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BENEFITS THAT ISLAMIC AND CONVENTIONAL BANKS CAN ATTAIN BY IMPLEMENTING GREEN BANKING

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ABSTRACT

This paper aims to ascertain the benefits that Islamic and conventional banks in Bangladesh can reap by implementing green banking, and also the drivers that motivate banks to behave environmentally. The Green Compliance Index (GCI) was introduced here to measure banks' environmental behaviour. It was prepared based on central bank guidelines. In this study, with the participation of all 40 private commercial banks (PCBs), 32 conventional banks and 8 Islami Shariah-based PCBs, firm specific variables were collected through content analysis of the GCI. Structural equation modelling-partial least squares (SEM-PLS), together with the bootstrapping method, were used to evaluate the research data. These were collected and sorted from the FY annual report of 2018. For further support, a Generalized Linear Model (GLM) was used to assess the outcomes. The results show that the effects of green compliance on possible benefits are significantly higher for Islamic banks. In contrast, these banks comply less with the green banking codes than conventional banks do in Bangladesh. Company size and the independence of bank directors appear to have a significant influence on compliance with the green banking codes, while governance does not show such an association for either group of banks. As Islamic banks have a greater scope to attain benefits, policymakers should introduce more interactive green banking products and loan schemes for prospective consumers, especially in industrial sectors where there is a greater possibility of being sustainable and environmentally friendly. Based on the findings, policy recommendations are made for practitioners, regulators and future researchers.

Keywords: Green compliance, Climate change, Islamic banks, Conventional banks, Green banking benefits.
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I. INTRODUCTION

1.1. Background

The existence of the atmosphere is shared by all global commons, both developed and developing countries, and no nation can escape the worsening warming effects of the global climate crisis. Many obvious and negative results of climate change are being experienced in the form of rising sea levels, intense heatwaves, shrinking glaciers, floods, tsunamis and changes to the range of plants and animals. "These outcomes threaten sustainable living in this planet which calls for an urgent and collective response from both developed and developing countries" (Miah & Rahman, 2018, p. 23).

The adverse consequences of climate change require a serious and united response from both industrialised and advanced, as well as emerging countries (Sharmeen et al., 2019). The response to climate change effects involves radical changes in how global economies, together with daily life, are organised. Greenhouse gases (GHGs) are emitted in production and consumption processes. Therefore, accelerated national action is crucial in order to change modes of production and consumption by transforming technologies, implementing this at various levels of the economy.

Financial institutions such as banks are in a strategic position to play a pioneering role in creating and maintaining a green revolution for the planet. "These institutions can implement a 'go-green' policy for themselves and can encourage client firms for the same by initiating various incentive mechanisms" (Sharmeen et al., 2019, p. 735). As banks play a considerable role in financing commercial projects for organisations, the 'green' concept has enormous potential. Green finance means that investments are only made in projects in which the emission of greenhouse gases is minimal, and the carbon footprint is transparent. By pursuing this strategy, banks can motivate their existing and potential clients to undertake environmental cooperative projects. Although this initiative might increase customers' operational and production costs marginally, the long-term effects will be in the banks' favour. Therefore, in terms of banking activities, green banking involves extra care for the planet's ecosystem, atmosphere and natural resources (Islam et al., 2014).

Bangladesh, being at the development stage, needs green banking activities far more, as it has a higher level of vulnerability to the hostile consequences of climate change. It is trying harder and harder to increase its GDP so that the densely populated country can fight against the poverty of its low-income citizens. The Bangladesh Bureau of Statistics (BBS) stated that the country had achieved success in improving its GDP over the last few years (BBS, 2014). Being financial bodies, banks play a critical role in contributing to the financial success of the country. Hasan and Miah (2018, p. 135) state that "a booming banking sector successfully adjusted and supplied required funds for increased investment activities accelerated by the rising income of the middle class and along with that they are proposing new but striking loan products to their clients". As a result, this segment is having a considerable effect on the on-going sustainable environmental movement in the country through the introduction of 'green' banking practices (Hasan & Miah, 2018).

Despite very worthy endeavours from the national government and international development agencies, the movement towards green banking

activities has not advanced as quickly as it should have. This can be attributed to many reasons, including lack of awareness of green banking on the part of banks and their client firms. However, the main cause of this behaviour by banks can be attributed to their excessive focus on profit and their failure to realise the benefits of going green.

In the case of Bangladesh, conventional banks dominate the overall financial system. However, according to some research findings, Islamic banks are steadily growing and taking a large share of the sector. Although profit is a primary motive for both types of bank, Islamic banks are expected to be also concerned with satisfying the social purposes of justice in line with Shari'ah. Shari'ah principles dictate that Islamic banks have an ethical and holy obligation to be environmentally concerned (Suzuki & Miah, 2016). It is argued that asset managers' quest for a balance between moral and Shariah-compliant investing, renewable financial products and ecological agriculture is developing in Islamic investment (Vizcaino, 2014). Moreover, Shariah principles give Islamic banks a competitive advantage in the area of green compliance, as Islamic rules and regulations focus on the development of the community. Therefore, it can be expected that Islamic banks will be more concerned about the environment than their conventional counterparts. This research is an attempt to examine this hypothesis.

Although it is timely and a pragmatic issue, the research gap related to this aspect is very limited worldwide and more so in the case of Bangladesh. Very few studies have focused on this issue in the context of Bangladesh, and their results are conflicting. For instance, Ali and Rahman (2015) found in the 2013 annual reports of five commercial and Islamic banks in Bangladesh that in terms of the environmental dimension of CSR activities, the banks' efforts were similar. This finding contradicts the results of Chintaman (2014), who showed that in the context of the GCC region, Islamic banks undertook CSR activities more creatively, while conventional banks were only on par with to Islamic banks regarding CSR practices. Later, Sharmeen et al. (2018) attempted to establish some of the underpinning advantages that can be derived from executing green banking parameters in the moral ground, especially in Islamic banking in Bangladesh.

