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The Effect of Green Financing Drives on the Performance of DSE Listed Banks in Bangladesh

Md. Ashraful Alam[1]* and Dr. Syed Zabid Hossain[2]
[1]Associate Professor, Department of Management, OSD, DSHE, Bangladesh, Dhaka-1000.
[2] Professor, Dept. of Accounting & Information Systems, University of Rajshahi, Rajshahi.
*Correspondence: E-mail: s2313086506@ru.ac.bd , ORCID: 0009-0003-9577-0912

Abstract: All commercial banks must take green financing drives to promote environmental-friendly projects in their mainstream investment. The purpose of the study is to feed an inclusive overview of the green finance (GF) situation emphasis on bank performance in Bangladesh. The secondary data were collected from Bangladesh bank annual reports, sustainability reports, other commercial banks' reports etc. from 2014 to 2023. SPSS software was applied to interpret the data. The results of the data analysed show GF have a significant impact on bank profitability. Regression model 1 indicates that energy efficiency and the recycling and manufacturing of recycling goods have the most positive impact on bank performance. Regression model 2 identifies that renewable energy impacts the most on bank performance. The possible future essence of this study is to convince bankers and policy planners that GF can be the best solution for surviving in the competitive market and improving bank profitability.

**Keywords:** Green Finance (GF), Dhaka Stock Exchange (DSE), Sustainability, ROA, ROE.

Introduction

Bangladesh, an emerging economy, is one of the most polluted countries in the world. To protect its severely affected environment and the succeeding generation, Bangladesh must take courageous initiatives against its internal and external polluters to reduce carbon dioxide (CO_2) emissions. Alam, M. A. et al., (2024) opined among many endeavours green financing can be an instance of low carbon emissions gaining performance and save the nature.

Azad, M. A. K. et al., (2022) stated the paradigm of green financing is passing a development phase and strive to uphold its status in Bangladesh. Managing its environment requires focusing on the business fraternity, especially the banking sector. This sector must address ecological and social hazards linked with funding exercises an essential move in usual creditworthiness for loan support. Green and acceptable meddling are vital for making future

growth more lasting. Financial organizations can alter the drive of a hygienic planet to a large extent. Banks can apply a go-green strategy to inspire clients to accept hygienic know-how. This strategy expects firms to cut costs and motivate entry into new marketplaces. According to Bangladesh Bank (BB) guidelines 2011 all financial institutions are supposed to disburse the funded loan SF $\geq$ 20% in sustainable finance and GF $\geq$ 5% in green finance. BB should force all financial institutions to introduce green finance guidelines to control their ecological hazards by providing loans to eco-friendly schemes. Zheng, G-W. et al., (2021) opined that green financing can be considered as a vital financial instrument to achieve SDGs in a country. The word green has a broad sense of practice which covers the social concern of the people of the universe, where banks are treated as corporate citizens in modern society. The green finance is also known as environmental finance or green investment by banks. They also explained green finance is related with three elements consisting with environmental stability, ecological protection and long term development. Go Green strategy in banking activities usually plays a decisive part in using sustainable progress of banks and a green economy. Generally, green backing refers to lending practices that substitute eco-accountable funding and banking actions to minimize carbon and unsafe gas releases. Green financing is also called ecosystem-supportive, naturally welcoming, and ethical funding, which is used to stop environmental pollution and keep the only earth in the universe habitable. Green financing is a new concept that encourages people to earn profit and save the planet without compromising natural freshness. All banks should apply the go-green approach and persuade firms to move for environment-friendly funding and use up-to-date technology. All banks want more profit from people's deposits but this is not the end. There is a positive correlation among the stakeholder's expectations (Hossain & Rana, 2024). Stakeholders are those groups or people who can impact or be impacted by bank performance. For sustainable development, growth, and profit, banks must consider people's demand to save the planet by emitting less CO_2 into the environment as depicted in Figure 1. Ban Ki-moon the former UN secretary general mentioned "There is no plan B because there is no planet B" (Azad, M. A. K., et al., 2022). Therefore, Banks must consider people's mindset and focus on environmental preservation to earn profit. Verma (2012) and Rana & Hossain (2023) opined that it is high time to shift from the return, return, and return aim to people, profit, and planet drive. Thus, the 3P principles can be designed in the following ways.
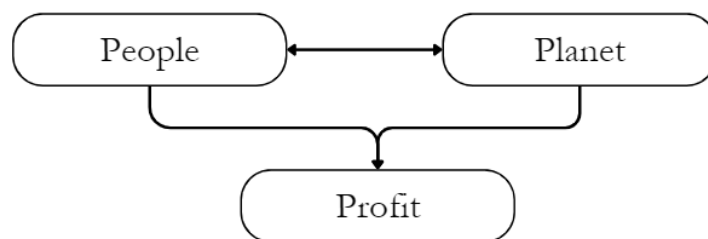
Figure 1. **Green Banking Concept**

