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"DOES GREEN ACCOUNTING PRACTICE AFFECT BANK PERFORMANCE? A STUDY ON LISTED BANKS OF DHAKA STOCK EXCHANGE IN BANGLADESH"

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Abstract

Green accounting practices have been getting growing attention from academicians, scholars, and practitioners. As one of the fastest-growing developing nations, Bangladesh is also concerned about the ecological challenges and their potential impacts on different sectors' overall performance. This study intends to examine the effects of green accounting practices on bank performance. The study deploys a panel dataset of 30 (All banks) banks from DSE listed Bangladeshi banks throughout 2009-2020. This study employed 2SLS (Two-Stage Least Square) to discover the influence of green accounting practices with three green thoughts from Bangladesh Bank's guidelines, including green investment, green initiatives, and green activity management. The results indicate that green investment is highly significant to increase bank performance. The green initiatives and green activity management are also substantial to influence bank performance. The study also reveals that the better the green accounting practices, the higher the banks' performance. We also investigate the robustness of the main findings through alternative estimation methods, pooled OLS (Ordinary Least Square), and Two-step System GMM (Generalized Methods of Moment) estimations and find similar results. This study is novel because of employing different proxies for green accounting practices and methodological contributions. Thus, as

complementary to Bangladesh Bank's initiatives on environmental accounting practices, the findings generated from this study have managerial implications for policymakers in corporations and the government.

JEL: Q51, Q52, Q56, E5.

1. Introduction

Environmental degradation and the latest global warming phenomenon, and the climate change debate have become central to the national discussion. An institutionalized business structure is desperately needed to cope with ecosystem costs and natural capital degradation (Panigrahi, 2017). In the last decades, states, legislators, activist organizations, businesses, and the public worldwide have become more aware of environmental concerns (Johnstone, 2018). Numerous debates have been held on climate transformation, environmental deprivation, ethics, marginalization, social duty, strong group voices creation, radicalism movements, and protests against capitalism (Adger et al., 2017; Azam, 2016). Environmental protection practices, which were confined to households and towns in the past, have become a commercial requirement (Miroshnychenko et al., 2017). In particular, the role of accounting has been applied to the measuring and analyzing of environmental aspects of an undertaking via environmental management accounting beyond the confines of traditional financial reporting (Cullen & Whelan, 2006). Green accounting is an accounting tool that provides information on the environment (called environmental costs), such as the amounts of waste generated, the amount of radiation emitted, emission of carbon, etc., in support of internal corporate decision making (Jasch & Stasiškienė, 2005). Considerable of green accounting study concentrates as an externally focused practice on environmental disclosures (Qian et al., 2011). Prior research on green accounting has shown that this approach is most beneficial to businesses in environmentally subtle manufacturing (Burrill & Schaltegger, 2010). The main argument is the twin goal of green accounting to lessen the adverse environmental influence of a manufacturing corporation and decrease operating costs associated with protecting the Environment (Burrill et al., 2010). But eco-friendly accounting is a complex and diversified phenomenon. As a result, there is an upward trend in environmental accounting, i.e., assembly and using ecological knowledge to improve management policymaking (Burrill et al., 2010; Burrill et al., 2011). However, more and more organizations have been faced with environmental accountability concerns, leading to growing global interest and greater stakeholder understanding. Environmental accounting and monitoring's financial intensity is increasingly a concern for taxpayers, states, creditors, and the general public (Maama & Appiah, 2019). In their day-to-day operations, organizations are also focused on protecting the environment. It shows that environmental problems (for example, waste, energy crises, climate change, etc.) build business entities' opportunities and not just threats (Thevanes & Arulrajah, 2016). When society is more

concerned with the performance of the environment, businesses have implemented environmental management practices. This benefited the organization both environmentally and economically (Shaumya & Arulrajah, 2017). Environmental consciousness has made people's ecological success around the world concerned with green accounts (Ahmad et al., 2018). Thus, this study adopts green investment concepts from Bangladesh Bank's guidelines as an independent variable.

Green accounting is characterized as the Green Accounting Reporting Information situation in the form of integrated, complete, and valid accounting information that is useful to users in the evaluation and the state of business responsibility for economic and non-economic decision-making. Economic, societal, and environmental aspects are the pointers cast-off to calculate the green accounting constituent. The financial component includes audits of financial records and financial statements (Susilo, 2008). Corporate social responsibility, social reporting, and social auditing are social factors (Chahal & Sharma, 2006; Puspitaningtyas, 2018). The environmental component includes environmental attention, engagement in environmental issues, environmental responsibility, environmental audits, and the monitoring of environmental problems (Astuti, 2014; Hati, 2018; Jahamani, 2003; Puspitaningtyas, 2018; Susilo, 2008). Thus, it is needed to report the green initiatives for the organizations as the environmental components. Also, by reviewing the green initiative's report, the green accounting practices can be monitored to perform green activities in the organizations. This number of green initiatives are also taken as an independent variable in this study. Bangladesh Bank also provides the guidelines on green accounting that should be exercised by the organizations; it is relevant to monitor the green activities with the formal session. The risk management committee is the committee that ensures the environmental accounting practices together with the risk managing aspects. Thus, the volume of risk management committees can play the role of effectiveness in green accounting practices. Therefore, green activity management has been taken as the risk management committee's volume to an independent variable in this study.