1.2. Objectives

This study, therefore, is an effort to present the current status of green initiatives by banks in Bangladesh and to observe whether Islamic banks are gaining more benefits than conventional banks by implementing green banking, and if so, what these are. The research further seeks to explain the existing institutional frameworks enacted to restrain and encourage banking institutions to behave environmentally. As there is a dearth of research in this area, the findings of this research will help regulatory authorities and policymakers to formulate policies to increase the focus on the banking sector. The motive is unambiguous and clean. Banks, as the core profit-making financial institutions, are not willing to spend money on green issues which will not directly contribute to revenue generation. If it can be shown that banks will attain benefits by implementing green issues, they will more readily comply with sustainable environmental conditions directed by the central bank, and subsequently, be encouraged to act accordingly.

II. LITERATURE REVIEW

2.1. Background Theory

"While the risks of climate change for South Asia emerge as quite serious, the risks and impacts for Bangladesh are arguably amongst the highest in the region" (World Bank, 2013). This study refers to Bangladesh as a potential hotspot which is projected to face serious natural disasters. Considering long-term sustainable development will be the best option for the developing country to deal with these. The sustainable development concept, which focuses on 'conserving the earth's natural resources' (Amacker, 2011), can be undertaken by reducing the carbon footprint at the individual, organisational level. To work with the risk of climate change, more attention needs to be paid to attaining environmental sustainability, which is one of the vital three pillars of sustainability (the triple bottom line concept) and which emphasises maintenance of the quality of our surrounding environment (Klarin, 2018). To achieve long-term environmental sustainability, financial institutions can play a crucial role by taking green finance seriously.

It is anticipated by the World Bank (2010) that "a sea-level rise of one meter is expected to affect 13 million people in Bangladesh". In response, the Bangladesh government, other regulators and banks, have formulated and implemented substantial environmentally-friendly policies (Bose et al., 2018). As banks hold a large share of the financial sector's assets (Zadek & Robins, 2015), the central bank of Bangladesh is continuously developing guidelines to comply with the 'green' concept.

Recent trends in green financing in Bangladesh "reveal that so far, 55 banks out of 56 have taken green banking programs by establishing green banking unit" (BB, 2016). According to a Bangladeshi bank report (2017), a total amount of $2022.85 million had been invested as green finance during the October-December quarter of FY17 by all banks. In terms of the focus on sector-wise input, it was shown that private commercial banks played the key role (80.9 percent).

Many studies show that intervention by the central bank has a strong positive impact on the implementation of green banking (Ramnarain & Pillay, 2016; Oyegunle & Weber, 2015). To comply with the process and to motivate banks to go green, the Bangladeshi government has proposed various benefits to the country's banking sector (Oyegunle & Weber, 2015). For example, at the beginning of 2016, a new refinancing scheme called the Green Transformation Fund (GTF) of BDT 17,000 million (approx. $200 million) was implemented to ensure the sustainability in export-oriented textile and leather sectors, with BDT 3,413.63 million (approx. $40.43 million) spent up to December 2017 under the revolving "Refinance Scheme", which gives a 5% window on loan interest premiums for commercial banks (Bangladesh Bank, 2017).

Along with conventional banks, Islamic-based shariah banks can enjoy the benefits of this scheme. BB distributed BDT 52.00 million (approx. $0.62 million) for the "Working Environment and Fire Safety of Factories under a shariah-based refinancing scheme during October-December, 2017 quarter and has also has collected BDT 0.50 million profit under this scheme" (BB, 2017). Four Islamic banks agreed to create investing renewable energy and reinforce the involvement of shariah-based financing (BB, 2017).

However, regulation cannot guarantee the full phase compliance by banks. Bose et al. (2018) found pragmatic evidence that implementing green banking is more than a routine procedure as time passes, but instead becomes more innovative. Therefore, it is essential to motivate banks towards green compliance by showing the positive outcomes and other benefits (Laskowska, 2018; Oyegunle & Weber, 2015; Lalon, 2015). It has also been observed that banks who adopt a sustainability strategy "consistently outperform in terms of valuation, profit/loss and return on equity (ROE)" (Ramnarain & Pillay, 2016; Straw, 2013; Eccles et al., 2011). Global Systemically Important Financial Institutions (GSIFIs) propose five significant benefits for green banks in having better coverage of clients in terms of attracting deposits and offering loans, which eventually lead to higher growth in assets and income, and better returns on assets (as cited in Ramnarain & Pillay, 2016).

Besides, Laskowska (2018) identified two essential benefits of the green banking sector: lucrative benefits "for the economy and nature where banks can make a profit and also be cost-effective in a long-term perspective". Laskowska gave an example of small and medium companies who are recipients of PolSEFF and receive investment premiums (10% or 15% PolSEFF financing) when projects are based on renewable energy sources. In a similar vein, Hossain and Kalince (2014) claim that green banking has a positive influence on banks' enactment and profitability after tax and will create sustainable growth in the long run.

Moreover, to attract major investors who are struggling with the conventional banking system, Benedikter (2011) suggests shifting more to social banking, where "most of them are in search of a better perspective of transparency and reliability". Papastergiou and Blanas (2011) indicate several effective reasons why more banks are pursuing green environmentally-friendly banking systems; for example, they had a "higher reputation and branding, improved the quality of a bank's portfolio and lowered insurance liabilities and compensation allege". Besides, regarding Greek banks, they claimed that the benefits of being ecological outweighed the costs. Likewise, Indian banks also implement green policies, which lead them to win-win situations by helping them to raise their productivity and to reduce costs (Yadav & Pathak, 2013).

In line with the above discussion, this study considers that if more vital benefits can be presented to commercial banks, policymakers will definitely be able to implement more green banking. Hence, one of the objectives of this study is to demonstrate the particular benefits (see Figure 1) that both conventional and Islamic banks will receive by complying with the green compliance index and whether there are any significant differences between the two types of bank. Another objective is to establish the research gap between the circulation of BB green banking compliance guidelines and the extent to which banks (both conventional and Islamic) comply with the on-going practices. One additional noticeable impact of this research, which considers governance frameworks and firm-specific variables (discussed later) as antecedents of banks' environmental performance and will show the level of the positive (or negative) influence of governance and firm-specific variables on the extent of green compliance.

2.2. Previous Studies

Developed countries are more provoked to environmental deprivation, and therefore countries such as Bangladesh should focus more on sustainable development. Banks can contribute to developing a healthy environment by mostly financing eco-friendly projects and by limiting investments in polluting industries. To achieve optimal results, banks' commitment to internal practices such as the use of efficient electronic gadgets, energy-saving mechanisms, recycling of paper, and limiting the use of energy and water needs to be established within organisations.

