to nor directly employed by the members of the executive committee. The mean score of the independent director is 1.07 for both clusters of banks (Table 3). Therefore, it is evident banks nominate independent directors to follow the corporate governance (CG) guidelines. However, the study finds several banks without independent directors on the board and the maximum number of independent directors appointed by a bank is four. On average, 62% of the sample banks have appointed one of the big 4 audit firms.

Reliability of the contents of the self-developed GCI was checked with Cronbach's Alpha. An alpha value greater than 70 % works as a rule of thumb to prove the reliability and consistency of the developed instrument (Tavakol & Dennick, 2011). The alpha score of our developed index is 0.84. Now, the results of correlation analysis for all variables provided in Table 4 reveal a large number of positive (above 0.50) and significant (at 5% level) associations between the variables. All of these correlations are below 0.70 except between size and reputation. Furthermore, size is a control variable in the model and is not subject to any hypotheses. Besides, independent variables do not have high correlations. Therefore, it is unlikely multicollinearity can cause a bias against significant findings in the study.

4.2 | Regression results

The results of the regression analysis are shown in Table 5. Model 1 shows the results of the first regression model presented in

TABLE 4 Correlation results for variables

		1	2	3	4	5	6	7	8	9	10
1	Green compliance	1.00									
2	Size	0.415[a]	1.00								
3	Leverage	0.347[b]	0.692[a]	1.00							
4	Profitability	0.25	0.564[a]	0.357[b]	1.00						
5	Board size	−0.25	−0.393[b]	−0.22	0.01	1.00					
6	Board independence	0.13	0.546[a]	0.461[a]	0.318[b]	−0.06	1.00				
7	Audit type	−0.04	0.24	0.08	0.04	−0.23	0.18	1.00			
8	Reputation	0.17	0.759[a]	0.409[a]	0.326[b]	−0.579[a]	0.471[a]	0.30	1.00		
9	Accountability	0.28	0.22	0.15	0.20	0.03	0.07	−0.03	0.12	1.00	
10	Age	0.29	0.656[a]	0.361[b]	0.373[b]	−0.447[a]	0.483[a]	0.314[b]	0.641[a]	−0.18	1.00

[a] Correlation is significant at the 0.01 level (2-tailed).
[b] Correlation is significant at the 0.05 level (2-tailed).

TABLE 5 Multiple regression scores

Model 1: Green compliance								
	Total		Phase 1		Phase 2		Phase 3	
	β	*t*-value	β	*t*-value	β	*t*-value	β	*t*-value
Full sample								
Board size	−0.101	0.557	−0.336	−2.422**	−0.117	−0.633	0.004	0.023
Board independence	−0.122	−0.624	0.019	0.116	−0.217	−1.095	−0.057	−0.245
Auditor type	−0.153	−1.02	0.206	1.345	−0.095	−0.547	−0.040	−0.245
Age	0.032	0.160	−0.127	−0.747	0.108	0.459	−0.435	2.435**
Size	0.415	2.809**	−0.078	−0.470	0.266	0.912	0.489	−2.164**
Leverage	0.115	0.557	−0.077	−0.494	0.042	0.858	0.203	0.951
Adjusted R^2	0.150		0.111		0.123		0.103	
F-value	7.889**		5.868**		0.772		3.246**	
Durbin-Watson	2.259		1.998		1.781		2.188	
Conventional banks								
Board size	−0.115	−0.550	−0.409	−2.412**	−0.003	−0.355	−0.002	−0.101
Board independence	−0.203	−0.978	−0.027	−0.152	−0.671	−1.240	−0.470	−0.439
Auditor type	−0.132	−0.725	0.122	−1.393	0.003	0.033	−0.016	−0.095
Age	0.068	0.263	−0.173	−0.933	0.001	0.225	−0.009	−1.-32
Size	0.363	2.098**	−0.188	−0.907	0.061	0.872	0.111	0.800
Leverage	−0.039	0.868	−0.250	−1.393	−0.005	−0.434	0.010	0.449
Adjusted R^2	0.102		0.138		0.112		0.081	
F-value	4.403**		5.819**		0.504		0.355	
Durbin-Watson	2.357		1.694		1.883		2.194	
Islamic banks								
Board size	−0.148	−0.715	−0.341	−1.125	−0.066	−0.578	−0.493	−1.234
Board independence	−0.098	−0.393	0.139	0.361	−0.192	−2.870	0.373	1.129
Auditor type	−0.244	−1.272	0.069	0.209	−0.192	−2.780**	−0.058	−0.221
Age	0.057	0.268	0.231	0.728	1.095	3.252**	−0.667	−2.613
Size	0.098	0.290	−0.455	−0.929	−0.264	−0.578	0.750	2.939**
Leverage	0.853	4.317**	0.590	1.934**	1.059	3.479**	0.366	0.405
Adjusted R^2	0.688		0.255		0.630		0.543	
F-value	18.639**		3.745**		4.400**		5.747**	
Durbin-Watson	1.222		1.785		2.468		2.712	

