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Corporate Social Responsibility, Green Finance and Environmental Performance: Does Green Innovation Matter?

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Abstract: This study aims to examine the impact of Corporate Social Responsibility (CSR) and Green Finance (GI) on the Environmental Performance (EP) of banking institutions in emerging markets like Bangladesh. The study also examines the role of green innovation (GI) as a mediator in the existent relationship between CSR, GF and EP. Data were obtained from 357 bankers of commercial banks in Bangladesh through the aid of structured questionnaires. A structural equation modeling approach was employed in the investigation of the obtained primary data, and results revealed that CSR had a significant positive impact on GI and EP, while GI strongly enhances EP. Besides, the findings revealed that GF had a significant positive influence on GI and EP. Furthermore, the research data indicated that GI fully mediates the link between CSR and EP, and GF and EP significantly. The study highlights the importance of CSR dimensions (social, economic and environmental), GF and GI in the attainment of EP, as well as the urgent need to incorporate sustainability into banking strategies to help achieve the country's long-term economic development. As a result, major policy implications were further addressed.

Keywords: CSR; green finance; green innovation; environmental performance; legitimacy theory; banking institutions

1. Introduction

With the emergence of climate change and its consequences on a global scale, professionals, researchers, and businesses have now recognized the detrimental effects of human activities such as air pollution, water contamination, indiscriminate utilization of resources, and the use of hazardous materials on the environment [1,2]. According to Ma et al. [3], the year 2018 has been considered the warmest year ever due to the aforementioned environmental challenges, and as a result, it has become imperative for organizations to focus on environmental as well as nature preservation activities [4,5]. In recent years, prompt attention to 'green' issues has been regarded as a great catalyst for industrial professionals and academics [4,6], and due to the competitive business climate, global business owners have now evolved eco-sustainable solutions to gain a competitive edge. In order to attain organizational environmental sustainability and fight against climate change, banking institutions play a crucial role both in developed and developing countries [7]. Therefore, it is crucial to explore how banking institutions can further enhance their organizational environmental sustainability.

Concerns about economic progress, environmental sustainability and social cohesiveness are not new, but merging these factors primarily into one research is becoming increasingly important by the day [8]. In addition, the role of CSR is crucial to doing business in such an improved way that takes environmental, social and economic issues

into account [4,8]. Green finance (GF), on the other hand, is a modern economic event that combines economic and social benefits with ecological progress [9]. Likewise, GF represents a new driver of economic growth and an accelerator for long-term economic development that emphasizes the importance of social responsibility and environmental preservation [10]. Furthermore, green innovation (GI) is regarded as a key factor in the determination of sustainability performance [11], environmental performance [4], and firm performance [12]. Environmental performance (EP) is a part of environmental sustainability effectiveness that pertains to the ecological operations and products of the organization [13]. As a result, it can be inferred that CSR, GF and GI collectively play a significant role in ensuring the sustainability of companies and a country's long-term economic development. This study investigates how CSR, GF, and GI influence the EP of banking institutions in an emerging economy. This study attempts to address the following two research questions: (RQ1) Is there a link between CSR, GF and EP in the banking sector of an emerging economy? (RQ2) To what extent can GI mediate the link between CSR and EP, GF and EP?

In order to examine the relationships among the study variables, this study develops and tests a conceptual model by utilizing the data from the banking institutions of an emerging economy such as Bangladesh. Developing countries like Bangladesh are struggling with climate change and its effects on the environment [14]. To tackle these challenges and support long-term development, they have implemented a number of measures, such as green finance, the use of eco-friendly technologies, and the incorporation of corporate social responsibilities into their daily operations [15,16]. Furthermore, the literature has suggested that CSR, GF, and innovation are more prevalent in developed country contexts, but emerging economies like Bangladesh should also emphasize this as their economy is growing [1,4,15]. As a result, the current research focuses on the determinants of EP in banking firms in an emerging economy like Bangladesh.

Previous studies have focused on the effects of CSR on firm performance [3,17–26], environmental performance [4,27–31], and sustainability performance [28,32–36]. However, little attention has been paid to investigating the impact of CSR on EP [4] in the context of banking institutions, and the results of the existing studies have been largely inconclusive [4,16,21]. Furthermore, works of literature have confirmed that GF has a substantial impact on sustainability performance [5,34], EP [2,37], and financial performance [34]. Despite the fact that several studies have discovered a link between CSR and sustainable and environmental performance, experts continue to focus on this relationship due to inconsistent findings. As a result, the current study proposed and tested a comprehensive research model based on the legitimacy theory and incorporated the concept of GF to investigate the relationship between CSR, GF, and EP in the banking industry with the help of the mediating variable GI.

The present study makes several contributions and ramifications for professionals, researchers, and legislators by providing a variety of theoretical foundations based on empirical data on CSR, GF, GI, and EP in the banking industry of an emerging economy. The current study plays a pioneering role in developing a research framework based on legitimacy theory to encompass CSR, GF, GI and EP. Previous researchers utilized the stakeholder, natural RBV, ability motivation–opportunity, and contingency theories for CSR, GI, and EP in various organizations such as large manufacturing firms and SMEs. As an instance, the influence of CSR on the economic performance of SMEs from the viewpoint of the stakeholder theory was studied by [8]. In addition, Rötzel et al. [38] assessed the association between environmental strategy and environmental managerial performance using the contingency theory. The association between the GI and EP of SMEs via the ability motivation-opportunity theory was examined by Singh et al. [39], while the relationship between CSR, GI, environmental strategy, and EP of large manufacturing firms was assessed by Kraus et al. [4] via the natural RBV theory. The present study developed a comprehensive research model based on the legitimacy theory that incorporates the concept of green finance to examine the relationship between CSR, GF, GI and EP in the context of

the banking industry of emerging economies such as Bangladesh. Meanwhile, managers can now employ CSR, GF and GI to improve the EP of banking organizations.

