

INFLUENCE OF CORPORATE SOCIAL RESPONSIBILITY ON FINANCIAL PERFORMANCE OF LISTED PRIVATE COMMERCIAL BANKS IN BANGLADESH: AN ECONOMETRIC ANALYSIS

Dr. Monirul Islam Akhand<sup>1</sup>, Professor Dr. Md. Abdul Hamid<sup>2</sup>, Professor Dr. Md. Nazrul Islam<sup>3\*</sup>, Shimla Akter<sup>4</sup>,

<sup>1</sup>*monirisakhand@gmail.com*

<sup>2</sup>*Department of Business Administration, Shahjalal University of Science and Technology, Sylhet- 3114, Bangladesh. E-mail: mahamid-bus@sust.edu*

<sup>3\*</sup>*Department of Business Administration, Shahjalal University of Science and Technology, Sylhet- 3114, Bangladesh. E-mail: dnislam969-bus@sust.edu*

<sup>4</sup>*MBA student, Department of Business Administration, Shahjalal University of Science and Technology, Sylhet- 3114, Bangladesh, E-mail: shimplatalukder1999@gmail.com*

**\*Corresponding Author:**  
*dnislam969-bus@sust.edu*

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**Abstract:**

*Key objective of this study was to measure the role of CSR on corporate financial performance in Bangladesh. It has measured the performance of all (30 in 2015) listed private commercial banks (PCBs) of Bangladesh. Those organizations were studied for a ten-year period ranging 2011-2020. The statistical techniques of analyzing panel data especially OLS, random effect, fixed effect, GMM and dynamic GMM methods have been used. The econometric model has been developed where CSR expenditure is a dependent variable and financial performance indicators of the firm (e.g. ROA, ROE, TobinQ, EPS and market price of share) are considered as independent variables. Data analyses show that CSR has a positive effect on the corporate financial performance in Bangladesh.*

**Keywords:** *CSR, financial performance, financial effect, Bangladesh.*

## INTRODUCTION:

The concept of corporate social responsibility (CSR) was invented for a noble cause. To support stakeholders of an organization and its surrounding community, undoubtedly it was a great initiative. It could contribute to improving good governance, community welfare, environment friendly programs, workplace safety, and so many other things in any organization. Even the betterment of the remote community can be initiated by CSR activities of an organization. In the developed nations the regulators and pressure groups monitor such activities of the organizations carefully. Even the customers give it much value. Their buying decisions are influenced by the taken CSR programs of the institutions. In Bangladesh, the level of awareness in this regard is increasing gradually. The government of Bangladesh is also trying to formulate relevant rules and regulations to make it functional among all concerned parties. In this perspective, effect of CSR in boosting financial performance in the PCBs of our country is to be examined minutely. Bangladesh Bank (BB) as a regulator and highest policy making body, first in the country promulgated circular for CSR activities by the financial institutions (FIs) in 2008. By which the BB limited the FIs for CSR expenditure in terms of streams of CSR and reporting of CSR (Bangladesh Bank, 2008). Through this circular, BB imposed rules to provide reports of CSR activities by specific and its impact on social and environment. Further BB also ordered the FIs to report the activities on gender equality. In the line of CSR, BB (2011) circulated policy for environmental risk management considering the deterioration in environment, water pollution, air pollution and banks are advised to give suggestions if they experience any kind of trouble in following given guidelines. The regulator continued its logistic support to banks through conducting exclusive training programs, seminars, and workshops upon the request from the banks for their capacity building on ERM issue. In addition, BB (2011) issued policy guidelines for green banking indicative activities of both in house and outer houses.