An emerging economy demands that financial institutions should use green funding strategies where 3P concepts must be considered. It comes in many ways such as using online banking instead of large multi-branch banking, providing innovative green projects, green credit cards etc. Green banking concepts involved mainly two elements as green transformation of all internal operations of all banks and adopting environmentally responsible financing policies. Schramade (2019) mentioned three stages of sustainable finance consisting of economy, society and environment. Some studies tried to reveal the

status of green banking policy implementation, other investigations sought to find the connection between green financing and bank profitability in private commercial banks only, and some observed the factors affecting sustainability performance. Julia and Kassim (2019) differentiate banks based on Islamic Shariah from traditional banks regarding green financing performance. Akhter, I., Yasmin, S., & Faria, N. (2021) examined 30 DSE-listed commercial banks of which 90% enforced more than 60% of the GB policies (2016-2018). Still, none has attempted to depict the present situation of green financing and the effect of the selected green financing aspects on bank profitability for the period of (2014-2023). This research is inspired by Zheng, G.W. et al., (2021) to recognize the gaps as factors of green financing influencing banks' profitability in an emerging economy. The objective of this study is to examine the green finance initiatives taken by DSE listed commercial banks and find out the impact on bank performance in Bangladesh. The study also attempts to explore the contributions of green finance and sustainable finance on environment as well as performance of financial institutions.

Literature Review

Green Financing

GF is a part of investment that describes a combination of economic, societal and environmental developments with ecological balance. Based on the GF study group of the G-20, the GF provides eco-paybacks, dropping land, soil, water, and air contiminations and greenhouse gas (GHG) emissions and improving energy efficiency. GF covers private and public finance which includes effective management of credit risk, environmental risk, etc. in the financial system. Zheng, G. W. et al., (2021) mentioned four primary sources of GF: leftover managing and reprocessing, green products, green establishments, and green brick business plants. Green financing is also called green investment or climate finance is a part and parcel of green banking activities. It refers to investing in eco-friendly projects that use eco-friendly technologies such as energy efficacy, HHK, ETP, water sanitation, clean power generation, protection of biodiversity, etc. Hoshen et al., (2017). Alam, M. A. et al., (2024) identified 23 commercial banks achieved green financing target which is set by Bangladesh bank. Zhang, X. et al., (2022) defined mediating impact of green financing on green banking initiatives and environmental performance in Bangladesh. They also discovered online banking reduced carbon footprint which can assist in achieving sustainable economic development in Bangladesh. Ellahi, A. et al., (2023) attempted to find out the association of customer awareness and green banking practices in Pakistan. They identified education have a significant positive impact on green banking initiatives.

Bank Profitability

The research attempted to explore the influence of GF on bank profitability and sustainability. The popular ROA, ROE, ROI, and Tobin's Q ratios measure the bank performance. The first three are considered accounting-based indicators of performance, and the TQ ratio is a market measure of performance Park (2017); Sohel Rana, M. & Hossain, S. Z. (2023) and Saha (2019). Rashid, H. (2023) used ROA as a control variable. The ROA and ROE measures specify bank performance in any country. ROA is the best measure for examining bank performance between the two indicators. The authors in this study used ROA and ROE ratios to measure bank performance because ROA refers to return on asset and if the mean value of ROA is above 1.00 deemed an excellent performance. On the other

side ROE indicates Return on Equity and if the mean value of ROE is above 10.00 indicated a substantial value of economic performance Keffas & Olulu-Briggs (2011); Ahmed et al., 2018; Laguir et al., (2018) and Karim et al., (2000). ROI stands for return on investment which indicates financial metric. It is used in measuring profitability of an investment. ROI= (Net profit-Initial investment)/Initial investment. Tobin's Q can be calculated as (market value of equity capital + book value of debt capital)/ (book value of equity capital+ book value of debt capital). It used mainly for evaluating market performance of an organization. Alam, M. A., & Islam, T. (2023) identified the most significant factors such as level of corruption, government support and access to finance affect small and medium business in Bangladesh. Gunawan, J. et al., (2021) examined the performance and disclosures of Indonesian bank in sustainability reports. The study also developed an indicator database on sustainability research advancement regarding green banking.

Conceptual Framework

The theoritical framework describes the model that we are using in this thesis. Based on available research, a theoretical outline has been developed. The hypothesized model consisted of seven variables influencing bank profitability in Bangladesh. The investigators plan to explore the relationship between independent and dependent variables. Prior researchers used this method to measure firm performance worlwide Sampath (2015). Some researchers like Ruziqa (2013), Norman et al., (2015), and Parab & Patil (2018), used ROA, ROE, and NIM to measure firm performance. This study has used ROA and ROE as the response variables to measure bank profitability in Bangladesh.