Green banking in Bangladesh can help achieve a strong reputation and alertness of all parties in financial sectors by adopting green products such as solar and renewable energy, solid and liquid waste management, biogas plants, and emission-free brickfields. The banking sector in Bangladesh is already contributing to the environment in both internal and external ways. Internally, banks have reduced their carbon footprint by using less paper by offering online and mobile banking, by using energy-efficient cooling and lighting systems and reusing water and other products.

"All 47 banks (as of 2013) have their own Green Banking Policy Guidelines approved by their respective Board of Directors/Competent authority as well as have Green Banking Unit (GBU) for pursuing Green Banking activities. They also have their own Green Office Guide for conducting in-house green activities" (Bangladesh Bank Report, 2015). 43 banks have introduced a full range of green finance services, directly (38 banks) or indirectly (30 banks). BDT 0.127 million (about USD 1497.07) was disbursed in the April-June 2018 quarter.

For our research, all 32 conventional banks and eight Islamic banks have been considered. The policy guidelines for green banking suggested by the Central Bank consist of various sections, which we have incorporated into seven categories. A comprehensive assessment was made to ascertain the green compliance of the 32 private commercials and eight Islamic banks with the seven green banking guidelines (Appendix I).

According to our analysis, around 87% of banks, both Islamic and commercial, have already established individual green banking cells and policies, and have regularly published brief information in their annual reports. The remaining 13% are in the process of doing this. Private commercial banks are at the forefront compared to Islamic banks in framing policies and governance. 59% of Islamic banks comply with obtaining board/regional head approval for green banking policies, while more than 70% PCBs comply with this. An interesting observation is that the amount of funds received from BB for green banking purposes is higher for Islamic banks. However, fund allocation for green banking, utilisation of funds and formation of green banking units are superior in conventional banks in Bangladesh.

The question of morality should also be an issue for Islamic banks, which are encouraged more to adopt green practices for a better future compared to conventional banks. From our observations, we have seen that ethical ground employs here in more of paperwork rather than from the internal drive.

III. METHODOLOGY

3.1. Data

Currently, 59 scheduled banks are operating in the country, which is categorised as state-owned specialised banks, private commercial ones, Islamic and foreign banks. Due to the differences in reporting standards (for foreign banks) and the purpose of operations (specialised and state-owned commercial banks), these two categories were not included in the study, which left a sample of 40 private commercial banks, out of which 32 were conventional and eight Islami Shariah-based PCBs. According to the Bangladesh Bank, these commercial banks hold 52.12 percent of the overall deposits of the banking industry, which makes them an appropriate representation of the total population. The data were collected from FY 2018 annual reports in order to acquire governance and firm-specific information..

3.2. Model Development

As discussed earlier, sustainable development can be achieved by implementing green policies, with development coming from two core reinforcements – governance and firm-specific needs. In our research, we considered the above three parameters as the 'causes' behind green banking compliance for scheduled banks in Bangladesh. These causes emphasise the active co-operation between them and the mediator, the green compliance index (GCI), in creating a viable business which eventually provides results, for example, accountability, profitability, reputation and moral ground, in the form of comprehensive benefits from complying with green banking.

a. Governance Variables

Board size and the number of independent directors were considered to represent firm governance. It was assumed that a large board would be more united and more devoted to the environment. Studies have shown that for this reason, large boards are under more regulatory surveillance and more pressure to act ecologically (Brown & Deegan, 1998; Patten, 2002). In certain countries, a large board size is positively related to better performance (Malik et al., 2014). In other cases, well-structured boards perform well in shareholding monitoring and control (Shakir, 2008).

Independent directors (INDs) are another significant variable which has been increasingly used in recent studies, many of which have shown that INDs can act with less bias, make independent judgments of all operations of a firm, and are more committed to CSR activities (Forker, 1992, De Villiers et al., 2011; Uyar et al., 2013). Therefore, the following hypotheses were formulated:

H1: Governance has a positive association with green compliance.

H1a: Board size has a positive association with green compliance.

H1b: The number of independent directors on a board has a positive association with green compliance.

b. Firm-Specific Variables

In this model, the firm size was measured by the value of total assets, age and leverage, which were considered for the evaluation of firms' specific needs. "Green innovators are usually larger (in terms of size), older, and significantly more engaged in R&D spending" (Amore et al., 2015). Firms which have more access to capital are more capable of 'going green'. When a firm has less debt, it can dedicate more to CSR activities (Purushothaman et al., 2000). Based on these facts, the following hypotheses were formulated:

H2: Firm-specific variables have a positive association with green compliance.

H2a: Age has a positive association with green compliance.

H2b: Board size has a positive association with green compliance.

H2c: Leverage has a positive association with green compliance.