The subsequent section presents an extensive literature review, hypothesis development, and theoretical framework. Section 3 contains the details of the research methods, including the sample and survey employed in the collection of appropriate data for the assessment of the estimated research model, while Section 4 provides the findings of the model's testing. Discussions and conclusions are presented in the last section.

2. Literature Review and Hypothesis Development

2.1. Theoretical Background

According to the legitimacy theory, society's consent is critical to promoting the sustainability of an institution. legitimacy theory asserts that "businesses actively seek legitimacy and keep it by combining corporate values, initiatives, and strategies with community values to make an organization more environmentally sustainable" [40]. As a result, businesses must choose activities that are highly congruent with societal perspectives, beliefs, and norms. Furthermore, based on the legitimacy theory, CSR can be understood as initiatives that organizations adopt to enhance their overall performance and sustainability while also benefiting society and the environment [16]. CSR can be defined as the strategies that businesses use to ensure that they are operating in an ethical, socially responsible, and developmentally beneficial manner to the community [41]. According to the concept of legitimacy theory, GF can be seen as an organization's strategy to gain and keep legitimacy [42], since it helps companies manage the environmental effects of their operations by reducing energy use, carbon emissions, and other negative effects [2,43]. Moreover, GI is defined as an organization's innovative initiatives that include green banking, internet banking, remote deposit, and paper reduction aimed at improving overall environmental sustainability [4]. As a result, in accordance with the legitimacy idea, businesses should use CSR activities (e.g., social, economic, and environmental), GF, and GI initiatives to gain, keep, or regain their legitimacy, which helps them to attain overall environmental sustainability. Therefore, based on the concept of legitimacy theory, this study developed a research framework to evaluate the relationship between CSR, GF, GI and EP in the banking industry of an emerging economy. The conceptual framework for the study is shown in Figure 1.
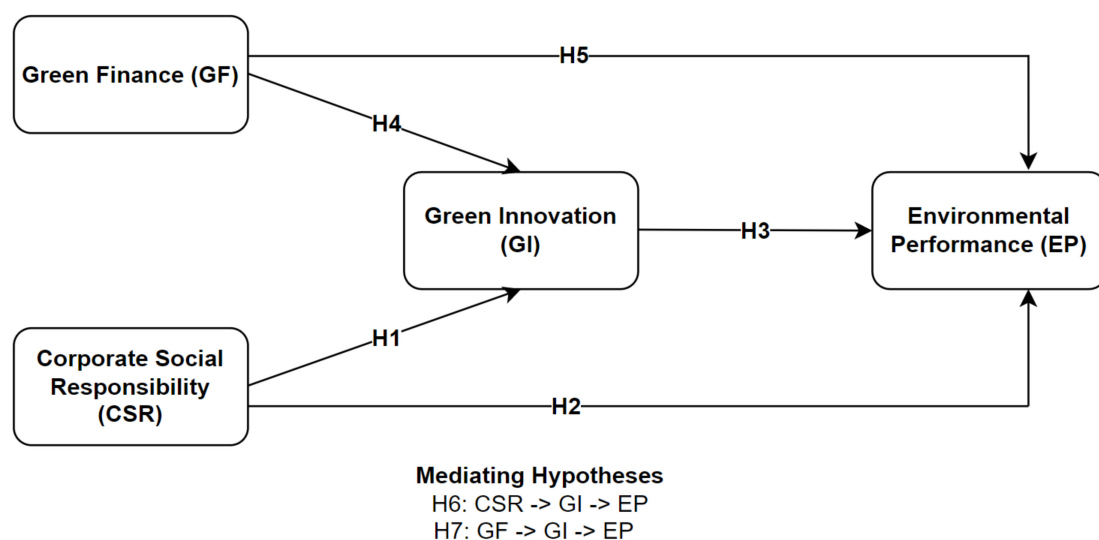

Figure 1. Theoretical Model.

2.2. CSR, Green Innovation and Environmental Performance

According to a review of the literature, while some studies have highlighted the link between CSR and financial performance, very few have investigated the connection

between CSR and EP [27]. More recently, Ahmad, Ullah, et al. [44] discovered that CSR activities significantly improve the EP, and that CSR activities may help reduce environmental footprints by encouraging the pro-environmental behavior of employees in Pakistani organizations. In another study, Suganthi (2020) observed that CSR has a significant positive impact on environmental, cost and market performance. In addition, there is a significant correlation between economic and social performance, as well as between economic and environmental performance, according to an investigation by Sidhoum and Serra [45] on the relationship between CSR and several performance metrics across US power utilities. These findings suggest that environmentally friendly innovations will promote economic well-being and assist in the development of a healthier environmental system, thereby resulting in improved economic outcomes. Therefore, GI is defined in this study as technological advancements such as green technology, green banking, online banking, and online customer service that assist banking institutions in improving their overall environmental sustainability. Furthermore, Kraus et al. [4] discovered that CSR has a significant positive impact on GI, and that GI mediates the relationship between CSR and EP. Similarly, Al-shuaibi [19] stated that CSR significantly enhances innovation, while Suganthi [46] discovered that CSR activities had a considerably positive impact on the adoption of green practices in India. According to the study, the fusion of CSR activities into a business is a strategic step to ensure sustainable performance. As a result, it is possible to conclude that CSR policies considerably improve an organization's GI and EP, and the following hypotheses were subsequently proposed:

H1. *CSR significantly enhances the GI of banking institutions.*

H2. *CSR significantly enhances the EP of banking institutions.*

2.3. Green Finance, Green Innovation and Environmental Performance

GI refers to technological advancements that reduce waste, climate change, water use, air pollution, carbon emissions, and the combustion of coal, oil and power, while also conserving energy [4]. On the other hand, climate change is a major challenge encountered in todays' world [1,47], and to mitigate its negative effects, GI is critical [4]. The GI is closely related to an organization's environmental management strategy and significantly enhances EP [48]. Furthermore, GI reduces the negative impact of a company's activities on its environment while also improving organizational social and financial performance via the reduction of cost and emission of waste [49]. GI has a significant positive impact on overall organizational performance—including the EP—as indicated by H. Wang et al. (2021) [50]. Moreover, Kraus et al. [4] discovered that the GI significantly influenced the EP of manufacturing firms, while Edeh et al. [51] indicated that a new technological innovation enhances export performance. According to Ferreira et al. [52], technology innovation transfers frequently have a negative impact on the environment. Researchers also perceived CSR as having an impact on the EP of large manufacturing enterprises, with GI acting as a mediator [4]. However, the studies cited above are unable to assess the extent to which GI predicts environmental performance. GI, on the other hand, has a considerable impact on EP, while green managerial innovation has no impact, as evidenced by the findings of Chiou et al. [53]. More recently, the literature has confirmed that GF significantly enhances corporate technological innovation [54]. Consequently, GI can be demonstrated in this study as banks' technical innovations comprising green banking, internet banking, remote deposit and paper reduction geared towards the enhancement of overall environmental sustainability. The link between GI and environmental performance is still ambiguous [4], and further research in the context of banking institutions is required. Furthermore, a paucity of empirical research on the impact of GF on GI exists. Previous studies have revealed a link between CSR, GI and EP [4], but none have examined the effects of GF on GI. The goal of our research is to bridge this gap, and hence, the following research hypotheses were developed:

H3. *GI significantly impacts the EP of banking institutions.*

H4. *GF has a significant positive impact on the GI of banking institutions.*

2.4. Green Finance and Environmental Performance

According to Sinha et al. [31], GF mechanisms may demonstrate a progressive detrimental influence on environmental and social responsibility. Besides, GF and CSR are forms of corporate accountability to stakeholders (the public, shareholders, investors, customers, and other groups) that assist organizations in the achievement of financial and sustainable successes while avoiding legitimacy gaps or social and environmental conflicts [34]. According to Indriastuti and Chariri [34], green finance may enhance the corporate sustainability of organizations via the financing of numerous eco-friendly projects, which will significantly result in EP [2]. Wahba and Elsayed [55], on the other hand, stated that investments in CSR have the potential to significantly contribute to the improvement of society and businesses, consequently improving the company's financial and sustainability performance [34,56] and EP [4,27]. Researchers have recently demonstrated that GF significantly improves the EP of banking institutions [2,37]. Therefore, it can be concluded that investing in various eco-friendly projects may improve the organizations' corporate accountability and EP. The following research hypothesis is thus formulated:

H5. *GF has a significant positive impact on the EP of banking institutions.*

2.5. The Mediating Role of GI

The previous explanations on the relationship between CSR, GI and EP highlight that CSR influences GI, which subsequently results in the improvement of an organization's EP. Works of literature have confirmed that GI positively influences EP [4,50,57]. Furthermore, research has also demonstrated that CSR significantly improves organizational performance [58,59], cost and market performance [27], and sustainable financial performance [56]. More recently, Kraus et al. [4] discovered that environmental strategy and GI significantly mediate the relationship between the CSR and EP of large manufacturing firms in Malaysia. The study also claimed that the relationship between CSR and organizational performance is uncertain and should be further studied via the incorporation of a mediating variable. According to the natural RBV theory, environmental practices and GI describe the relation between ecological resources and an organization's competitive advantage [4]. As a result, the GI is used as a mediating variable in this study between the CSR and EP as well as GF and EP of Bangladeshi banking institutions, and the following hypotheses were subsequently developed:

H6. *GI mediates the relationship between the CSR and EP of banking institutions.*

H7. *GI mediates the relationship between the GF and EP of banking institutions.*

3. Research Methods

3.1. Research Context

The developed conceptual framework of the study (Figure 1) was tested in the context of private commercial banks (PCBs) operated in Bangladesh. Bangladesh is regarded as one of the world's fastest growing economies [60], with enormous investments and economic expansion prospects to becoming a prominent economic giant in the twenty-first century [61]. Nevertheless, the country is confronted with the challenges of climate change and its various environmental consequences [5]. For instance, Bangladesh is regarded as one of the world's most vulnerable countries to the effects of climate change [62], and as a result, a slew of regulations aimed at mitigating the dangers and negative environmental consequences of climate change have been enacted [63]. In this regard, banking institutions are playing a crucial role in helping combat climate change and achieve the country's sustainable development goals [1,14,16]. Furthermore, research has shown that PCBs are a major contributor of direct and indirect green financing in Bangladesh [1,2,5,64]. As a result, it is critical to investigate how banking firms might improve their organizational environmental sustainability.