Environmental accounting and reporting have become particularly relevant to stakeholders and companies because of the impact on the financial comfort of an organization's social and ecological results (Prasmita et al., 2019). Stakeholder theory advocates that corporations encompass their participants to confirm maintainable profitability and reinforce stakeholder ties to guarantee a competitive business advantage (Abdullah et al., 2016). The institutional theory shows that the corporate, institutional climate strongly impacts the corporations' social, environmental, and economic success. This theory suggests that institutions, which govern their actions and operation, are integrated into networks of norms, values, rules, and beliefs. In reality, such cultural elements are social institutions, which stable over time and provide good scripts for intervention. Managers obey to organizations to become isomorphic with their systemic background to maximize the odds of organizational accomplishment by gaining credibility, a core concept of institutional thought, according to social expectations (Colwell & Joshi, 2013; DiMaggio & Powell, 1983). The institutional

sector allows for practices within companies that significantly affect social, economic, and environmental values (Berrone et al., 2013). This study draws on the underlying assumptions of the two famous theory namely Stakeholders theory and institutional theory, to play an essential role in social, political, and economic systems in which organizations function and gain acceptability. The green accounting studies (Egbunike & Okoro, 2018; Goswami, 2014; Horvat & Korošec, 2015; Kurantin; Markle, 2014; Modell, 2014; Riyadh et al., 2020; Sief, 2014; Suaryana, 2011; van Dijk et al., 2014) have evolved in recent years across the globe, but still unproven in the context of institutional and stakeholder approaches. Again, the previous studies (Branco & Rodrigues, 2008; Fleischman & Schuele, 2006; Omnamasivaya & Prasad, 2016; Riyadh et al., 2020) used the disclosure techniques as the proxy of green accounting practices. Some of the studies (Farouk et al., 2012; Malik & Mittal, 2015; Minimol & Makesh, 2014) didn't mention the determinants of green accounting practices. This study is novel because it proxied green accounting practices with three variables, including green investments, green initiatives, and green activity management adopted from Bangladesh Bank guidelines. More precisely, this study examines whether green accounting practices affect bank performance in the context of institutional and stakeholder approach. This study backs to the existing studies as well as Bangladesh (Ahmad, 2012; Islam & Deegan, 2008), Mauritius (Dineshwar Ramdhony, 2015), South Africa (Marx & Van Dyk, 2011; Van Zyl, 2013), India (Ghosh, 2015; Goswami, 2014), Indonesia (Mirfazli, 2008) and Malaysia (Sawani et al., 2010), and also the studies of (Egbunike & Okoro, 2018; Goswami, 2014; Horvat & Korošec, 2015; Kurantin; Markle, 2014; Modell, 2014; Riyadh et al., 2020; Sief, 2014; Suaryana, 2011; van Dijk et al., 2014) to enhance value in the green accountancy literature. This study adopts the stakeholder approach to contribute to the organization's responsibility to different stakeholders and the institutional approach for the corporations' societal, environmental, and financial success. Finally, it is relevant to say that this study has a methodological contribution in using different methods (GMM, 2SLS, Pooled OLS) to verify the robustness of the findings.

2. Literature Review and Hypothesis Development

2.1 Theoretical Background

2.1.1 Institutional theory

Carpenter and Feroz (2001) claim that institutional theory may clarify the choice of accounting regulations. The structural theory has been deliberated to explain accounting practice in society and organizations (Hoque & Alam, 1999). As businesses will have to adhere to and honor the expectations, customs, and standards that citizens of society value to obtain society's approval and, thus, gain credibility (Owen, 2013). Collison et al. (2009), in a new analysis from the United Kingdom, found that businesses are interested in getting involved by their peer group stresses in the FTSE4Good index. To be included in the index (Collison et al., 2009) reported that businesses must adequately disclose green and social information. Thus, Rahaman et al. (2004) suggest that it is necessary to ensure that corporations are ultimately looking for a State of credibility and