Later the central governing body has issued detailed procedures on environmental and social hazards control for banks and financial institutions (BB, 2017). It includes the investment risk, financial risk, social risk, and environmental risk for FIs. Finally, the apex body has issued comprehensive instructions on the above-mentioned issues for all functioning banks and related organizations; it includes CSR related issues in detail (BB, 2022). Since 2008 BB has been recommending the concerned institutions to follow the guidelines properly (Mahbuba & Farzana, 2013). All related bodies are trying to encourage the concerned organizations to carry out their CSR activities in an organized way. New generation organizations would like to comply with this trend from the very beginning. In that case, the GoB encourages CSR by offering 10% tax exemption on the allowable CSR expenditure or 20% of gross income which is lower (National Board of Revenue, 2011, 2012 & 2014). The different survey Rahman and Ahmed (2013); Tania and Jamal (2020) and Ferdous (2015) on CSR expenditure by banks explored the following disbursements sectors of CSR:

**Table-1: CSR activities in banking industry of Bangladesh**

Humanitarian- Disaster and Relief	Financial Inclusion	Invention
Education	Self-employment	Helping the poor, marginal, agriculturists
Health	Liberation war related	beautification
Sports	Publication	promoting green banking
Arts and Culture	Poverty reduction & rehabilitation	promoting green products
Environment	Expansion of technology	Others
Control air water pollution		

Most of the banks and financial institutions are incurring expenditure on CSR complying the set rules and regulations of Bangladesh Bank. The rest organizations are kept under supervision so that they can do well in the near future. But the banking sector can be treated as the pioneer in Bangladesh. The expenditure scenario on CSR of sample banks is given in table-2.2 for the period 2011-2020.

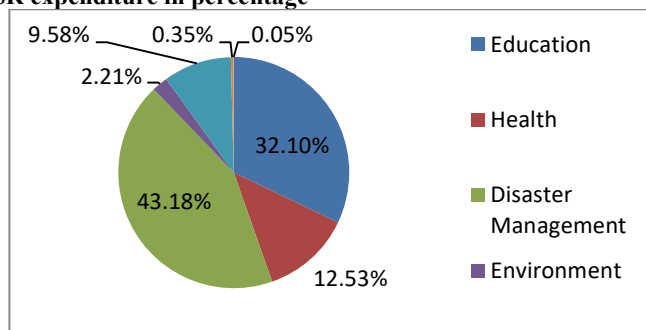
**Table-2: Statistics of CSR expenditure by sampled listed private commercial banks of Bangladesh during 2011-2020.**  
(Million Taka)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total	1891.50	2590.70	3588.00	4579.70	4127.90	4083.90	6921.40	8414.10	5965.60	8886.10

Source: Official documents of Bangladesh Bank

Table-2 represents the CSR expenditure of PCBs during 2011-20. The gradual development of the sector might be a reason for such improvement. As stated earlier the Bangladesh Bank issued detailed guidelines of conducting CSR expenditure with the order (Bangladesh Bank, 2008). That guideline indicated the CSR expenditure clearly but did not mention specifically and hence it did not record CSR expenditure incurred by listed bank by sector-wise till to 2014 and from 2015 it has been recorded CSR expenditure incurred by the listed banks sector-wise. Here the percentage distribution of CSR by sector-wise is given in figure-1.

**Figure -1: Sector-wise CSR expenditure in percentage**



## 2. Literature Review:

In this modern era, CSR is widely accepted and practiced philosophy worldwide. Most of the dynamic organizations keep a significant budget each year for this purpose. Diverse fields of study are connected with this issue. For example- the practitioners of economics, law and justice, and sociology are highly connected to this phenomenon. How the management people do this practice, many parties have been interested in it. Even mass people have also been curious to know the social welfare schemes of the large corporations. For this reason, it is not only a matter of businessmen or the concerned governments. Most probably for this reason, the people of diverse fields do research on this issue. Their paradigm also affects the outcome of the studies. Good number of articles are available on CSR activities and its impacts on organizational performances. But very few are noticed from Bangladesh perspective, especially on banking issues. However, the major findings of the concerned studies are presented below:

Sang et al. (2019) has identified a fractional optimistic connotation of CSR with the profitability and firms' value. On the other hand, Osisioma et al. (2015) has found that a strong positive relationship exists between investment in CSR and corporate profit by using secondary data from the 2011-2012 stock exchange of Nigeria. This implies that performing responsibility to the society makes a positive contribution to organizational performance. Ahmed et al. (2016) investigated the characteristic features of the CSR and CFP. It has found that banks with a high CSP have a higher average ROA ratio than the similar organizations which have a lower CSP. CSP, size, risk, research and development, advertising intensity are independent variables in this study, while ROA, ROE, ROI, EPS, Return on Sales, total assets and growth of sales are dependent variables. They explored a positive overtone between the CFP and CSR and this also identified in another of study of Saha et al. (2020) who examined the effect of ethical leadership and CSR on CFP and revealed that ethical leadership and personal values are closely connected.