Model 2: Benefits of green compliance						
	Profitability		**Accountability**		**Reputation**	
Full sample	β	*t*-value	β	*t*-value	β	*t*-value
Green compliance	0.164	2.663**	0.391	4.464*	0.393	4.483*
Adjusted R^2	0.439		0.554		0.783	
F-value	4.478**		6.520*		17.02*	
Conventional banks	β	*t*-value	β	*t*-value	β	*t*-value
Green compliance	0.320	3.216**	0.435	4.118**	0.414	3.944*
Adjusted R^2	0.556		0.634		0.759	
F-value	5.312*		6.975*		11.827*	
Islamic banks	β	*t*-value	β	*t*-value	β	*t*-value
Green compliance	0.434	1.274	0.462	1.852	0.635	5.588**
Adjusted R^2	0.072		0.125		0.900	
F-value	1.623		1.257		17.16**	

*Significant at <0.01.
**Significant at <0.05.

Section 3.2. Total green compliance and scores of each three phases of green compliance are regressed with independent and control variables. The models representing total, phase 1, and phase 3 are significant ($p < 0.05$) with the overall adjusted explanatory power of 15, 11.1, and 10.3%, for the full sample. The regression analysis was repeated for the conventional and Islamic banks separately. While the

total and phase 1 green compliance models are significant for conventional banks ($p < 0.05$), all green compliance models are significant for Islamic banks at $p < 0.05$.

Model 2 provides the results of the regression model where total green compliance is positioned as a predictor of the benefits of green compliance. Profitability, accountability, and reputation are used as proxies for the benefits of green compliance. Regression results for each model are provided in Table 5. Similar to the Model 1, regression analysis was conducted for the full sample, conventional, and Islamic banks separately. Results indicate the model with the full sample can explain 43.9, 55.4, and 78.3% of the variation in profitability, accountability, and reputation of the selected banks, respectively.

Hypothesis 1a states board size has a negative impact on the extent of green compliance. Regression results of Equation (1) show board size negatively influences the extent of green compliance for the full sample. These results are consistent with the findings of Lipton and Lorsch (1992) and Yermack (1996), which show that a large board faces difficulty in decision-making. On average, selected banks maintain a board with 15 members and the maximum number of members found for a board is 31. Such a huge board may cause a delay in deciding on the appropriate strategy to achieve the green compliance requirements set by the Central bank. Overall, the results of this study provide sufficient support for Hypothesis 1a. Thus, Hypothesis 1a is accepted.

Hypothesis 1b states board independence has a positive impact on the extent of green compliance. The regression results fail to prove a significant relationship between board independence and green compliance. Thus, Hypothesis 1b is rejected. This can be explained by the fact that the level of independent member's involvement in the board of commercial banks in Bangladesh is minuscule. Or in other words, the number of independent members at present is below the minimum threshold level at which independent members can have a significant contribution to firms' decision-making. Appointing one of the Big 4 audit firms shows a significant negative impact on the extent of green compliance among Islamic banks. Such results are not consistent with the common perception that reputed audit firms influence their clients to increase voluntary disclosure. The results of this study do not provide enough evidence to support Hypothesis 1c. Thus, Hypothesis 1c is rejected. Among the three control variables, size has a significant positive impact on green compliance. The positive impact of age and leverage on green compliance is found for Islamic banks only.