social support while evaluating the external reporting activities as part of the institutional practice. Islam and Deegan (2008) discovered that multinational consumers' pressure and force had forced local weardealers to start organizational communication to disperse concerns about improper work practices. Besides, Neu and Ocampo (2007) noted that some developing nations might be obligated to accept specific accountability and reporting procedures as indispensable by the World Bank to save funds from global bodies such as the World Bank. Yet institutional pressure is distinct, and it can be characterized as coercive, normative, and mimetic. These pressures can also come from multiple stakeholders; for instance, public organizations, manufacturers, consumers, and NGOs (Colwell & Joshi, 2013). External players, including government and NGOs, exert coercive pressure, and push businesses to enforce various environmental laws and standards (Roxas & Coetzer, 2012). The laws and guidelines of the environment are mandatory and obligatory for companies. Referring to institutional theory, the coercive burden can affect the establishments' environmental security and governmental directives (DiMaggio & Powell, 1983). The normative force is directed from vendors, consumers, organisations, such as trade unions and businesses, the broadcasting and other public organizations. Trade unions and other institutions are generally perceived to be the central institutions causing normative pressures (Colwell & Joshi, 2013; Latan et al., 2018). These burdens guarantee that external customers and suppliers, and organizations work in a socio-compliant way while encouraging green accounting practices. As businesses compete for superior results, there is mimetic pressure (Colwell & Joshi, 2013; Latan et al., 2018). Mimetic pressure promotes better control of the environment of international and global corporations. Companies may agree to disclose green information in light of institutional pressure to follow their peers' practice (Dineshwar Ramdhony, 2015). The study further suggested that transparency symbolizes one form of organizational practice. Companies encourage the practice of green accounting in solving environmental challenges occurring both internally and externally. This environmental challenge impacts society's environmental security. Besides, it can affect the environmental and ecological image of a business. Institutional pressure can influence the performance of companies (Colwell & Joshi, 2013).

2.1.2 Stakeholder Theory

It was noted that commercial green knowledge sharing is not a candid process that can be satisfactorily elucidated by a sole theoretical building (Kamla & Rammal, 2013). Legitimate positions and stakeholder theories are better seen as theories that enrich together. Stakeholder theory accepts that multiple stakeholder groups disagree about how an organization can be run (Dinesh Ramdhony, 2015). Owen (2013) observes a sparing range of research experiments exploring stakeholders' views on publishing green and social knowledge during a review report on green and social information. The thoughts of different stakeholder groups are also essential to research, and it is only by this that businesses can be more educated on how to answer the needs of the numerous stakeholder groups. The theory of stakeholders requires involved parties as the name suggests

(Deegan & Rankin, 1996). Stakeholders are persons, organizations or a collective of individuals who are legitimately active in the association. The stakeholder theory suggests that organizations are responsible for many different stakeholders, of which shareholders are only one (Friedman & Miles, 2002). Green accounting adopts stakeholder theory to meet various stakeholders' needs like society, environment, employees, customers, friends & family, competitors, and shareholders. The stakeholder model is grounded on supposing that industries can only be fruitful when they deliver worth to most stakeholders. The stakeholder theory indicates that stakeholders' interventions will influence cost savings, environmental impact, decrease the environment's uncertainty, and boost performance. Better use of green accounting will reduce environmental uncertainty. This reduction will also boost the use of the environmental conservation and economic performance of touchable and immaterial properties that support to organizations (Hofer et al., 2012). Various scholars have anticipated that stakeholder theory can help in improving goods and services management, attaining and retaining high-quality staff, enhancing reputation, solidifying consumer loyalty, maintaining competitive advantages, and reducing risk (Caldera et al., 2017; Mallak et al., 2018; Zailani et al., 2015; Zailani et al., 2019).

2.2 Green Accounting Practices and Bank Performance

In (Qureshi et al., 2012), the study of Green Reporting and Accounting research, identified as an environmental aspect of the Business Strategy, produces the requisite reporting and considers the various expertise needed for evaluation, overview, and interpretation data required. The report is an important part of the business strategy. The study centered in particular on report production and the extent of reporting for the diversity of corporate and organizational purposes. Researchers have also identified obstacles to environmental reporting and accountancy that an established environmental strategy and effective surveillance and oversight processes are a requirement for the world's environmental sustainability. It is very difficult to improve accounting, except if common people in Bangladesh are ignorant of environmental loss and protection.

The research of Trotman (1979) of the leading hundred (100) corporations in Australia (1967-1977) discusses the social and green accounting practices of the business classes. Trotman recommended the increase in information as a tactic for enhancing the public profile and public approval. Trotman and Bradley (1981) checked in the 1978 financial year disclosure of social and environmental responsibility rendered by 207 businesses, close to Trotman (Trotman, 1979). The authors specifically attempted to find various variables arising from the assessment of the current green and social liability literary documentation and the quantity of the releases. This consideration included societal limits, scale, structural risk and the timeframe for decision-making on management. Furthermore, the report offers scant knowledge on the social and environmental facets.