GF Initiatives

Independent Variables (IV)
1. Renewable Energy (RE)
2. Energy Efficiency (EE)
3. Liquid Waste Management (LWM)
4. Recycling and manufacturing of recycling goods (RRG)
5. Environment-friendly Bricks Production (EFBP)
6. Green Environment-friendly Establishments (GEE)

Dependent Variables (DV)
Bank Performance
I) ROA = (Return on Asset)
II) ROE= (Return on Equity)

Control Variables
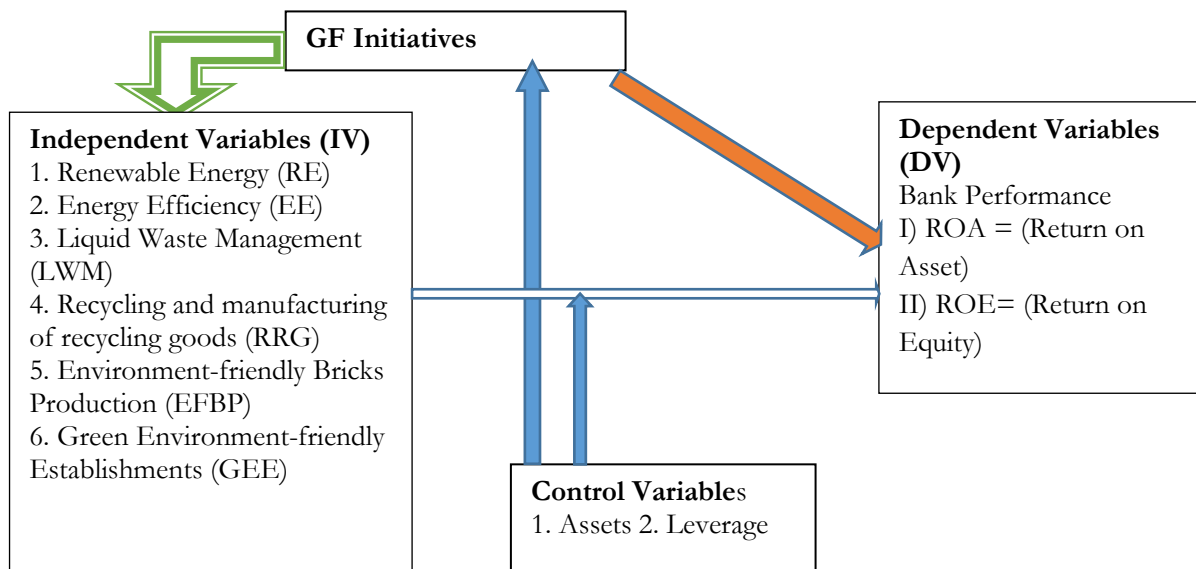1. Assets 2. Leverage

Figure 2. Conceptual Framework **(**Author's own)

The conceptual framework shown in Figure 2 embodies a resarch paradigm in this study where ROA and ROE are the dependent variables and RE, EE, LWM, RRG, EFBP, GEE are the independent variables. The study examined eleven green financing projects and finally considered the mentioned projects due to amount of investment.

Research Hypotheses
Hypotheses 1
- **H$_0$:** There is no affinity between GF and bank profitability
- **H$_a$**: There is a significant affinity between GF and bank profitability

Hypotheses 2
- **H$_0$:** There is no affinity between renewable energy and bank profitability
- **H$_a$:** There is a significant correlation between renewable energy and bank profitability

Hypotheses 3
- **H$_0$**: There is no link between energy efficiency and bank profitability
- **H$_a$**: There is a significant link between energy efficiency and bank profitability

Hypotheses 4
- **H$_0$:** Liquid waste management has no association with bank profitability
- **H$_a$:** Liquid waste management has a significant association with bank profitabilty

Hypotheses 5
- **H$_0$:** There is no association between recycling readymade garment waste and bank profitability
- **H$_a$:** There is a significant association berween recycling readymade garments waste and bank profitability

Hypotheses 6
- **H$_0$:** There is no significant connection between environment-friendly brick production and bank profitability
- **H$_a$:** There is a significant connection between environment-friendly brick production and bank profitability

Hypotheses 7
- **H$_0$:** There is no significant connection between eco-friendly establishments and bank profitability
- **H$_a$**: There is a significant association between eco-friendly establishment and bank profitability

Methods

The study used Pearson correlation analysis, similar to earlier research such as Appah et al., (2023), Akhrer, I., (2021), and Heinze (1976). Regression analysis is a popular model used by many researchers around the globe to estimate the rapport between IV and DV. According to Islam & Bari (2020), linear regression model is one of the best statistical techniques used mainly for constant response variables. Huang et al., (2017) mentioned that the regression model has some limitations when it deals with outliers in the data set. Despite its outstanding performance, it only provides the natural outcome when the data set is too big or too small compared to the standard data set. In a linear regression model, the OLS techniques is a parametric model with many conventions to be achieved before approximating the regression results. Sometimes, the expectations are not fulfilled, which can misinterpret the outcomes. The data set is not so large or small, so we used the linear reggresion model which led to more reliable and valid outcomes. However, a multiple regression model has been used to facilitate the investigation and is given in the following equatiion.