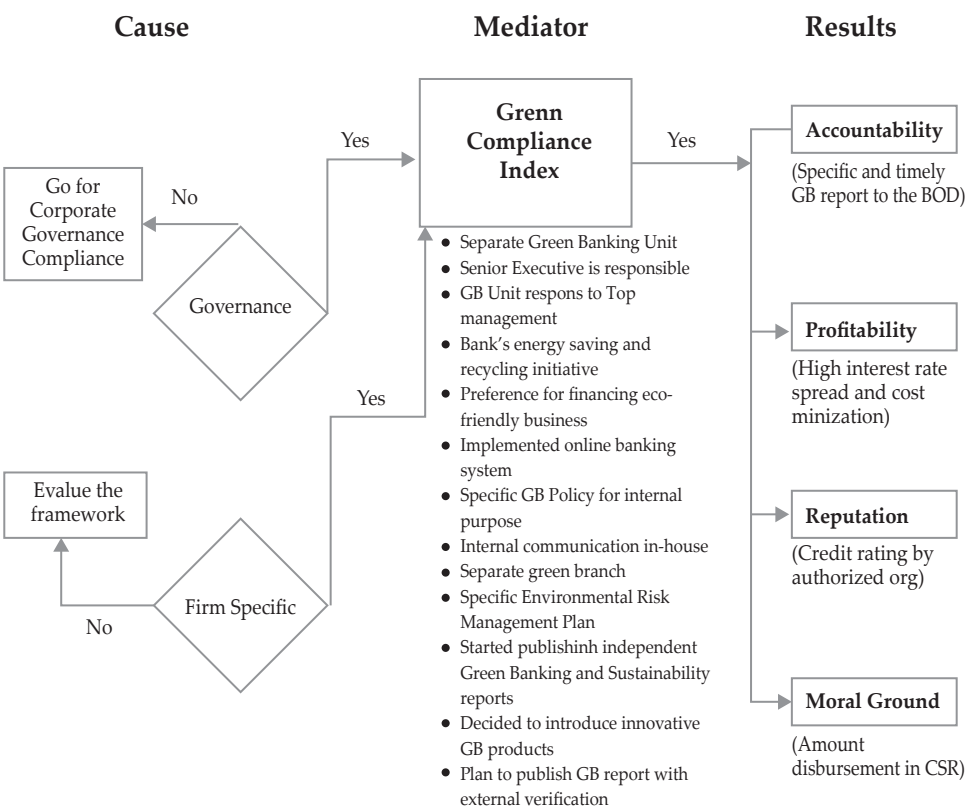

Figure 1.
Underpinning and Benefits of Green Banking Compliance

c. Green Compliance Index

In the model, the Green Compliance Index (GCI) works as a mediator. From 2011 to 2014, the central bank provided green banking policies for all commercial banks, in which thirteen requirements (see Figure 1, Mediator column) were considered

for the compliance index (Appendix II, Green Compliance Index Survey results). As such, the extent of green compliance is measured through content analysis by using a self-developed index following Bangladesh Bank guidelines. A score of 1 is given to banks that comply with items on the index, and 0 otherwise. The sum of the scores for all items is divided by the number of items. Therefore, a bank's green compliance index will range between 0 and 1 (Appendix II). The green compliance index was sent to the head offices of all forty banks to obtain information. Information on all the other variables was gathered from the annual 2018 reports. Four benefits of green compliance were identified, namely accountability, moral ground, reputation and profitability. According to our research, the underlying benefits of complying with green banking come with efficiency, accountability, profitability, innovation, reputation and moral ground.

Accountability: Another important benefit for banks is accountability from complying with GCI. In this paper, we measure the accountability of banks who submit reports on time to the authorities. Under Phase II, Bangladesh Bank requires the disclosure and reporting of green banking activity for all commercial banks (Bangladesh Bank, 2012).

Profitability: Another independent variable is profitability, which can be derived by implementing green in the financial sector. Through reinvestment schemes, firms receive subsidies on interest when issuing loans, and green banking also reduces operational costs by reducing the carbon footprint and recycling waste (Jeucken, 2001; Nath, 2014; Ginovsky, 2009). We have calculated increase profitability for getting more interest rate spread and also cost minimisation.

Reputation: Financial institutions which emphasise being green rather than simply on profit-making activities create a long-term impression in the eyes of stakeholders (Neu et al., 1998). It has been found that banks' commitment to CSR leads to better credit rating scores. Banks which are good at managing risk are considered reputable in society. As such, banks' credit rating scores are regarded as a proxy for reputation.

Moral ground: In this research, the moral ground was measured by the amount disbursed on CSR activities by scheduled banks, with a positive relationship between bank morality in the eye of stakeholders and GCI expected. In Bangladesh, the direct and indirect budgetary CSR commitments of banks and financial institutions have increased considerably since 2008. The increasing level of financial involvement in CSR has raised concerns about the appropriate allocation of funds in environmental projects by concerning commercial banks (Bangladesh Bank CSR report, 2015). The above discussion, therefore, leads us to the following hypotheses:

H3: Green compliance has an affirmative connotation with expected benefits.

H3a: Green compliance has an affirmative connotation with accountability.

H3b: Green compliance has an affirmative connotation with the moral ground.

H3c: Green compliance has an affirmative connotation with profitability.

H3d: Green compliance has an affirmative connotation with reputation.

3.3. Method

The study includes four variables. First, the governance and firm-specific variables are independent ones that affect the extent of green compliance in the selected banks. The level of governance is measured by board size and the number of independent directors on the board. Firm-specific variables include age, size and gearing. The degree of green compliance is also used as both an independent and dependent variable to predict the benefits generated through an extensive literature review.

Table 1.
Variable Definition

Variable	Definition
Independent Only	
Board Size (BS)	Total number of directors on board.
Independent Directors (IND)	Total number of independent directors on board.
Age	Number of years the bank has been operating.
Size	Natural logarithm of total assets.
Gearing	Total liabilities divided by total equity.
Both Dependent and Independent	
P1 for first level	Total score for first level substances.
P2 for second level	Total score for second level substances.
P3 for third level	Total score for third level substances.
Dependent Only	
Profitability	Net profit divided by total assets.
Accountability	1 when a bank makes a distinct green compliance statement for its board.
Moral Ground	Natural log of CSR expenditure.
Reputation	Credit rating score obtained by bank.

A Structural Equation Modelling - Partial Least Squares (SEM-PLS) approach was applied to analyse the above data, employing Smart PLS 3.0 to measure the statistical significance of the model and the acceptability of the developed hypotheses. PLS is a widely accepted method to test the reliability and validity of a theoretical model (Becker & Ismail, 2016). It has been primarily used for models with latent variables. However, evidence exists that indicates that SEM-PLS can also be used with secondary data-based models. We used the bootstrapping method (with 200 resamples) to determine the significance levels of the loadings, weights and path coefficients (Chin, 1998; Gil-Garcia, 2008). An additional validity test and regression analysis were conducted in SPSS 23.

IV. RESULTS AND ANALYSIS

4.1. Results

Among the total 40 selected banks, 32 were conventional and eight Islamic. The highest standard deviation was seen in the age of the banks, which indicates diversity in the sample regarding experience. A few of the commercial banks were founded in the last four years, while most started operations in the 1980s. A low level of standard deviation in one of the benefits, with profitability indicating that the level of return among the banks was similar.