Meena (2013) has established four advantages of green banking – deforestation mitigation, environmental consciousness among workers and consumers, loan at lower rate distribution, and company activities transform

in an environmentally responsive way. In a few cases, societal banking will lead to lesser risk, improved climate control, and improved operating benefit (Jeucken, 2001). Bahl (2012) observed that the overall footmark lessening by green building and green banking items was assigned top priorities in green banking policies, while paperless banks and the public transit system were poor in Green Banking (Rahman et al., 2013). Bangladesh Bank is continuing its technical, creative, environmentally sustainable, and low-cost banking strategy by 2021 in order to ensure access to monetary services for everyone. Bangladesh's Green Banking Strategies have been advanced to raise the awareness of climate transformation, environmental destruction, and the immediate need for environmental defense among staff, customers, and other parties concerned (Bangladesh-Bank, 2012). A study on US bankers suggests that the banks that embrace green banking by environmental sustainability have a comparative edge over other banks, as the organization is aware of environmental concerns. These banks had an advantage over others. Ginovsky (2009) has proposed that banks should introduce green goods that are friendly and ecologically stable, encourage sustainable growth, and re-establish their bureaucratic frameworks and everyday activities.

The level at which companies are dedicated to safeguarding the environment denotes environmental efficiency. Lober (1996) noted that a variety of indicators, for example, low ecological releases, pollution control, waste reduction, and recycling, can be used to quantify environmental performance. Green accounting deals with these metrics by providing powerful and far-reaching market-based strategies. Green bank activities in banks are also helping to boost the environmental efficiency of banks by decreasing the negative effect on their environment (reduce the use of paper, decrease the electricity use and emissions of fuel) and improving the favorable impact on the atmosphere (develop the eco-friendly training and understanding for workers, create green building and solar and energy use). Since environmental issues in banks are emerging fast, they need green banking policies to save the environment and increase their profitability. They need to improve their banks' environmental performance.

Many scholars suggest that green accounting is environmental and minimizes the negative effect on the Environment (Azman, 2012; Bai, 2011; Singh & Singh, 2012). Azman (2012) stated that green banking is environmentally-conscious or environmentally friendly to save the destruction of the planets. It promotes environmentally sustainable activities and lowers carbon footprint by banking through a variety of environmentally friendly initiatives (Singh & Singh, 2012). Green accounting involves encouraging social accountability where banks assess whether it is ecologically sustainable and has potential environmental consequences before funding a project (Bai, 2011). Bhardwaj and Malhotra (2013) stated that industry becomes green, and the natural world is restored. It is also clear that green accounting is the way the banking system is run, and the social and environmental inferences of its activities are investigated (Biswas, 2011; Jha & Bhome, 2013; Mishra, 2013).

Markets concern organizational activities that award companies or businesses by taking into account their productive use of materials and their environmental protection knowledge and punishing them. In addition, the stock market holders and the consumers of these companies already know about environmental problems and stand against those sectors that do not care about the broader social climate (Goldar, 2007). The positive relationship between the green accounting sector and bank performance was established by Hart and Ahuja (1996). While the banks only used to measure financial performance, they have now begun to sum social and environmental performance. It is impossible to transform the green banking industry remarkably or introduce new things worldwide. Bangladesh has some difficulties with good governance, corporate governance, political power, populism, unsuitable funding for ICTs, which impede the efficacy of green banking and whatever other competitive program (Hossen & Anwar, 2011). Therefore, this research is planned to allow a further step in evaluating the effect of green accounting practices on bank performance. To fill this empirical knowledge gap, this research is thus conducted in Bangladesh. For this study, considering the above - mentioned literature, the hypothesis has been formulated as:

Hypothesis 1: Green accounting practices have a positive and significant impact on the bank's performance.

3. Data, Variables, and Model

3.1. Sample and Source of Variables

The data deploys in the study have been collected from many sources. Bank-level control variables were taken from Bureau van Dijk's Bank Scope database calculated as to formula, while data for return on assets (ROA), green investment (GIN), green initiatives (GNV), and green activity management (GAM) are taken from the yearly reports of the respective banks. The authors calculated the data of Tobin's Q (TQ) as to formula. Moreover, Table A1 (see appendix) is a thorough explanation of the variables used in our study.

We take the active bank accounting data from the Dhaka Stock Exchange (DSE) listed banks' financial statements over 2009-2020. We consider all the banks as the large sample sizes provide more accurate mean values and a smaller margin of error. After all, the final dataset comprises 360 annual observations of 30 (100%) banks out of 30 banks listed in DSE.