Hypothesis 2a, Hypothesis 2b, and Hypothesis 2c state the level of green compliance has a positive impact on accountability, profitability, and reputation of banks, respectively. Regression results for the full sample in Table 5 show the extent of green compliance has a significant positive impact on each measure of the benefit of green compliance. Similar results are reported for conventional banks as well. However, green compliance has a significant positive impact on the reputation of Islamic banks alone. Overall, the results of the study support Hypothesis 2a, Hypothesis 2b, and Hypothesis 2c. These results clearly indicate an increase in green banking activities can lead to an increase in profitability, accountability, and reputation for the banking sector in Bangladesh.

5 | CONCLUSION

This article has attempted to explore the extent of green compliance of both conventional and Islamic banks in Bangladesh. In so doing, a GCI was prepared to assess the level of compliance of banks to environmental codes provided by the Central Bank of Bangladesh. Multiple regression techniques were applied to examine the impact of green compliance on several benefits, such as accountability, profitability, and reputation. Results show both conventional and Islamic banks have a positive attitude toward green banking, environmental awareness among employees as well as clients and automation of banks. Among all scheduled banks, Islamic banks are found to be more compliant with green banking guidelines than their conventional counterparts.

Among governance variables, we have found the board size has a negative impact on the extent of green compliance for the selected commercial banks in Bangladesh. We have explained this situation arguing too many members of the board may delay critical decisions related to green compliance. In Bangladesh, green banking is still in its infancy. Compliance with green codes may cost banks in the short run although it may bring long-run benefits. If a board contains too many members, they tend to have diverse opinions as to whether the bank should sacrifice its current profit in exchange for future benefits that are uncertain. Similarly, regression results fail to show any significant impact of independent directors on green compliance. Such results are expected, given the fact that the number of independent directors in corporate boards is still lower than the minimum threshold required to exert a meaningful impact on the corporate decision-making. Regression results also show the extent of green compliance has a significant positive impact on each measure of the benefits of green compliance. However, green compliance only has a significant positive impact on the reputation of Islamic banks. These findings link the spirit of green banking to the core principles of Islamic banking. As a Muslim majority country, it is expected consumers of Islamic banks would have a greater sensitivity toward Shari'ah principles and support Islamic banks' progreen initiatives.

The findings of this research forward several policy implications. At present, banks' green initiatives are mostly confined to compliance with the central bank's guidelines. In so doing, banks are mostly unaware of the real opportunities and threats brought about by the climate change. Climate change can enormously affect financial institutions by changing their client's risk profile. At the same time, green banking products can help banks penetrate new markets for profitable expansion. This urges individual banks to carefully scrutinize clients' carbon risks and include these risks to the long-term risk-management strategy of banks. Second, the central bank should clearly sketch a carbon-reduction roadmap for financial institutions. As part of this strategy, commercial banks can be required to include more independent directors on the boards. Third, conventional banks are lagging behind their Islamic counterparts with regard to green compliance. However, the long history of legitimate survival of conventional banks implies they should be more committed to environmental concerns. In other words, a combination of Islamic and green ideas, along with initiatives from conventional banks, would certainly add more values to the final consumers and create an environmentally friendly sustainable future for the country.

Further research on the effect of Islamic and conventional banks as well as the effects of macroeconomic and microeconomic determinants

on green banking and finance is required to draw comprehensive and effective policy recommendations. In particular, the impact of corporate governance on green financing deserves special attention. Future studies may further investigate the motivation of banks for engaging green initiatives in different regions by developing a survey instrument.

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How to cite this article: Sharmeen K, Hasan R, Miah MD. Underpinning the benefits of green banking: A comparative study between Islamic and conventional banks in Bangladesh. *Thunderbird Int. Bus. Rev.* 2018;1–10. https://doi.org/10.1002/tie.22031