Table 2.
Descriptive Statistics of the Selected Sample

	BS	IND	AGE	Gearing	Size	P1	P2	P3	Acc	ROA	MG	Rep
Mean	14.000	2.000	22.640	12.381	25.867	0.850	0.651	0.590	0.900	0.006	17.905	3.150
Median	14.000	2.000	19.000	12.335	26.288	0.857	0.800	0.500	1.000	0.007	18.524	4.000
Std. Dev.	4.142	1.076	13.542	5.393	1.049	0.157	0.176	0.360	0.307	0.016	3.265	1.368
Skewness	-0.070	-0.267	0.673	-0.056	-1.311	-1.023	-0.785	-0.286	-2.726	-1.561	-4.544	-0.943
Kurtosis	-1.141	-0.034	0.476	1.638	1.120	0.280	-0.581	-0.979	5.722	10.465	24.812	0.090

a. Collinearity Statistics (VIF)

A variance inflation factor (VIF) was tested to detect whether or not the predictors were correlated with each other in the model. Ringle et al. (2015) argue that a VIF of less than 5 is acceptable. In this case, all the indicators are valid, and the variance in their particular coefficients would expect to have no multicollinearity; i.e. there is no correlation with other predictors.

Table 3.
Collinearity Statistics (VIF)

Indicator	VIF	Indicator	VIF
BS	1.109	P2	1.415
IND	1.109	P3	1.159
Age	1.439	Accountability	1.651
Gearing	1.347	Profitability	1.430
Size	1.825	Profitability	1.430
P1	1.252	Moral Ground	2.178

b. Measurement Model

The reliability of the contents of the self-developed green compliance index was checked with Cronbach's alpha. "An alpha value greater than seventy percent works as a rule of thumb to prove the reliability and consistency of the developed instrument" (Tavakol & Dennick, 2011; Nunally, 1978; Nunally & Bernstein, 1994; Hair et al., 2010; Urbach & Ahlemann, 2010). Table 4 shows the alpha values (Hair et al., 2010) for the whole model. Firm-specific, green compliance and benefits proved their reliability, with alpha values of 0.721, 0.853 and 0.791 respectively, while governance failed to cross the seventy percent threshold.

A two-step approach was used to test the validity of the measurement model, following the suggestions of Anderson and Fornell (2009). First, convergent validity was assessed based on the information provided in Table 4. "Convergent validity can be ascertained if the loadings are greater than 0.50" (Bagozzi & Yi, 1991; Nunally, 1978; Hair et al., 2010); if composite reliability is greater than 0.70 (Gefen et al., 2000; Hair et al., 2010; Fornell & Larckel, 1981) and if the average variance extracted is greater than 0.50 (Fornell & Lacker 1981; Hair et al., 2010; Urbach & Ahlemann, 2010; Barclay et al., 1995). Moreover, CR provided higher bound values which did not underestimate the true reliability or exaggerate the consistency of the outer loadings, which is the case with Cronbach's alpha (Peterson & Kim, 2013). Based on the selected criteria, the construct reliability and validity of the whole model is consistent, whereas the loading and composite reliability of governance was affected.

Table 4.
Construct Reliability and Validity

Parameter	Measurement items	Loading	Cronbach's alpha	CR	AVE
Governance	Board Size	0.387	0.477	0.691	0.572
	Independent Directors on Board (BS)	0.922			
Firm- Specific	Age	0.750	0.721	0.830	0.623
	Gearing	0.721			
	Size	0.911			
Green Compliance	Level 1 (P1)	0.808	0.853	0.747	0.506
	Level 2 (P2)	0.785			
	Level 3 (P3)	0.511			
Benefit	Accountability (ACC)	0.997	0.791	0.817	0.549
	Moral Ground (MG)	0.946			
	Profitability (ROA)	0.564			
	Reputation (REP)	0.885			

Discriminant validity was tested using the Ringle and Sarstedt (2015) and Fornell and Lacker (1981) criterion. Based on the results provided in Tables 4 and 5, we found that the correlations for each construct were less than the square root of the average variance extracted (AVE), which indicates adequate discriminant validity, apart from a single path from governance to benefit in the heterotrait-monotrait ratio. As the construct has the strongest relationships with its own all other indicators in the PLS path model (Hair et al., 2017), it was kept in the model for further analysis.

Table 5.
Discriminant Validity of the Constructs

Construct	Governance	Firm- Specific	Green Compliance	Benefits
Governance	0.756			
Firm-Specific	0.552	0.789		
Green Compliance	0.342	0.366	0.711	
Benefits	0.572	0.552	0.381	0.741

4.2. Robustness Test

The structural model was tested using SMART PLS 3.0 and bootstrapping with 200 resamples. Figure 2 and Table 6 show the results. The adjusted R^2 values ranged from 0.145 to 0.463 percent, which suggests that the modelled variables can explain 14.50 to 46.30 percent.

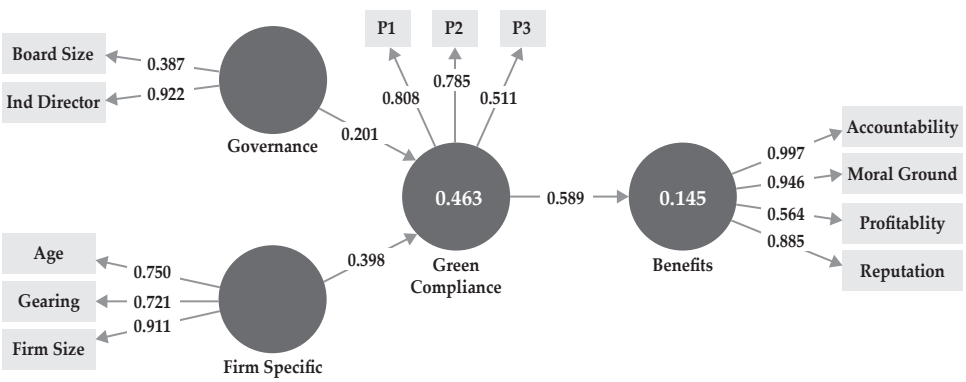

Figure 2.
Structural Equation Modelling Results

Table 6 shows the results of the path coefficient and hypothesis tests. Among the indicators of the firm-specific variable, size has the most significant influence on the extent of green compliance, with a factor loading of 0.911. The extent of green compliance has a significant influence on accountability (0.997), moral ground (0.946) and reputation (0.885), with higher loadings than profitability (Figure 2 and Table 4). Governance was not found to have a significant association with green compliance among the banks. However, the number of independent directors has the second-highest factor loading of 0.997.