3.2. Definition of the Variables

3.2.1. Main Dependent Variables

We usage two alternate substitutions to quantity the bank performance: the ratio of annual market values over total assets of each bank, known as Tobin's Q (TQ), and the ratio of yearly values of return on assets before loan loss provisions (ROA). Higher values of these measures mean the higher performance of banks and vice versa.

3.2.2. Main Independent Variables

Three variables are employed as proxies of green accounting practices: Green Investment (GIN) is the natural logarithms of total investment in green projects by each bank. Higher green investment indicates more significant green accounting practices. Green Initiatives (GNV) are the natural logarithms of the total number of environmental initiatives performed by each bank. The greater the number of environmental initiatives, the higher the green accounting practices. Green Activity Management (GAM) is the volume of the risk management committee that manages each bank's green activities. A higher volume of green activity management indicates better green accounting practices. Since (GIN), (GNV), and (GAM) determines the green accounting practices thus, we imagine a positive association of (GIN), (GNV), and (GAM) with banks' performance.

3.2.3. Bank-level control variables

We embrace some bank-level variables to regulate the effects that can affect the banks' performance.

Bank Size (BS) equals the natural logarithm of each bank's yearly value of total assets. Djalilov and Piesse (2016) find negative results by applying system GMM but get positive results by applying the random-effects model. That means bank size may be either positive or negative. Thus, we undertake a negative association between bank size and banks' performance. Size of Operations (SO) equals the natural logarithm of the total credits of each bank. We expect a positive association between the size of operations and banks' performance. Bank Capital (BC) equals the ratio of annual stockholders' equity to total assets of each bank. This notion has been broadly used in the literature to quantify bank capital (Ashraf et al., 2015; Ashraf et al., 2016). We suppose a positive association between bank capital and banks' performance (Berger et al., 1995; Bougatef & Mgdmi, 2016; Casu et al., 2017; Naceur & Kandil, 2009).

3.3. Specification of the Model

In this research, our vibrant objective is to study the impact of green accounting practices on banks' performance; fundamentally, we postulate the following linear baseline empirical model:

$$X_{i,t} = C + \beta_1 \text{Green Accounting Practice}_{i,t} + \sum_{b=1}^B \beta_b Y_{it}^b + \epsilon_{it} \quad (1)$$

Where i and t subscripts stand for the bank and year, correspondingly. X is the dependent variable. We employ Tobin's Q (TQ) and return on assets (ROA) as dependent variables in different specifications. C is a persistent term. Y_{it} with superscripts b is the vectors of bank-level determinants, and ϵ_{it} is the random error. In-depth meanings and data foundations of the variables are offered in Table 1. A conceptual model has also been presented in fig. 1.

We employ three alternative measures of Green Accounting Practice as the primary independent variable in alternative models as follows:

$$X_{i,t} = C + \lambda GIN_{i,t} + \sum_{b=1}^B \beta_b Y_{it}^b + \epsilon_{ijt} \quad (2)$$

GIN is the natural logarithms of total investment in green projects by each bank.

$$X_{i,t} = C + \lambda GNV_{i,t} + \sum_{b=1}^B \beta_b Y_{it}^b + \epsilon_{ijt} \quad (3)$$

GNV is the natural logarithms of the total number of environmental initiatives performed by each bank.

$$X_{i,t} = C + \lambda GAM_{i,t} + \sum_{b=1}^B \beta_b Y_{it}^b + \epsilon_{ijt} \quad (4)$$

GAM measures the volume of the risk management committee that manages the green activities of each bank.

We examined the Durbin-Watson test to check the autocorrelation. The null hypothesis of the Durbin-Watson test is that the instruments employed are not autocorrelated with residuals. We accept the null hypothesis for Eq. (1) justified that the instruments are not autocorrelated with residuals.

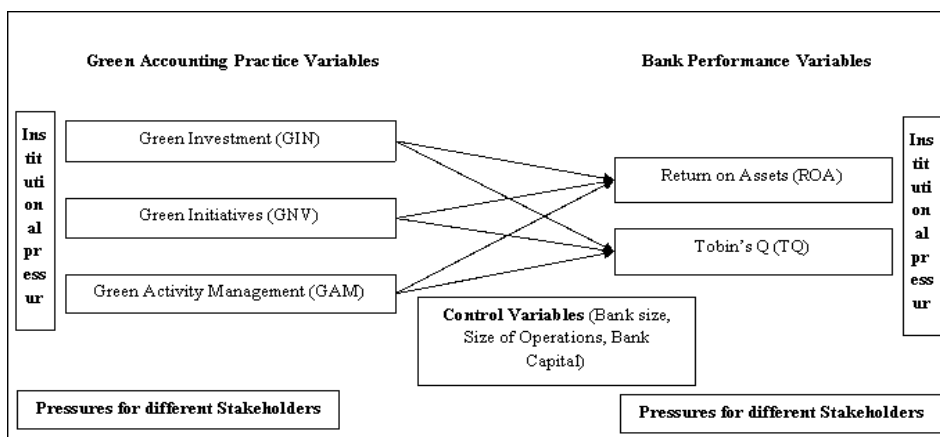


Fig. 1: Conceptual model of the study.