Model 1:
$$ROA = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon_i \dots\dots\dots\dots\dots\dots (1)$$

Model 2:
$$ROE = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon_i \dots\dots\dots\dots\dots\dots (2)$$

Hung et al., (2021), Yun et al., (2020), Akgun & Karatas (2020), Omenyo & Muturi (2019) in the mentioned model, ROE and ROA have been considered dependent variables, inspired by Akgun & Karatas (2020) and Yun et al., (2020). Some studies have taken Tobin's Q as the performance indicator of market (Aslam, 2019). According to Omenyo & Muturi (2019); Hosain & Saif (2019); Huang et al., (2021), the affinity between liquidity ratio and bank performance is determined by the control variables- bank size and leverage.

This study is entirely dependent on secondary sources of data. The chosen period was ten years from 2014 to 2023, and data have been gathered from 160 observations from DSE enlisted commercial banks in Bangladesh. This research collected data from reliable sources such as quarerly reports released by Bangladesh Bank, annual reports of commercial banks, sustainable reports published by Bangladesh Bank, and various research articles relating to GB and GF published from local and internationally indexed, peer-reviewed journals. This research used the SPSS software version 25 to analyze the collected data. Due to the availability of data in the annual reports of commercial banks the study considered state owned commercial banks (SOCBs) and private commercial banks (PCBs) to measure their performance. So, the research population is comprised of all 61 scheduled commercial banks operating in Bangladesh but finally we took 49 banks as a sample.

Table 1. **Determination of GF Indicators**

Variables	Abbreviation	Elaboration	Measurement	Data Source
Dependent	1. ROA	Return on Asset	Net profit/Total Asset	Keffas & Olulu-Briggs, 2011; Ahmed et al., 2018; Laguir et al., 2018, Karim et al (2000)
	2. ROE	Return on Equity	Net Profit/ Shareholder's Equity	Keffas & Olulu-Briggs, 2011; Lerskullawat & Prukumpai,2017, Karim et al (2000)
Independent	1. RE	1. Renewable Energy	GF	Islam, S. and Rana, M. (2022)
	2. EE	2. Energy Efficiency	GF	Islam, S. and Rana, M. (2022)
	3. LWM	3. Liquid Waste Management	GF	Islam, S. and Rana, M. (2022)
	4. RRG	4. Recycling and manufacturing of recycling goods	GF	Islam, S. and Rana, M. (2022)

Variables	Abbreviation	Elaboration	Measurement	Data Source
	5. EFBP	5. Environment-friendly Brick Production	GF	Islam, S. and Rana, M. (2022)
	6. GEE	6. Green Environment-friendly Establishments	GF	Islam, S. and Rana, M. (2022)
Control	1. Assets	1. Assets	Total Asset value of the bank	Keffas & Olulu-Briggs, 2011
	2. Leverage	2. Leverage	Total Liabilities/Total Shareholders' Equity	Keffas & Olulu-Briggs, 2011

Findings

Two categories of banks SOCBs and PCBs are considered, and ten years of data from 2014 to 2023 are included for four quarters in a year for this study.

Table 2. **Descriptive Statistics**

Indicators/ Variables	N	Mini	Maxi	Mean	S. D.	Skewness		Kurtosis	
							Std. Error		Std. Error
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Error	Statistic	Error
RE	80	.00	2388.14	307.7504	474.71649	2.180	.269	5.229	.532
EE	80	.00	80238.98	3018.2716	11013.57817	5.925	.269	37.120	.532
LWM	80	.00	14019.20	1428.5026	2818.50850	3.082	.269	9.519	.532
RRG	80	.00	5163.31	857.5337	1149.30005	1.543	.269	2.051	.532
EFBP	80	.00	8270.83	850.4791	1374.53408	2.995	.269	11.508	.532
GEE	80	.00	11913.76	2343.3135	3760.76425	1.414	.269	.432	.532
ROA	80	-1.30	1.03	.2867	.57851	-1.006	.269	.509	.532
ROE	80	-29.60	12.00	1.2651	12.06841	-1.438	.269	1.031	.532

Tabel 2 presents the descriptive statistics of the data with the GF variables to give the readers a general idea. Suppose the mean value of ROA is above 1.00, deemed an excellent parameter of firm performance. Contrarily, the average value of ROE above 10 indicates a substantial value of economic performance. Table 10 shows the average profitability on total assets is .2867, ranging from -1.30 to 1.03. The ROE mean of 1.2651 percent specifies that the bank earned a 1.26% return, but it varies over time with a high margin of 12.06841. The result showed that RE, EE, LWM, RRG, EFBP, and GEE grew minimum statistic to maximum statistic from Tk.00 million to Tk. 2388, 80238, 14019, 5163, 8270, 11913 million with an average worth of Tk. 307, 3018, 1428, 857, 850, 2343 million correspondingly. In the same way, ROA and ROE rise from lowest to maximum statistics from -1.30 to 1.03 and -29.60 to 12 with average values of .2867 and 1.2651, respectively. The result exhibited that all the independent variables have encouraging growth, as directed by the minimum, maximum, average, and SD values.