Additional statistical tests were conducted with IBM SPSS 23 to justify another claim. First, multiple linear regression analysis was performed to determine the association between green compliance and benefits, along with board size, number of independent directors, age, leverage and size. The results, shown in Table 7 strengthen our claim, as size (β = .767, t- value = 3.715, p<.05) is the most

Table 6.
Path Coefficients and Hypothesis Testing

Hypothesis	Parameter	All Banks			Conventional	Islamic
		Coefficient	t-value	p-value	Coefficient	Coefficient
H1	Governance -> Green Compliance	0.201	0.908	0.364	0.165	0.116
H2	Firm-Specific -> Green Compliance	0.398	2.354**	0.015	0.432**	0.189
H3	Green Compliance -> Benefits	0.589	2.627*	0.004	0.653*	0.702*

**p<0.05; *p<0.01

significant predictor of green compliance of the selected banks. Likewise, the number of independent directors was found to be a significant parameter in all three scenarios. Among the benefits, accountability emerges as an important factor for all banks and selected conventional banks.

Table 7.
Regression Results

Independent Variable	Dependent Variable	All Bank			Conventional Bank			Islamic Bank		
		Coefficient	t-value	Sig.	Coefficient	t-value	Sig.	Coefficient	t-value	Sig.
Green Compliance	Acc	0.426	2.868*	0.007	0.476	2.918*	0.007	0.614	1.904	0.106
Independent Director	Green Compliance	.791	2.952**	.023	.861	3.042*	.003	.695	2.50**	.038
Size	Green Compliance	.767	3.715*	.000	.803	4.158*	.000	.369	1.86	.067

**P<0.05; *P<0.01

Multivariate analysis using a general linear model (GLM) was then conducted to determine the association between green compliance and desired benefits included in the structural model. The multivariate test results, shown in Table 8 match the PLS results, as green compliance, is found to have a significant positive association with a reputation (β = 2.384, p<.05), accountability (β = 4.619, p<.05) and moral ground (β = 9.591, p<.05).

Table 8.
Multivariate Tests

Independent Variable	Dependent Variable	All Banks Coefficient	Conventional Coefficient	Islamic Coefficient
Green Compliance	Profitability	1.407	.955	10.33
	Reputation	2.384**	1.285	2.965*
	Accountability	4.619*	4.896*	3.127**
	Moral ground	9.591*	4.776**	35.193*
Adjusted R2		.781	.774	.969

**P<0.05; *P<0.01

4.3. Analysis

The three-tier analysis was conducted to investigate the existence of a moderation effect of the nature of the bank in the context of green compliance. First, the developed structural model was run twice in SmartPLS 3.0 by splitting the file into two, containing only conventional or only Islamic bank data. The loadings of each construct changed, and in the model, two paths were found significant. One path was from green compliance to benefits, which remained significant for both conventional and Islamic banks, and the other was from firm-specific to green compliance, in which only conventional banks were significant. The loading scores for both models are shown in Table 6.

The second part of the analysis consisted of running regression analysis for selected cases, first for conventional and second for Islamic banks, to determine any difference in the results between the association of governance and firm-specific components and green compliance. The regression results shown in Table 7 are very different for the two different types of bank. While size remains the most significant predictor of green compliance following the results of the selected conventional banks, the presence of independent directors was found to affect green compliance for the overall model, including for Islamic banks. The interesting point was that no positive association was found between board governance and green compliance. In contrast, the presence of independent directors on boards had a positive influence on both types of bank. Therefore, the possible moderation of the nature of the bank needs to be tested.

A test of the difference in slopes was conducted for moderation analysis (Lowry & Gaskin, 2014). Possible moderation of the bank nature was tested for each path by putting the bootstrapping results into an Excel macro taken from the StatWiki website (Gaskin, 2016). Table 9 shows the results of the moderation tests. The paths from green compliance to benefit and from firm-specific to green compliance were found to be significantly different, which indicates positive moderation of the nature of the bank. This implies that the effects of green compliance on possible benefits are significantly higher for Islamic banks than for conventional ones. This claim is further supported by the multivariate test results shown in Table 8, where it can be seen that Islamic banks benefit more in terms of reputation and moral ground. At the same time, the reverse scenario is true for accountability.

Besides, the f square (effect size) value in Table 9 is fairly consistent with the mediating results, which measure the strength of each predictor variable in explaining the endogenous variables of the model. Only the path from green compliance to benefits has a moderate effect (f square=0.17, which is greater than 0.15), whereas the other two paths indicate a weak effect (less than 0.02) (Chin, 1998; Cohen,1988; Hair et al., 2014).

Table 9.
Difference in Slope Test for Mediating

	t-statistics	f square
Governance -> Green Compliance	0.934	0.034
Firm-Specific -> Green Compliance	1.978**	0.054
Green Compliance -> Benefits	3.763**	0.170*

**p<0.05; *p<0.01

In the literature, we found that some researchers (Clark, 2015; Dialysa, 2015; Radu, 2012; Iraldo et al., 2009; Amore et al., 2015; Bunget et al., n.d.) indicated a relationship between good governance and better environmental performance. In line with this, independent directors positive association with the board provides support for hypothesis H1b, which is also backed by many other studies (Mittal, 2011, De Andres & Vallelado, 2008, Shakir, 2008). According to the guidelines of the 2014 Bangladesh Bank Code of Governance, the recommended size of the board is 7–15 directors. On average, boards comprise 14 members from both Islamic and conventional banks, with an average of two independent directors, as shown in Table 2. In the case of Bangladesh, the concept and implementation of independent directors are not executed at their full potential in the banking sector. Therefore, hypotheses 1, 1a and 1b are accepted.

The results are shown in Figure 2, and Table 6 provide a clear indication that the firm-specific variable positively affects the extent of green compliance among the selected banks. Therefore, hypothesis 2 is accepted. Based on the regression results presented in Table 7, we can conclude that size has a significant positive association with the extent of green compliance in the case of the full sample and that of conventional banks only. At the same time, independent directors are a positively significant predictor of green compliance for both Islamic and conventional banks. Age was not found to have a significant association with green compliance in any of the models. These results prove that bigger companies have greater motivation to go green. Therefore, hypotheses 2b and 2c are accepted.