4. Empirical Results

4.1. Summary statistics

Summary statistics of the variables have been presented in Table 1. Regarding the performance of the bank, the overall mean of TQ, is 0.16, with a standard deviation of 0.025. In the case of ROA, the mean is 0.23, with a standard deviation of 0.038. The mean of green accounting practice proxies GIN, GNV, and GAM is 21.33, 7.24, and 5.34 with S.D. of 2.11, 3.02, and 2.23, respectively. Other variables also show multiple variants of transversely mean values.

Table 1: Descriptive statistics

	Minimum	Maximum	Mean	Std. Dev.	Observations
TQ	0.041898	1.099185	0.168343	0.025797	360
ROA	0.0112	1.34	0.235734	0.038917	360
GIN	16.34124	25.66179	21.33083	2.115099	360
GNV	1	17	7.242857	3.028539	360
GAM	3	14	5.342857	2.238567	360
SO	22.57713	27.35602	25.70282	0.820661	360
BS	23.43841	27.62898	26.19549	0.815875	360
BC	0.1906	19.7	3.42236	1.785265	360

Source: Authors' calculation

4.2. Correlation matrix

Table 2 shows the correlations amongst the variables. Correlations among the variables are not high, which guides that the issue of multicollinearity is not undermining our outcome. Gujarati et al. (2012) and Kennedy (2003) show that multicollinearity is a major problem if the correlation coefficient among independent variables is above 0.80, which is not the condition here.

Table 2: Correlation matrix

	TQ	ROA	GIN	GNV	GAM	SO	BS	BC
TQ	1.000							
ROA	0.307	1.000						
GIN	0.240	0.347	1.000					
GNV	0.288	0.251	0.206	1.000				
GAM	0.406	0.077	0.118	0.109	1.000			
SO	0.519	0.152	0.513	0.164	-0.099	1.000		
BS	0.394	0.084	0.595	0.202	-0.127	0.456	1.000	
BC	0.246	0.479	0.373	0.031	-0.197	0.218	0.128	1.000

Source: Authors' calculation

4.3. The Determinants of the Banks' Performance

To analyze the effect of green accounting practices, Eq. (1) is estimated to address all variables, which have been presented in Table 3. We drive the two-stage least square model (2SLS). The dependent variables are TQ in the model (1-3) and ROA in the model (4-6), where a higher value of them signifies the better performance of the bank and vice versa. Green accounting practice is the leading independent variable, taken by three proxies GIN, GNV, and GAM, where a larger value represents higher practices of green accounting, besides vice versa. As expected, GIN, GNV and GAM proxies of green accounting practice enter positive and statistically substantial with banks' performance (TQ) and (ROA) across all models (1 to 6).

These findings consistent with our expectations suggest that higher practice of green accounting has a considerable beneficial consequence on banks' performance in growing economies and supported by the earlier works of Ashraf et al. (2016); Azam (2016); Egbunike and Okoro (2018); Kamla and Rammal (2013); Meena (2013); Rahaman et al. (2004); Sawani et al. (2010); Singh and Singh (2012); Thevanes and Arulrajah (2016); Van Zyl (2013), and Shaumya and Arulrajah (2017). The findings approve our hypothesis and yields supportive evidence in favor of green accounting practices for banks' performance. Results of other bank-level control variables also align with our hopes. As can be understood, Bank Capital (BC) and Size of Operation (SO) comes positive and significant with banks' performance, implies that greater capital and more operations tend to contribute higher performance for the banks, steady with the previous results (Ashraf et al., 2015; Ashraf et al., 2016). Finally, Bank Size (BS) shows negative and statistically significant with banks' performance, implies that banks' performance is decreased by the larger size of each bank dependable on the previous findings (Berger et al., 1995; Bougatef & Mgadmi, 2016; Casu et al., 2017; Naceur & Kandil, 2009). Note: Dependent variable is (TQ) in the first three models and (ROA) in the next three models, where higher values of (TQ) and (ROA) signify the higher performance of banks, vice versa. The table denotes the regression results from Two-Stage Least Square (2SLS) of green accounting practices and banks' performance. Green accounting practices are captured by the three proxies, such as, Green Investment (GIN), Green Initiatives (GNV), Green Activity Management (GAM). Bank-level variables are employed as control variables. Standard errors reported in parenthesis. ***, **, * signify statistical significance at 1%, 5%, and 10% levels correspondingly. The null hypothesis of the Durbin-Watson assessment is that the instruments used are not autocorrelated with remnants. Detailed descriptions of the variables and data sources are shown in Table A1.