3.2. Sampling

The main objective of this study is to examine the relationship between CSR, GF, and EP, as well as the mediating role of GI in the banking sector of an emerging economy like Bangladesh. To accomplish the aforementioned research objectives, the study collected primary data by means of a questionnaire survey and convenience sampling procedure. Convenience sampling is a type of non-probabilistic or non-random sampling in which respondents are chosen and included in the study who match the given parameters, such as the convenience of access, geographic proximity, availability at a specific time, or desire to participate [65]. As a result of the reduced expenses and ease of acquiring the required responses, the convenience sampling technique was a viable option for this study [5,66]. Consequently, data for this study were obtained from bankers at selected Private Commercial Banks (PCBs) in Bangladesh between December 2019 and January 2020. To collect the data, 487 structured questionnaires were administered, and 369 responses were recorded, representing a 75.77% response rate. Owing to the inaccuracy of the data, 12 questionnaires were eliminated, leaving a final sample of 357 questionnaires. According to the empirical findings, about 74.8 percent of the respondents were males, while 25.2 percent were females. In terms of age, the majority (63.3 percent) of respondents were between the ages of 20 and 30 years, 22.7 percent were between the ages of 31 and 40 years, 6.7 percent were between the ages of 41 to 50 years, while the remainder were aged 51 years and over. With regards to education, 70.6 percent of the respondents held a master's degree, 28.6 percent held a bachelor's degree, and only 0.8 percent held a doctoral degree.

3.3. Questionnaire Development

The items used in the questionnaire utilized existing literature to measure the relevant constructs, which were anchored in 5-point Likert scales. The research questionnaire was divided into five information sections: demography, CSR, GF, GI, and EP. The demographic section enquires about the fundamental characteristics of respondents such as their age, gender and educational qualifications. The measurement items for CSR were adapted from previously conducted studies [4,67,68]. CSR is comprised of three dimensions: social, economic and environmental. The social and economic dimensions of CSR consist of four items each, while the environmental dimension consists of three items. Green finance, on the other hand, comprises three items that were adapted from past studies [1,2,37]. In this study, five items were employed in the measurement of the GI from earlier studies [4,69]. Finally, the EP comprises six items that were extracted from a prior study by Wang et al. [50]. The questionnaire items of the study can be shown in Table A1 (see Appendix A).

4. Data Analysis and Results

Employing the AMOS 26, the Structural Equation Modeling (SEM) method was used to assess the hypotheses that were postulated in this study. The SEM is a multivariate statistical tool that is frequently used to validate the link between latent variables [70]. According to Hair et al. (2021), the SEM approach is more suited for complex and simple models. Furthermore, it was suggested that the CB-SEM is superior to PLS-SEM in the estimation of existing study variables [71]. In addition, CB-based SEM is utilized to examine the existing theory, whereas PLS-based SEM is ideal for theory formation and prediction during the exploratory stage [2]. Since the research framework for this study was constructed based on existing studies, CB-SEM was used in this study to explore the associations between the variables. As a result, a two-stage SEM technique, as proposed by Anderson and Gerbing [72], was used to analyze the obtained primary data. To assess the validity and reliability of the measurement model, the Confirmatory Factor Analysis (CFA) was also employed in the first step, while the SEM technique was utilized in the second stage to determine the structural links existing between the latent constructs. The study findings are further discussed.

4.1. Measurement Model of the Study

Assessment of the psychometric qualities of the scales, as well as the corrections for common method bias were required prior to the estimation of the structural model. This study utilized CFA results alongside the robust maximum likelihood approach to address these concerns [72]. Therefore, in assessing the measurement model, the variables were evaluated in terms of reliability and validity, and Table 1 summarizes all of the findings. According to the table, individual item values range between 0.586 and 0.983, which exceeds the recommended threshold value of 0.50 [70]. This implies the absence of reliability issues in the individual items in the study. Furthermore, the coefficient values of Cronbach's Alpha (CA) and Composite Reliability (CR) were utilized to examine the internal consistency and reliability of the proposed research model. CA and CR values exceeding 0.7 were deemed acceptable by Hair et el. (2010). The empirical findings indicated that the CA values range from 0.7202 to 0.854, while the CR values range between 0.794 and 0.897, as highlighted in Table 1. Based on these results, it can be inferred that the variables and their measurement constructs employed in this study are acceptable and satisfactory in terms of internal consistency and reliability [70,73].

Table 1. Measurement Model Estimates.