Table 3. **Correlations Matrix (SOCBs and PCBs)**

Indicators/ Variables		ROA	ROE	Re	Ee	Lwm	Rrg	Efbp	Gee
ROA	Pearson Correlation	1	.841**	.403**	.213	.369**	.469**	.398**	.286*
	Sig. (2-tailed)		.000	.000	.058	.001	.000	.000	.010
	N	80	80	80	80	80	80	80	80
ROE	Pearson Correlation	.841**	1	.402**	.194	.365**	.439**	.387**	.340**
	Sig. (2-tailed)	.000		.000	.084	.001	.000	.000	.002
	N	80	80	80	80	80	80	80	80
Re	Pearson Correlation	.403**	.402**	1	.021	.472**	.469**	.271*	.438**
	Sig. (2-tailed)	.000	.000		.855	.000	.000	.015	.000
	N	80	80	80	80	80	80	80	80
Ee	Pearson Correlation	.213	.194	.021	1	-.016	.017	.072	.091
	Sig. (2-tailed)	.058	.084	.855		.885	.883	.525	.424
	N	80	80	80	80	80	80	80	80
Lwm	Pearson Correlation	.369**	.365**	.472**	-.016	1	.409**	.562**	.351**
	Sig. (2-tailed)	.001	.001	.000	.885		.000	.000	.001
	N	80	80	80	80	80	80	80	80
Rrg	Pearson Correlation	.469**	.439**	.469**	.017	.409**	1	.561**	.600**
	Sig. (2-tailed)	.000	.000	.000	.883	.000		.000	.000
	N	80	80	80	80	80	80	80	80
Efbp	Pearson Correlation	.398**	.387**	.271*	.072	.562**	.561**	1	.222*
	Sig. (2-tailed)	.000	.000	.015	.525	.000	.000		.048
	N	80	80	80	80	80	80	80	80
Gee	Pearson Correlation	.286*	.340**	.438**	.091	.351**	.600**	.222*	1
	Sig. (2-tailed)	.010	.002	.000	.424	.001	.000	.048	
	N	80	80	80	80	80	80	80	80

** Correlation is significant at the 0.01 level (2-tailed).

Pearson correlation findings is used to investigate the relationship between IV and DV. According to Appah (2020), this relationship is assumed to be linear, and the correlation coefficient ranges from -1.00 to +1.00, which means a perfect negative correlation to a perfect positive correlation. According to Kothari (2013), the correlation coefficient determines the strength of the relationship between IV and DV. Table 13 indicates how the variables are correlated with each other. The correlation values are less than one, meaning the variables set have no multi-collinearity problem.

The result in Table 3 (all banks) revealed a Pearson correlation coefficient (Rho) of R-value .403**, which illustrated a limited positive relationship between banks' Renewable Energy (RE) of GF in Bangladesh and R-Value .213, which illustrated a limited positive relationship between banks' Energy Efficiency (EE) for green funding.
R-Value .369** illustrated a limited positive relationship between banks' Liquid Waste Management (LWM) and GF. R-Value .469** illustrated a limited positive relationship between banks' Recycling and manufacturing of Recycling Goods (RRG) of GF. R-value

.398** illustrated a limited positive relationship between banks' environmentally friendly Brick Production (EFBP), which means Hybrid Hoffman Kiln (HHK) of GF. R-value .286* illustrated a limited positive relationship between banks' Green Environmentally Friendly Establishments (GEE) for green funding.

Table 4. **Regression Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.578a	.334	.279	.49115	.334	6.100	6	73	.000	.897

a. Predictors: (Constant), gee, ee, efbp, re, lwm, rrg

b. Dependent Variable: ROA

Source: SPSS version 25 output

In table 4, the Regression coefficient of R=578 or 57.8% indicates the relationship between IV and DV exists. The coefficient of determination R2=.334, which showed a 33.4% variation in GF and sources Return on Asset (ROA), is explained by gee, ee. efbp, re, lwm, rrg. This implies a positive relationship between banks' predictors (constant) gee, ee, efbp, re, lwm, rrg, and roa. The Durbin-Watson d=.897 indicates the presence of positive autocorrelation in the data, and it shows the model has the goodness of fitness.