Table 3: Determinants of TQ and ROA (2SLS)

Variables	TQ	TQ	TQ	ROA	ROA	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.0574 (0.0474)	-0.1310** (0.0649)	-0.2959*** (0.0661)	0.1243** (0.0607)	-0.1310 (0.0827)	-0.0072 (0.1027)
GIN	0.0034** (0.0000)			0.00466* (0.0000)		
GNV		0.0230*** (0.0079)			0.0312*** (0.0101)	
GAM			0.0530*** (0.0095)			0.0129 (0.0147)
<i>Bank-Level</i>						
SO	0.0162* (0.0000)	0.0003*** (0.0000)	0.0024*** (0.0000)	0.0000* (0.0000)	0.0000 (0.0000)	0.0000* (0.0000)
BS	-0.0075* (0.0000)	-0.0000*** (0.0000)	-0.0000*** (0.0000)	-0.0000* (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
BC	0.0003 (0.0045)	0.0014* (0.0043)	0.0067* (0.0039)	0.0482*** (0.0058)	0.0496*** (0.0055)	0.0515*** (0.0060)
F-statistics	11.758***	13.924***	23.246***	22.651***	26.012***	21.080***
(P-value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
S.E. of regression	(0.202459)	(0.195057)	(0.170491)	(0.248631)	(0.25915)	(0.264547)
Adjusted R-squared	39%	43%	56%	56%	60%	54%
Durbin-Watson stat.	(0.593381)	(0.650012)	(0.650107)	(0.4596)	(0.499436)	(0.471104)

4.4. Robustness Tests: Alternative Estimation Methods

We have checked the robustness of the primary outcomes (Table 3) stated above through the alternative estimate method in Table A2 and Table A3 in the appendices. We use pooled OLS (ordinary least square) and GMM estimations in this case. Rahman et al. (2018), Lu and White (2014), and Duncan et al. (2014) also checked the robustness of their findings with alternative estimation methods.

Table A2 reports the robustness results when an alternative estimation method (pooled OLS) is used. As shown, the results remain the same. Further, Table A3 reports the robustness results when an alternative estimation method (GMM estimation) is used. As shown again, the results remain the same. Green accounting practice variables enter positively and significantly with the banks' performance in all models in both Table A2 and Table A3. We discovered neither changes in sign nor significant fluctuations in the explanatory variables' coefficient values for the banks' performance. Outcomes of bank-level variables also mostly remain the same for the determinants of performance. Altogether, these results settle the core results informed in Tables 3 steady with the concepts of Rahman et al. (2018), Lu and White (2014), and Duncan et al. (2014).

5. Conclusions, limitations, and future research scope

This study has been designed to inspect the impact of green accounting practices on all listed banks' bank performance on the Dhaka Stock Exchange in Bangladesh from 2009 to 2020. We produce robust evidence that green accounting practice has a strong positive impact on bank performance. We argue that higher investment in green projects can create more chances to optimize bank performance. Further, more green project initiatives also increase bank performance because an environmentally friendly ambiance establishes the possibility of generating more return on assets and market performance. The green activity management that is the volume of risk management committee ensures the higher practices of green practice. It implies that green activity management has a substantial impact on bank performance. We performed robustness tests with an alternative estimation method to confirm our findings.

Among the bank-level control variables, Bank Size has a negative and noteworthy impact on bank performance. In contrast, Bank Capital and Size of Operation have a positive and substantial effect on bank performance across our study.

Although this study has contributed to green accounting practices for shaping bank performance, the task is not free from limitations. First, it is precise to one setting (e.g., Bangladesh). Second, only secondary data were employed. Third, the sum of the banks is small. Future research is desirable for a significant sample for the study. Fourth, this study contemplates on banking companies only. Future researchers should consider the usage of other sectors like pharmaceuticals, power, hotels, etc. Since green

accounting practices are sparkling issues, it should be measured frequently. This study was conducted on secondary data sources; it is proposed that future research deploy mixed research to know the comparative effect of green accounting practice on banks' performance.