Variables/Items	Convergent Validity		Reliability			Descriptive Statistics			
	Standard Loadings	Loading Average	CA	CR	AVE	Mean	SD	Skewness	Kurtosis
Green Innovation (GI)									
GI1	0.964	0.813	0.835	0.897	0.752	3.94	0.882	−0.805	0.833
GI2	0.983					3.93	0.892	−0.817	0.888
GI3	0.601					4.01	0.770	−0.358	−0.405
GI4	0.586					4.08	0.814	−0.837	0.981
GI5	0.931					4.18	0.785	−0.683	−0.070
Social Dimension of CSR (SD_CSR)									
SD_CSR1	0.897	0.751	0.794	0.840	0.572	4.09	0.757	−0.546	0.208
SD_CSR2	0.759					4.08	0.777	−0.710	0.965
SD_CSR3	0.695					4.07	0.746	−0.690	1.027
SD_CSR4	0.651					4.05	0.750	−0.681	1.000
Environmental Dimension of CSR (END_CSR)									
END_CSR1	0.817	0.747	0.722	0.794	0.564	4.05	0.696	−0.514	0.261
END_CSR2	0.751					4.09	0.782	−0.553	−0.156
END_CSR3	0.678					4.07	0.696	−0.443	0.234
Economic Dimension of CSR (ED_CSR)									
ED_CSR1	0.749	0.727	0.791	0.819	0.532	3.89	0.892	−0.756	0.548
ED_CSR2	0.802					3.96	0.895	−0.786	0.688
ED_CSR3	0.647					3.92	0.874	−0.660	0.381
ED_CSR4	0.710					3.91	0.896	−0.900	1.002

Table 1. *Cont.*

Variables/Items	Convergent Validity		Reliability			Descriptive Statistics			
	Standard Loadings	Loading Average	CA	CR	AVE	Mean	SD	Skewness	Kurtosis
Green Finance (GF)									
GF1	0.910	0.802	0.753	0.846	0.649	4.08	0.764	−0.437	−0.343
GF2	0.725					4.05	0.707	−0.307	−0.244
GF3	0.771					4.08	0.759	−0.307	−0.244
Environmental Performance (EP)									
EP1	0.776	0.741	0.854	0.880	0.553	4.08	0.760	−0.490	0.034
EP2	0.633					4.00	0.757	−0.508	0.524
EP3	0.721					4.03	0.786	−0.434	−0.151
EP4	0.819					4.01	0.805	−0.631	0.604
EP5	0.759					4.04	0.776	−0.679	0.575
EP6	0.739					4.06	0.788	−0.481	−0.113
Model fit indices									

χ^2/df	*p*-value	SRMR	GFI	IFI	RMSEA
1.769	0.000	0.039	0.911	0.932	0.046

Note. CA = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Explained; SD = Standard Deviation; χ^2/df = Chi-square/degree of freedom; SRMR = Standard Root Mean Square Residual; GFI = Goodness-of-Fit Index; IFI = Incremental Fit Index; RMSEA = Root Mean Square Error of Approximation. Significant at a *p* value of 0.001.

To verify the convergent validity of the study variables, the Average Variance Explained (AVE) values were employed as suggested by Hair et al. (2010). According to the results highlighted in Table 1, the AVE values range from 0.532 to 0.753, which exceeds the recommended value of 0.50 [70]. Hence, this study satisfies the convergent validity requirement of an AVE value of 0.50 or more (Hair et al., 2010). Besides, the Fornel and Larcker, as well as the Heterotrait-Monotrait Ratio (HTMT) methods, were used to examine the discriminant validity of the study variables. According to the empirical results in Table 2, the AVE for each factor exceeded the square of its correlation coefficients for other corresponding factors [73]. The HTMT values for all variables, on the other hand, were less than 0.90, as shown in Table 3, confirming the absence of discriminant validity concerns [74]. Therefore, based on the outputs, it can be concluded that the analyzed discriminant validity among the variables is validated and deemed acceptable [70,73,74].

Table 2. Discriminant Validity of the Construct and Variance Inflation Factor.

Variables	EP	GI	SD_CSR	END_CSR	ED_CSR	GF	VIP
EP	0.743						-
GI	0.733	0.867					1.522
SD_CSR	0.479	0.526	0.756				1.389
END_CSR	0.399	0.467	0.403	0.751			1.193
ED_CSR	0.461	0.627	0.517	0.174	0.729		1.465
GF	0.475	0.512	0.235	0.222	0.415	0.806	1.195

Notes: Diagonal elements are the root squared AVE values. Elements below the diagonal are the constructs' correlations. EP, environmental performance; GI, green innovation; SD_CSR, social dimension of CSR; END_CSR, environmental dimension of CSR; ED_CSR, economic dimension of CSR; GF, green finance; VIP, variance inflation factor.

Since the present study utilized questionnaires in the collection of data on both endogenous and exogenous variables from a single source, Common Method Bias (CMB)

could have occurred and resulted in bias data. It is important for researchers to assure respondents of the anonymity of their information during the data collection process. According to Podsakoff and Organ (1986), CMB is a serious problem typically linked to self-survey reports, while Conway and Lance (2010) explained that the CMB was capable of overestimating the relationship between measured variables. In addition, the CMB is computed in this study using the Harman's single-factor approach, and results showed that a single-factor reveals 27.529% of the total variance, and as a result, CMB is not an issue [75]. A total variance value exceeding 50% indicates the presence of a CMB issue, while a CMB value lower than 50% suggests the absence of a CMB problem (Podsakoff & Organ, 1986). Finally, as indicated in Table 1, the various model fit indices were employed to validate the measurement model and are listed as follows: $\chi^2/\mathrm{df} = 1.769$; p-value = 0.000; SRMR = 0.039; GFI = 0.911; IFI = 0.932; and RMSEA = 0.046. The overall model fit was deemed acceptable and satisfactory [76–78].