Finally, the association between the extent of green compliance and the expected benefits were investigated, which is the prime focus of this study. Based on the results shown in Figure 2 and Table 6, it can be concluded that the extent of green compliance has a positive impact on the level of benefits that can be attained by the banking industry. The results are consistent with the full sample (all 40 scheduled banks), conventional banks only (32 banks) and Islamic banks only (eight banks). Only profitability shows little association. These results are consistent because of some of the new banks started their operations after 2015 and 2017, where they were still at the survivor stage. The results are also widely supported in the literature.

In the literature, it has been seen that accountability has a very positive relationship with green banking, with the strict surveillance of Bangladeshi banks, perhaps being a good reason for this. Reputation is one of the significant benefits that encourages both Islamic and conventional banks in Bangladesh. In contrast, the moral ground is more applicable to Islamic banks. The GLM test results in Table 8 confirm that the extent of green compliance has a significant positive association with reputation, accountability and moral ground. As such, hypotheses 3a, 3b, and 3d are accepted. No such association was found between profitability and the benefits of green compliance. However, the government of Bangladesh is helping banks through a refinancing scheme. Therefore, hypothesis 3c is rejected.

The difference in the results between Islamic and conventional banking in the various tests generated the possibility of a moderating effect of the nature of the banks. As a result, a difference in slope test was conducted to determine whether the association two variables was higher for Islamic banks than for conventional

ones. As previously discussed, a moderating test was performed for all the paths in the structural model. However, only the path from green compliance to the outcome was found to be significant. As a result, we can conclude that the level of benefits attained through green compliance is higher for Islamic banks than for conventional ones.

V. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

Green banking in Bangladesh has focused on developing a culture within organisations based on governance in order to adopt national and international best practice and to share know-how with peer groups. In our research model, we incorporated the underlying causes, both governance-related and firm-specific, with the green banking compliance index and examined the significance level of several benefits, namely accountability, profitability, reputation and moral ground. In the first phase of the examination, it was seen that firm-specific factors had a positive association with the green compliance index, whereas governance was not significantly associated. Governance is a fairly new concept in the banking industry, so we believe it will take some time to make its mark on the green compliance scenario. Although not significantly associated, the indicators used to measure the level of governance identified some basic relationships. On the other hand, independent directors have a very influential effect on compliance with green banking issues, which can create potential scope for policymakers to emphasise the inclusion of the right proportion of independent directors on boards. Furthermore, green compliance is also positively associated with the underlying results, which means that if banks comply with green policies, they will gain more benefits, which will increase their accountability, reputation and particularly their moral ground. Only profitability receives slightly less attention, which may be explained by banks' reluctance to spend more money on items which do not directly generate revenue. These results statistically support our expectations regarding green compliance scenarios for both Islamic and conventional banks in Bangladesh. As expected, moral ground is rated highly by Islamic banks, which is in accordance with the Islamic view. In the second phase of our examination, we found that among the three hypotheses, only execution of green banking provided more benefits to Islamic banks than conventional ones. The first two hypotheses did not have such significant consequences for Islamic banks than conventional banks. Green banking creates more advantages which are supported by Islamic principles. Overall, green banking is backed by Islamic Shariah law. The majority of the Bangladeshi population is Muslim, so it is expected that consumers of Islamic banking will have a greater sensitivity toward Shariah principles and support Islamic bank initiatives in going green. The World Bank has already predicted that the effects of climate change will be higher for developing countries such as Bangladesh. Therefore, a mix of Islamic and green concepts in Bangladesh, with commercial banks, would undoubtedly add more value to end-users, as well as create a viable future for the country.

5.2. Recommendations

As discussed earlier, the study found that the level of benefits attained by banks through green compliance is higher for Islamic banks than for conventional ones. In order to gain maximum benefits, policymakers need to introduce effective mechanisms to support the implementation of green banking. As people have more faith in *Shari'ah*-based banking, more products can be offered in this area to increase market share. Strong surveillance and monitoring systems by the authorities need to be in place in the utilisation of all received funds. The regulatory bodies should play a proficient role and have no option to neglect or become lenient with non-compliers. Bangladesh Bank needs to give more emphasis on conducting further research on these issues. It should offer more subsidies to banks to implement green banking. Some of the recommendations about green policies are listed below:

Banks should provide green loans to develop environmentally friendly homes and industries. When the question of energy-efficient home arises, people tend to think only about solar panels. However, there are other efficient ways available to create more environmentally friendly homes, such as cool roofing; water-saving irrigation systems; heating and cooling systems, such as central air-conditioning and smart thermostats; window upgrades; insulation improvements; use of Energy Star appliances, such as dishwashers, refrigerators and washing machines; LED lighting; pool pumps; and landscaping.

Banks should also develop and provide more green credit cards to customers. These can be a tech-tool to screen and deal with the utilisation of merchandise and enterprises that radiate ozone-harming substances. Green credit card clients could be awarded e-points, which could be changed into money or donated to ecological development funds when they purchase eco-accommodating items, use public transport, make paperless exchanges, or consume less energy, water and gas. Such cards may offer scope for electric vehicle charging services and the acquisition of reused car parts. Moreover, they may sustain the market for low-carbon items and services, subsequently driving eco-advancement and the move to a low-carbon economy.

Mobile banking and internet banking can play a vital role in paperless transections and green banking. Nowadays, the use of mobile banking has made a significant change in terms of paperless transactions. However, there remain gaps related to security issues, which must be made more constructive, secure and strict. The regulatory bodies must pay attention to these initiatives carefully.

Banks could develop Remote Deposit Capture (RDC) services for their clients. This is a framework that enables clients to examine cheques remotely and send pictures of them to banks for a deposit, usually via an encrypted internet connection. When the bank receives a check picture from the client, it deposits into the client's account. It makes the funds accessible, depending on the client's specific accessibility plan. RDC encourages eco-friendly services with fewer system errors.

Researchers should develop innovations and ideas in terms of eco-friendly products and go-green products. The central bank could arrange competitions to encourage the innovation of new green products and services, or to reform existing products or services to make them eco-friendly.

Banks should provide specific chapters on green banking in their annual reports, which should include green exercises, such as the areas in which specific costs have decreased for the non-usage of carbon footprints; where and how the expenditure on green products is measured; and how much extra revenue innovative green products can generate. This information would help monitor the system and go-green policies and also add value to people in general and to those who intend to conduct specific research on the topic of green banking.