Appendix

Table A1: Description of the variables

Variables	Symbol	Definition	Data source
Dependent Variables			
Bank Performance	ROA	Equals the ratio of yearly values of return on assets before loan loss provisions.	Annual Reports of the Bank
	TQ	Equals the ratio of annual market values over total assets of each bank, known as Tobin's Q.	Authors' calculation
Independent Green Accounting Practice Variables			
Green Investment	GIN	Natural logarithms of total investment in green projects by each bank. Higher green investment indicates greater green accounting practices.	Annual Reports of the Bank
Green Initiatives	GNV	Natural logarithms of the total number of environmental initiatives performed by each bank. The greater the number of environmental initiatives, the higher the green accounting practices.	Annual Reports of the Bank
Green Activity Management	GAM	Measures the volume of risk management committee that manages the green activities of each bank. Higher volume of green activity management indicates better green accounting practices.	Annual Reports of the Bank
Bank-Level			
Bank size	BS	Equals natural logarithm of total assets of each bank	Bank-scope
Size of Operations	SO	Equals natural logarithm of total loans of each bank	Bank-scope
Bank Capital	BC	Equals the ratio of annual shareholders' equity to total assets of each bank	Bank-scope

Table A2: Determinants of TQ and ROA (Pooled OLS)

Variables	TQ	TQ	TQ	ROA	ROA	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.0005 (0.0004)	-0.0130* (0.0649)	-0.0959*** (0.0661)	0.0243* (0.0607)	-0.0310 (0.0827)	-0.0002** (0.1027)
GIN	0.0007** (0.0000)			0.0056*** (0.0000)		
GNV		0.0083*** (0.0045)			0.0101*** (0.0026)	
GAM			0.0411*** (0.0052)			0.0129** (0.0001)
<i>Bank-Level</i>	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	11.76*** (0.2024)	13.93*** (0.1950)	23.25*** (0.1704)	22.64*** (0.2486)	26.00*** (0.2591)	21.00*** (0.2645)
R-squared	42%	46%	59%	59%	62%	58%
Observations	360	360	360	360	360	360
No of Banks	30	30	30	30	30	30

Note: Dependent variable is (TQ) in the first three models and (ROA) in the next three models, where larger values of (TQ) and (ROA) represent the better performance of banks, vice versa. The table shows the regression results from pooled OLS (ordinary least square) of green accounting practices and banks' performance. Green accounting practices are captured by the three proxies, such as, Green Investment (GIN), Green Initiatives (GNV), Green Activity Management (GAM). Bank-level variables are employed as control variables. Standard errors are described in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels correspondingly. Detailed descriptions of the variables and data sources are denoted in Table A1.

Table A3: Determinants of TQ and ROA (Two-step system GMM estimations)

bles	TQ (GIN)	TQ (GNV)	TQ (GAM)	ROA (GIN)	ROA (GNV)	ROA (GAM)
	(1)	(2)	(3)	(4)	(5)	(6)
cept	0.042** (0.0033)	0.040** (0.0190)	0.044*** (0.0036)	0.012** (0.0120)	0.031*** (0.0003)	0.022** (0.0081)
I_{t-1}	0.460*** (0.0621)	0.443*** (0.0580)	0.496*** (0.0520)			
A_{t-1}				0.210*** (0.0033)	0.113*** (0.0190)	0.216*** (0.0036)
\bar{N}	0.0205*** (0.0001)			0.0300** (0.0000)		
\bar{IV}		0.0001** (0.0000)			0.0012** (0.0000)	
\bar{M}			0.0090*** (0.0020)			0.0021* (0.0004)
<i>Level</i>	Yes	Yes	Yes	Yes	Yes	Yes
red R- red	32%	41%	53%	50%	57%	48%
n test alue)	11.05(0.01)	10.12(0.28)	12.16(0.20)	13.35(0.03)	10.03(0.18)	11.06(0.11)
) (p- ue)	-5.21(0.00)	-4.52(0.00)	-6.02(0.00)	-6.11(0.00)	-3.12(0.00)	-4.04(0.00)
) (p- ue)	-0.77(0.33)	-1.12(0.11)	-0.19(0.56)	-0.12(0.03)	-0.02(0.01)	-0.37(0.02)
ments	6	6	6	6	6	6
ations	360	360	360	360	360	360

Note: Dependent variable is (TQ) in the first three models and (ROA) in the next three models, where larger values of (TQ) and (ROA) denotes the better performance of banks, vice versa. The table the regression output from the two-step system GMM estimation of green accounting practices and banks' performance. Green accounting practices are captured by the three proxies, such as, Green Investment (GIN), Green Initiatives (GNV), Green Activity Management (GAM). Bank-level variables are employed as control variables. Heteroskedasticity-robust t-statistics are shown in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels correspondingly. The null hypothesis of the Sargan test reports that the instruments employed are not correlated with remainders (over-identifying restrictions). Arellano–Bond order 1 (2) is tested for the first (second) order correlation, asymptotically N (0,1). In the test, the first-differenced residuals in the system GMM estimation. Detailed meanings of the variables and data collection sources are shown in Table A1.

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