Table 3. HTMT Analysis.

Variables	GI	ED_CSR	SD_CSR	END_CSR	GF	EP
GI						
ED_CSR	0.602					
SD_CSR	0.547	0.553				
END_CSR	0.467	0.180	0.439			
GF	0.519	0.444	0.292	0.286		
EP	0.685	0.485	0.532	0.421	0.497	

4.2. Structural Model and Hypotheses Testing

To assess the research hypotheses, the SEM structural model was employed via the means of maximum likelihood estimates using AMOS. For model evaluation purposes, the existence of a collinearity problem was investigated. Furthermore, the Variance Inflation Factor (VIF) was examined to investigate collinearity issues among the study variables, and empirical findings revealed that the values range from 1.193 to 1.522, suggesting that all values are below the universally accepted threshold value of 3.3 [70]. In addition, the various model fit indices were also employed to assess the suitability of the structural model presented in Table 4. The fit indices include $\chi^2/\mathrm{df} = 1.794$; p-value = 0.000; SRMR = 0.037; GFI = 0.906; IFI = 0.928; and RMSEA = 0.047. All fit indices were observed to be well within the cut-off values recommended by scholars [70,79]. As a result, it can be said that the overall structural model is suitable and adequate.

Table 4. Hypothesis Results.

Hypotheses	Paths	β Value	*z*-Values	*p*-Values	Remarks
H1	CSR → GI	0.497	10.512	0.000 ***	Supported
H2	CSR → EP	0.286	4.959	0.000 ***	Supported
H3	GI → EP	0.322	4.987	0.000 ***	Supported
H4	GF → GI	0.190	3.469	0.001 **	Supported
H5	GF → EP	0.161	2.900	0.004 **	Supported
H6	CSR → GI → EP	0.160	4.506	0.000 ***	Full mediation
H7	GF → GI → EP	0.061	2.848	0.005 **	Full mediation
		Model fit indices			
χ^2/df	*p*-value	SRMR	GFI	IFI	RMSEA
1.794	0.000	0.037	0.906	0.928	0.047

Note: ** $p < 5\%$; *** $p < 1\%$.

The outcome of the structural model is depicted in Figure 2 and Table 4. The findings indicated the invalidation of Hypothesis 1, revealing that the CSR had a significant positive impact on GI (β = 0.497, z = 10.512, and p = 0.000). The CSR activities also depicted a significant positive impact on the EP (β = 0.286, z = 4.959, and p = 0.000), supporting Hypothesis 2. The empirical results revealed that the GI is significantly related to the EP (β = 0.322, z = 4.987, and p = 0.000), therefore supporting Hypothesis 3. Similarly, it is clear from the outputs that the GF had a significant influence on the GI (β = 0.190, z = 3.469, and p = 0.001), supporting Hypothesis 4. The study also confirmed that the GF had a significant positive impact on the EP (β = 0.161, z = 2.900, and p = 0.004), implying the supporting of Hypothesis 5. Furthermore, the study used the Sobel test for the mediation hypotheses, according to the study [77]. The Sobel test determines whether a variable carries (or mediates) the effect of an independent variable on the dependent variable [80]. The test statistics (z value) of the Sobel test can be calculated by using the following formula:

$$\text{Sobel test statistic}: \; z = \frac{ab}{\sqrt{(b^2 SE_a^2) + (a^2 SE_b^2)}}$$

where a is the regression coefficient for the association between the independent variable and the mediator, b is the regression coefficient for the association between the mediator and the dependent variable, SE_a is the standard error of the association between the independent variable and the mediator, and SE_b is the standard error of the association between the mediator variable and the dependent variable. A z value greater than 1.96 in the Sobel test indicates that full mediation existed between the independent and dependent variables [80,81]. Therefore, results from the mediation analysis revealed that the GI significantly mediated the association between the CSR and EP (β = 0.160, z = 4.506, and p = 0.000) GF and EP (β = 0.061, z = 2.848, and p = 0.005), which validates Hypothesis 6 and 7.
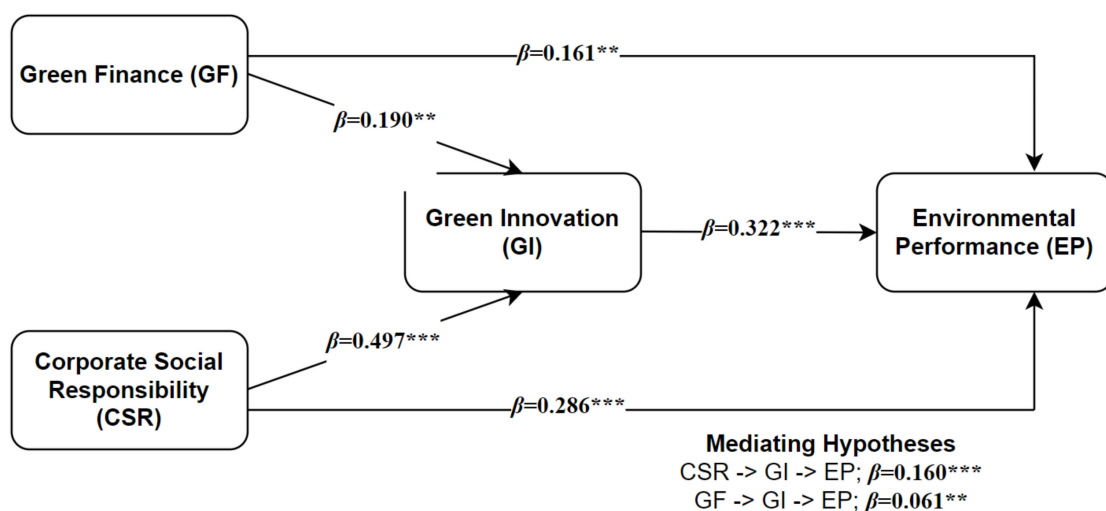

Figure 2. Estimated research model. Note: ** $p < 5\%$; *** $p < 1\%$.