Table 5. **Anova (Hypotheses Testing 1)**

Model: 1	Sum of Squares	Df	Mean Square	F	Sig.
Regression	8.830	6	1.472	6.100	.000b
Residual	17.610	73	.241		
Total	26.440	79			

- Predictors: (Constant), gee, ee, efbp, re, lwm, rrg

Table 5 F-test shows a regression significant P value of .000< 0.05 alpha level, F-Value 6.1000, which illustrated that the overall model is statistically significant at 0.05 alpha level between banks IV (gee, ee, efbp, re, lwm, org) and DV (roa). So, it is inevitable that the null hypotheses is rejected. It can be concluded that the independent variables significantly impact the bank's profitability. Hence, GF has a significant impact on bank profitability.

Table 6. **Coefficients**a

Model: 1	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	T	P-value
(Constant)	-.001	.074		-.011	.992
Re	.000	.000	.203	1.714	.091
Ee	1.072E-5	.000	.204	2.105	.039
Lwm	2.354E-5	.000	.115	.890	.377
Rrg	.000	.000	.304	2.051	.044
Efbp	4.583E-5	.000	.109	.803	.424
Gee	-1.049E-5	.000	-.068	-.534	.595

Model 1:

ROA = $\beta_0 + \beta_1$RE+ β_2EE+ β_3LWM+ β_4RRG+ β_5EFB+ β_6GEE+ €i

= -.001+.203RE+ .204EE+ .115LWM+ .304RRG+ .109EFB - .068GEE

According to the linear equation mentioned above, there is a varied relative association between DV and IV. The model shows that if there is no financing in the six independent sectors by any bank and no branches, they can expect a profit from Tk. -.001. Here, Recycling and manufacturing of Recycling Goods (RRG) has the most impact on banks' profitability with a beta of .304. It is followed by .204EE, .203RE, .115 LWM, .109 EFB, and - .068 GEE, respectively. So, the beta value shows that banks' profitability can be enhanced by maximizing GF for recycling and manufacturing recycling goods.

Table 6 indicated that the beta value of .203 and P-Value .091 is greater than the .05 significant level between RE and ROA. Therefore, we accept the null hypothesis that there is no relationship between renewable energy and the Bank's profitability. However, at a 10% significant level, we can reject the null hypothesis. If all other variables are constant, a 1-unit change in RE will cause a change of .203 units in ROA. So, there is a positive relationship between RE and ROA. The result is similar to Akgun and Karatas (2020) and Durrah et al. (2016).

Table 6 indicated that the beta value of .204 and P-value of .039 is less than the .05 significant level between EE and ROA. Therefore, we reject the null hypothesis that an essential relationship exists between energy efficiency and the Bank's profitability. If all other variables are constant, 1 unit change in EE will cause a change of .204 units in ROA. So, there is a positive relationship between EE and ROA. The result is similar to Akgun and Karatas (2020).

Table 6 indicated that the beta value of .115 and P-Value .377 exceeds the .05 significant level between LWM and ROA. Therefore, we accept the null hypothesis that Liquid Waste Management has no relationship with the Bank's profitability. If all other variables are constant, 1 unit change in LWM will cause a change of .203 units in ROA. So, there is a positive relationship between LWM and ROA. The result is similar to Akgun and Karatas (2020).

Table 6 indicated that the beta value of .304 and P-value of .044 is less than the .05 significant level between RRG and ROA. Therefore, we reject the null hypothesis that a substantial relationship exists between Recycling and manufacturing of Recycling Goods and the Bank's profitability. If all other variables are constant, a 1-unit change in RRG will cause a change of .304 units in ROA. So, there is a positive relationship between RRG and ROA. The result is similar to Akgun and Karatas (2020).

Table 6 indicated that the beta value of .109 and P-value of .424 are greater than the .05 significant level between EFBP and ROA. Therefore, we accept the null hypothesis that there is no relationship between Environmentally Friendly Brick Production and the Bank's profitability. If all other variables are constant, a 1-unit change in EFBP will cause a change of .109 units in ROA. So, there is a positive relationship between EFBP and ROA. The result is similar to Akgun and Karatas (2020).

Table 6 indicated that the beta value of -.068 and P-value of .595 is greater than the .05 significant level between GEE and ROA. Therefore, we accept the null hypothesis, and there is a negative relationship between Green Environment-friendly Establishments (GEE) and the Bank's profitability.

Table 7. **Regression Model Summary**[b]

| Model | R | R Square | Adjusted R Square | Std. Error | Change Statistics | | | | | Durbin-Watson |
					R Square Change	F Change	df1	df2	Sig. F Change	
2	.554[a]	.307	.250	10.44910	.307	5.397	6	73	.000	1.172

The impact of GF on bank profitability was assessed using regression analysis. Return on Equity (ROE) was the dependent variable, while independent variables included gee, ee, efbp, re, lwm, and rrg. Table 17 shows a regression coefficient of R=.554 or 55.4%, indicating a relationship between the independent and dependent variables. The coefficient of determination R^2=.250 demonstrates that 25.0% of the variation in GF and the return on equity (ROE) is explained by gee, ee, efbp, re, lwm, and rrg, suggesting a positive relationship between these predictors and return on assets (ROA). The Durbin-Watson value of d=1.172 indicates the presence of positive autocorrelation in the data, signifying that the model fits well. The Durbin-Watson statistic examines autocorrelation in the regression model's output. Values of the DW statistic range from 0 to 4, with a value of 2.0 indicating zero autocorrelation. Values below 2.0 indicate positive autocorrelation, while values above 2.0 indicate negative autocorrelation.