The government should introduce tax exemptions in some particular cases of green banking for two years; e.g., in the case of green credit cards, green loans and green projects. Moreover, the government should award financial institutes for effecting green policies.

To enjoy the benefits of the Islamic concept, conventional banks in Bangladesh should open more Islamic branches, where clients can relate green initiatives more closely with Islam. Meanwhile, banks that still have not adopted their own separate green cells should complete the process, and regulators must continue monitoring the development on time.

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APPENDIX 1

Appendix 1.
Green Banking Checklist based on Bangladesh Bank Circular

1. Policy Formulation and Governance	Year	
1.1 Formulation and Board/Regional Head approval of green banking policy as per the direction of Bangladesh Bank.	Yes	No
1.2 Amount of funds received from Bangladesh Bank for green banking purposes (in million taka)	Amount	
1.3 Allocation of funds in the budget for green banking (in million taka)	Amount	
1.4 Utilization of funds (in million taka)	Amount	
1.5 Formation of green banking unit	Yes	No
2. Incorporation of Environmental Risk in Core Risk Management (CRM)		
2.1 No. of projects applicable for Environmental Due Diligence (EDD)	Quantity	
3. Initiating of In-house Environment Management		
3.1 No. of branches and booths	Quantity	
3.2 No. of branches powered by solar energy	Quantity	
3.3 No. of booths powered by solar energy	Quantity	
3.4 Introduction of green office guide or general instructions		
3.6 Inventory Details		
3.6.1 Consumption of water (in million taka)	Amount	
3.6.2 Consumption of paper (in million taka)	Amount	
3.6.3 Energy consumption (in million taka) (Electricity, Gas & Fuel)	Amount	

Appendix 1.
Green Banking Checklist based on Bangladesh Bank Circular (Continued)

4. Utilization of Climate Risk Fund			
4.1	Fund for part of CSR activities (events) related to climate change (in million taka)	Amount	
5. Introducing Green Marketing			
5.1	Introduction of green banking products (please specify)	Yes	No
6. Employee Training, Consumer Awareness, and Green Events			
6.1	No. of training programs/seminars /workshops/ awareness programs exclusively conducted for green banking	Quantity	
6.1.1	Name of the program type with numbers (example: one workshop, two seminars)		
6.2	Green Events (please specify)	Quantity	
7. Disclosure of Green Banking Activities			
7.1	Disclosure in annual report	Yes	No
7.2	Disclosure on website	Yes	No
7.3	Disclosure in the media	Yes	No
7.4	Preparation of independent green banking and sustainability report	Yes	No

Appendix 2.
Green Banking Compliance Index (GCI)

SL	Bank	Phase 1	Phase 2	Phase 3	TPS
	Conventional Bank				
1	AB bank	85.71%	40.00%	0.00%	41.90%
2	Bangladesh Commerce Bank Limited	85.71%	60.00%	50.00%	65.24%
3	Bank Asia Limited	85.71%	80.00%	50.00%	71.90%
4	Brac Bank limited	71.43%	40.00%	100.00%	70.48%
5	Dhaka Bank Limited	100.00%	60.00%	0.00%	53.33%
6	Dutch Bangla Bank Limited	85.71%	80.00%	50.00%	71.90%
7	Estern Bank Limited	100.00%	80.00%	100.00%	93.33%
8	IFIC Bank Limited	100.00%	80.00%	50.00%	76.67%
9	Jamuna Bank Limited	85.71%	80.00%	100.00%	88.57%
10	Meghna Bank	57.14%	20.00%	0.00%	25.71%
11	Mercantile Bank Limited	100.00%	80.00%	50.00%	76.67%
12	Midland Bank	85.71%	80.00%	50.00%	71.90%
13	Modhumoti Bank Limited	42.86%	80.00%	100.00%	74.29%
14	Mutual Trust Bank	100.00%	80.00%	50.00%	76.67%
15	National Bank Limited	100.00%	60.00%	0.00%	53.33%
16	National Credit & Commerce Bank Limited	100.00%	60.00%	50.00%	70.00%
17	NRB Bank Limited	100.00%	80.00%	50.00%	76.67%
18	NRB Commercial Bank Limited	85.71%	80.00%	100.00%	88.57%
19	NRB Global Bank Limited	71.43%	40.00%	0.00%	37.14%
20	One Bank Limited	57.14%	40.00%	0.00%	32.38%
21	Premier Bank Limited	85.71%	40.00%	100.00%	75.24%
22	Prime Bank Limited	71.43%	40.00%	100.00%	70.48%
23	Pubali Bank Limited	100.00%	60.00%	50.00%	70.00%
24	Shimanto Bank Limited	57.00%	40.00%	50.00%	49.00%
25	South Bangla Agriculture and Commerce Bank	57.14%	60.00%	100.00%	72.38%
26	Southeast Bank	100.00%	80.00%	100.00%	93.33%
27	Standard Bank Limited	85.71%	80.00%	100.00%	88.57%
28	The city bank Limited	100.00%	80.00%	100.00%	93.33%
29	Trust Bank Limited	100.00%	60.00%	50.00%	70.00%
30	United Commercial Bank Limited	57.14%	80.00%	50.00%	62.38%
31	Uttara Bank Limited	85.71%	60.00%	50.00%	65.24%
32	The Farmers Bank *****	57.00%	40.00%	50.00%	49.00%

Appendix 2.
Green Banking Compliance Index (GCI) (Continued)

SL	Bank	Phase 1	Phase 2	Phase 3	TPS
	Islamic Banks				
1	Al-Arafah Islami Bank Limited	100.00%	80.00%	50.00%	76.67%
2	Exim Bank Limited	85.71%	80.00%	100.00%	88.57%
3	First Security Islami Bank Limited	100.00%	80.00%	100.00%	93.33%
4	ICB Islamic Bank Limited	85.71%	60.00%	0.00%	48.57%
5	Islami Bank Bangladesh Limited	85.71%	80.00%	50.00%	71.90%
6	Shahajalal Islami Bank Limited	85.71%	40.00%	100.00%	75.24%
7	Social Islami Bank Limited	85.71%	80.00%	50.00%	71.90%
8	Union Bank Limited	85.71%	60.00%	50.00%	65.24%
	Average Score				
	Conventional Banks	83.03%	63.13%	57.81%	67.99%
	Islamic Banks	89.29%	70.00%	62.50%	73.93%