4.3. Robustness Tests

To check the robustness of the conceptual model, the study further utilized hierarchical multiple regression (MR) analysis and the Sobel test for mediation to confirm the findings of the SEM, as can be shown in Table 5. The hierarchical MR was employed using SPSS v.26. According to the findings of SEM and hierarchical MR analysis, all hypotheses have been supported and verified. As a result, it is possible to conclude that the results across the models are nearly identical, confirming the robustness of the conceptual model utilized in this research.

Table 5. Robustness Tests.

Hypotheses	Paths	SEM Outputs			MR Outputs			Remarks
		β Value	*z*-Values	*p*-Values	β Value	*z*-Values	*p*-Values	
H1	CSR → GI	0.497	10.512	0.000	0.493	10.769	0.000	Verified
H2	CSR → EP	0.286	4.959	0.000	0.292	5.680	0.000	Verified
H3	GI → EP	0.322	4.987	0.000	0.315	6.074	0.000	Verified
H4	GF → GI	0.190	3.469	0.001	0.189	4.134	0.000	Verified
H5	GF → EP	0.161	2.900	0.004	0.152	3.327	0.001	Verified
H6	CSR → GI → EP	0.160	4.506	0.000	0.155	5.291	0.000	Verified
H7	GF → GI → EP	0.061	2.848	0.005	0.059	3.417	0.001	Verified

Note: significant at the *p* value of 1% and 5%.

5. Discussion and Conclusions

This paper examined the association between CSR, GF and EP, alongside the mediating role of GI in the banking sectors of an emerging economy. The empirical findings of the study indicated that CSR has a substantial positive relationship with GI. These findings are supported by the past studies of Kraus et al. [4] and Hao & He, [82], where it was revealed that CSR significantly influences the GI. Besides, a partial endorsement of these results can also be found in the past study on environmental CSR and innovation [83]. Furthermore, the empirical findings confirmed that CSR significantly influences the EP of banking institutions. The findings are similar to the studies of [58,84], which demonstrated that CSR significantly improves organizational performance. Besides that, the empirical finding is consistent with the legitimacy theory, which explains the engagement of banking institutions in spending and implementing CSR initiatives, as social pressure and regulatory standards have required businesses to engage in CSR practices in order to promote social acceptance and environmental sustainability [16,34,85]. Moreover, Hernández et al. [8] discovered that CSR elements (social, economic and environmental) significantly enhance the economic performance of SMEs in Spain. On the contrary, the findings deviate from the study of [4], which stated that CSR does not influence the EP of manufacturing firms in Malaysia. The empirical results of the current study indicated that CSR has a significant positive impact on EP, therefore, managers and owners should implement CSR activities, as past research has shown that it plays an important role in the prediction of organizational performance.

As expected, the results indicate that GI significantly determines the EP of banking institutions, implying that green initiatives such as green technology, green banking, online banking, and online customer service help banking institutions improve their EP. A similar finding is cited by the study of [4], who found that GI has a significant impact on the EP of a large manufacturing organization. The findings revealed that GF has a significant positive impact on GI, indicating that green financing is significantly influencing the firms' green innovation. Therefore, it is suggested that managers of an organization should focus more on financing eco-friendly projects as it enhances the organization's green innovation. This finding is supported by the study of [54], who found that green finance significantly enhance corporate technological innovation. Furthermore, GF significantly determines the EP of banking institutions, meaning that financing of various eco-friendly projects such as renewable energy, green industry development, and waste management other than traditional ones helps to improve organizational environmental sustainability. This finding is consistent with the studies of [16,86], which revealed that GF significantly enhances EP. Hence, it can be inferred that green financing plays a crucial role in improving organizations' green innovation and environmental performance.

Finally, the findings indicated that the GI significantly mediated the link between CSR and EP. These results are consistent with the study conducted by Kraus et al. [4], where it was revealed that CSR had no direct impact on EP, but has an indirect impact via the

presence of a mediating factor such as green innovation. The arguments are also related to the legitimacy theory, which claims that GI justifies the link between CSR and EP [34]. In addition, the empirical findings showed that the relationship between GF and EP is significantly mediated by the GI. This is a pioneering study that examines the relationship between GF and EP with the help of the mediating variable of GI in the context of banking institutions. Furthermore, the results demonstrated that GI fully mediates and weakens the associations between these variables. This relationship has changed because the GI is the most important factor that affects how well banks take care of the environment, followed by CSR and green finance. Hence, it is possible to conclude that GI considerably improves the EP of banking institutions by lowering carbon emissions, and energy consumption, and offering green training to employees on energy and paper savings. Subsequently, major theoretical and practical contributions are further discussed.