Table 8. **ANOVA**[a] **Hypothesis Testing 1 (Test Result of F count)**

Model: 2	Sum of Squares	Df	Mean Square	F	Sig.
Regression	3535.680	6	589.280	5.397	.000[b]
Residual	7970.402	73	109.184		
Total	11506.083	79			

The F-test result in Table 8 shows that Pvalue 0.000, which is lower than a 5 percent significance level, so it is evident that the null hypotheses is unacceptable. There is a subtantial association between ROE, and IV (gee, ee, efbp, re, lwm, rrg). It can be concluded that GF significantly impacts banks profitability.

Table 9. **Coefficients**[a]

Model: 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-4.677	1.578		-2.964	.004
RE	.005	.003	.202	1.677	.098
EE	.000	.000	.172	1.739	.086
LWM	.000	.001	.090	.684	.496
RRG	.002	.002	.181	1.199	.234
EFBP	.001	.001	.154	1.114	.269
GEE	.000	.000	.061	.469	.641

The coefficient outcome disclosed that green finance (GF) initiatives positively impact on bank performance. The more the GF, the more the profitability.

Model 2:
ROE = $\beta_0 + \beta_1 RE + \beta_2 EE + \beta_3 LWM + \beta_4 RRG + \beta_5 EFBP + \beta_6 GEE + \epsilon_i$
   = -4.677+ .202 RE+ .172 EE+ .090 LWM+ .181 RRG+ .154 EFB+ .061 GEE

According to the linear equation mentioned above, there is a varied relative association between DV and IV. Here, Renewable energy (RE) has the most impact on banks profitability, with a beta of .202, followed by .181 RRG, .154 EFB, .172 EE, .090 LWM and .061 GEE separately. So, the beta value shows that banks profitability can be enchanced by maximizing GF for renewable energy.

Table 9 show that the beta of .202 and the P-value of .098 are larger that the .05 significant level between RE and ROE. Therefore, the study accepts the null hypotheses because there is no connection between renewable energy and bank profitability. However, the null hypotheses is rejected with a 10% significance level. If all other variables are constant, a 1-unit alteration in RE would lead to an alteration of .202 units in ROA. So, there is a positive connection between RE and ROE. The results is similar to Hermanto et al., (2018).

Table 9 indicated that the beta of .172 and P-value of .086 are greater than the .05 significant level between EE and ROA. Thus, the null hypothesis is accepted as we found no substantial affinity between energy efficiency and Bank profitability. However, with a 10% significance level, the null hypothesis is rejected. If all other variables are constant, a 1-unit variation in EE would lead to a change of .172 units in ROE. So, there is a positive association between EE and ROE. The result is similar to Hermanto et al., (2018).

Table 9 indicated that the beta of .090 and P-value of .496 are greater than the .05 significant level between LWM and ROE. Therefore, we accept the null hypothesis that Liquid Waste Management has no relationship with the Bank's profitability. If all other variables are constant, a 1-unit alteration in LWM would lead to an alteration of .090 units in ROE. So, there is a positive affiliation between LWM and ROE.

Table 9 showed that the beta of .181 and P-value of .234 are larger than the .05 significant level between RRG and ROE. Therefore, the study agrees to take the null hypothesis because there is no substantial association between recycling and manufacturing recycling goods and the Bank's profitability. If we keep all other variables constant, a 1-unit variation in RRG will change .181 units in ROE. So, there is a positive affinity between RRG and ROE.

Table 9 showed that the beta of .154 and P-value of .269 are larger than the .05 significant level between EFB production and ROE. Thus, this study takes the null hypothesis because there is an insignificant association between Environment-friendly Brick Production and Bank profitability. If all other variables remain constant, a 1-unit alteration in EFB production will cause an alteration of .154 units in ROE. So, there is a positive connection between EFB Production and ROE.

Table 9 showed that the beta of .061 and P-value of .641 are larger than the .05 significant level between GEE and ROA. Thus, this study accepts the null hypothesis because there is no connection between Green Environment-friendly Establishments (GEE) and Bank

profitability. If all remaining variables are constant, a 1unit variation in GEE can alter .202 units in ROE. So, there is a positive correlation between GEE and ROE. The result is similar to Hermanto et al., (2018).

Table 10. **Hypotheses Summary Model 1**

GF Indicators	Null Hypothesis (Ho)	Alternative Hypothesis (Ha)	Sig. P-value	Decisions
1. Renewable Energy	No impact on profitability	Significant impact	0.091 or 9.1% > 5%	Ho is accepted
2. Energy Efficiency	No impact on profitability	Significant impact	.039 or 3.9% <5%	Ho is rejected
3. Liquid waste Management	No impact on profitability	Significant impact	.377 or 37.7% >5%	Ho accepted
4. Recycling and manufacturing of Recycling Goods	No impact on profitability	Significant impact	.044 or 4.4% <5%	Ho rejected
5. Environmentally Friendly Brick Kiln Production	No impact on profitability	Significant impact	.424 or 42.4% >5%	Ho accepted
6. Green Environmentally Friendly Establishments	No impact on profitability	Significant impact	.595 or 59.5% >5%	Ho accepted

Table 11. **Hypotheses Summary Model 2**

GF Indicators	Null Hypothesis (Ho)	Alternative Hypothesis (Ha)	Sig. P-value	Decisions
1. Renewable Energy	No impact on profitability	Significant impact	0.098 or 9.8%< 10%	Ho is rejected
2. Energy Efficiency	No impact on profitability	Significant impact	.086 or 8.6%<10%	Ho is rejected
3. Liquid waste Management	No impact on profitability	Significant impact	.496 or 49.6% >10%	Ho accepted
4. Recycling and manufacturing of Recycling Goods	No impact on profitability	Significant impact	.234 or 23.4% >10%	Ho accepted
5. Environment-Friendly Brick Kiln Production	No impact on profitability	Significant impact	.269or 26.9%>10%	Ho accepted
6. Green Environment Friendly Establishments	No impact on profitability	Significant impact	.641 or 64.1%>10%	Ho accepted

Conclusion

In 2011, Bangladesh Bank launched formal actions toward greening financial activities and issued several circulars, guidelines, and policies as a controlling authority of the banking sectors. This research studied the position of green finance and its influence on bank performance in terms of ROA and ROE. The study depicts the data of green finance invested by commercial banks from 2014 to 2023. In Model 1 energy efficiency (EE) and recycling and manufacturing of recycling goods (RRG) indicate the most impact on bank performance. Model 2 recommends that renewable energy (RE) has the most impact on bank performance. The study also proved higher green finance practices through EE, RE, RRG, and LWM projects provide better financial performance for banks in Bangladesh. To assess the green finance status by banks and its effect on performance only secondary data were obtained

from sustainable finance department of Bangladesh bank. To test the hypotheses among the dependent and independent variables ANOVA was used. Next, descriptive statistics, correlation and regression analysis etc. were employed for clarification. After an in-depth investigation, it became clear that green finance significantly and positively impacts bank profitability (hypothesis 1). The study also showed a win-win situation between banks and clients that leads ultimately the planet will be green, sustainable, and inhabitable for each creature. This findings of the study would benefit the top administration of financial institutions, policymakers, and regulatory authorities in making the right decisions in right time regarding green financing. The study observed that unfortunately all banks are not aware of green financing concepts and did not disclose the activities as per Bangladesh bank guidelines. Based on the entity philosophy, all financial institutions are global residents and as such, they must accept that every minor green step can build a greener future and make the planet green and inhabitable for all creatures. Banking sectors are considered corporate citizens in the modern state concept. As a financial sector, they continually try to work with Bangladesh Bank's GB guidelines to make themselves more responsible for the environment, greener planet and society at large. As per prior research green financing helps to reduce operating costs and increase profitability of financial institutions. Banking sectors should realize that as a corporate citizen, they can play an influential role in eco-friendly development and economic growth. As per the present research findings, all commercial bank should allocate their green funds on priority basis to the energy efficiency, recycling and manufacturing of recycling goods, renewable energy, environmentally friendly Brick Production, Liquid Waste Management and Green Environment-friendly Establishments respectively.

Implications

A very few research have been done regarding green financing status and its impact on bank performance in Bangladesh. The present study offers a variety of theoretical and practical implications in the light of green financing adoptions and its effect on banks' environmental and sustainable performance. At first, this study depicts the present scenario of green financing initiatives taken by DSE listed commercial banks from 2014-2023 period. Second, six green financing projects were examined and ranking based on collected data. Third, the study fills the gap regarding green financing perspective bank performance and provide some insights for academics, scholars, bankers, policy planners, government investors etc. in Bangladesh. Lastly, the study developed a green finance model can be helpful in making right decision in developing countries like India, Pakistan, Srilanka, Nepal even in China. This study also revealed the relationships between sector-wise green financing initiatives and bank performance by which any one can take the correct decisions regarding green investment. The findings may be used in future valuation of commercial banks regarding green financing adoption and financial performance in Bangladesh. Finally, the central bank of Bangladesh should formulate a robust green financing framework which is compulsory to be implemented by financial institutions and contribute to the sustainable and environmental performance.

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