5.1. Theoretical Contributions

The study's empirical results add to the existing literature on CSR, GF, GI, and EP in the context of banking institutions in emerging economies in a number of ways. First, based on the concept of legitimacy theory, this is one of the earliest studies to look at the relationship between CSR, GF, GI, and EP in the context of banking institutions in an emerging economy, which is one of the major theoretical contributions of our study. Previous researchers utilized the stakeholder, natural RBV, ability motivation–opportunity, and contingency theories for CSR, GI, and EP in various organizations such as large manufacturing firms and SMEs [4,38,39]. Since the measurement scales have been verified using statistical analysis techniques like SEM, the theoretical model developed in this study could be adopted to new scenarios or other developing countries in general. Second, the findings of the study contribute to the existing literature by adding the mediating role of GI in the relationship between CSR and EP, as well as GF and EP, which earlier studies mostly overlooked in the context of banking institutions. Previously, Kraus et al. [4] discovered that environmental strategy and GI significantly mediates the relationship between CSR and EP in the context of large manufacturing firms. Third, the study's findings validated and expanded on the legitimacy theory by demonstrating how organizations that incorporate CSR, GF, and GI initiatives into their operational processes help them gain, maintain, and restore legitimacy while also assisting them to achieve overall environmental sustainability.

5.2. Practical Implications

The findings of this research have significant consequences for bank managers, business experts, scholars and legislators of a developing countries like Bangladesh. The research intends to guide banking institutions on the impact of CSR, GF, and GI on EP's execution. Since bank executives and legislators of today are focused on EP, they can simply utilize the framework of the study of EP in emerging nations to reduce wastes, emissions and industrial pollution, and conserve water, electricity, and renewable and non-renewable resources, all of which leads to better EP. The findings revealed that CSR and GF have a significant positive impact on EP through the mediating effect of GI. As a result, bank managers should implement CSR activities and GF in the evaluation of EP, as prior research has shown that CSR activities improve organizational success in terms of cost, market and EP [27]. Furthermore, the study's findings can help bank managers promote corporate brand value and social welfare by implementing various CSR activities like as grants and scholarships, livelihood development, distant healthcare, water management, and emergency relief initiatives. Hence, to assess EP, bank managers and legislators must be focused on CSR, GF and GI. Moreover, empirical evidence showed that the CSR and EP of banks benefit greatly from GI. As banks with GI are more CSR-focused, their activities are more likely to have a positive impact on green innovation and the environment. Therefore, the findings of this study will also be helpful for other developing countries like Bangladesh in order to achieve organizational environmental sustainability through the implementation of CSR activities, GF, and GI.

5.3. Limitations and Future Research

As with many previous studies, this current one has a number of limitations, which may weaken the effectiveness of the study while availing future researchers a potential topic idea. The study employed a cross-sectional methodology, and experts are uncertain whether CSR, GF, and GI in banking institutions provide the same results over time. As a result, future researchers can undertake a longitudinal research approach to see if outcomes change or remain constant over time. Data for this study was acquired from bankers of Bangladesh's private commercial banks, while future researchers may also collect data from other banking organizations to observe the changes in results. GF and employee green behavior can also be used as a mediating construct between CSR and EP by future research works to confirm their significance. Finally, because the current study was conducted in Bangladesh—which has its unique culture—future researchers can conduct comparable studies in other developing countries like Pakistan, India and Nigeria to examine how things have changed.

Appendix A

Table A1. Questionnaire Items.

Green Innovation (GI)	
GI1	Our bank is using green technology.
GI2	Our bank is practicing green banking activities.
GI3	Our bank is implementing a green strategy.
GI4	Our bank is ensuring an eco-friendly work environment.
GI5	Our bank is offering customer service online.
Social Dimension of CSR (SD_CSR)	
SD_CSR1	Our bank is creating a balance between work and family life for employees.
SD_CSR2	Our bank is assessing the impact of our activities on the local society.
SD_CSR3	Our bank is ensuring work safety.
SD_CSR4	Our bank is working together on charitable and social projects.
Environmental Dimension of CSR (END_CSR)	
END_CSR1	Our bank is analyzing the ecological consequences of activities.
END_CSR2	Our bank is establishing renewable energy sources.
END_CSR3	Our bank is implementing activities that promote environmental responsibility.

Table A1. *Cont.*

Economic Dimension of CSR (ED_CSR)	
ED_CSR1	Our bank is offering a competitive salary package.
ED_CSR2	Our bank respects customers and suppliers equally.
ED_CSR3	Our bank is carrying out cost-effective operations.
ED_CSR4	Our bank is managing financial risk.
Green Finance (GF)	
GF1	Our bank is investing more in renewable energy sectors.
GF2	Our bank is investing more amount in energy efficiency sectors.
GF3	Our bank is investing more in green sector development.
Environmental Performance (EP)	
EP1	Our bank is lowering the carbon footprint from banking activities.
EP2	Our bank is reducing energy consumption from banking activities.
EP3	Our bank is enhancing banks' adherence to environmental regulations.
EP4	Our bank is delivering the employees' training on energy conservation and environmental preservation.
EP5	Our bank is collaborating with green suppliers and organizations.
EP6	Our bank is promoting environmentally friendly technologies.

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