As per the study of Yang et al. (2019) the link between CFP and CSR are found. Some other studies do not find the same result. For example, Setiawan et al. (2020) tried to explore whether any significance association exists between CSR and firm performance. They have not found any mentionable relationship between the above-mentioned activities. Some studies have found a mixed outcome like Resmi et al. (2018). This study found varied results on CSR and CFP. Moreover, ROA, ROI, EPS, and net income are considered as the measure of CFP. They used secondary data from financial reports for the period of 2015-2017 and found net income and ROE has a positive correlation. According to this study, some firms have been identified which do practice CSR but ROA and EPS have no significant impact on CFP.

In a study Alikaj et al. (2017) have tried to assess the dimensions of KLD by distinguishing CSR strengths or concerns. They have also measured specific impacts on CFP. The results represent that any change in CSR activities have direct impact on CFP. On the other hand, a neutral relation between CSR and the firm's CFP has been found in a study (Feng et al. 2017). As per this study, performing social responsibilities have better implications in most of the cases. But the outcomes might differ in the diverse industries. CSR can be classified into four categories. Those are: environment-oriented CSR, employee-oriented CSR, society-oriented CSR, and market-oriented CSR (Bahizire and FangLin, 2020). Bai & Chang (2015) surprisingly identified negative correlation with firm performance and CSR. They also mentioned CSR as a monetary encumbrance for the organizations operating in China.

Kooskora et al. (2019) examined relationships between CFP and CSR. They have explored an adverse association between the above-mentioned factors. It also has a negative impact on ROA which was the outcome variable. Selcuk and Kiyamaz (2017) have investigated emerging markets to reveal the effects of CSR on the firms' CFP on the listed firms of Bursa, Istanbul for the period of 2009 to 2011. They have also found an undesirable affiliation between CFP and CSR. It means that the firms which disclose more information regarding social responsibility in the annual reports, have a lower ROA. On the other hand, few studies (e.g. Assaf et al., 2017; Rahman et al., 2020) have documented positive relations between the discussed factors (CFP and CSR). The relationships between promotional costs and CFP have been found to be slightly moderate. They have concluded that firms having better CFP, perform better in CSR events.

Manokaran et al. (2018) conducted a study with the evidence of insurance firms of Malaysia to establish the linkage between CFP and CSR. They revealed that CSR has a noteworthy influence on ROA. But the relations among CSR, ROE and EPS are found trivial. Uddin & Rahman (2015) assessed the association of CFP and CSR underlying assumption that performing social responsibilities affect corporate image and trust, customer satisfaction, and sustainable competitive advantage positively with survey data and undertaken three related factors as mediators to show how and why CSR influences firms' performance and found an affirmative connection between the two factors. Singh & Misra (2021)

reported a mixed relation between CSR and CFP after studying by providing 400 questionnaires while 85% were usable to European multinational companies of India. In another study Cho et al. (2019) made an investigation to identify the consequence of social activities on CFP. It found CSR is meaningfully correlated with CFP. They used ROA as a proxy for firm profitability while proxy of firm value was Tobin's Q.

Ting and Yin (2018) conducted a study in Taiwan from the period of 2007 to 2016 for examining the impact of different dimensions of CSR on CFP. It found a positive connection between the two factors. Lin et al. (2019) identified that CSR and CFP have neutral relationships after analyzing the data of 100 US companies for the year from 2007 to 2016 using the GMM. On the other hand, Rehman et al. (2020) reported negative relations between these factors in the Pakistani banking sector. They conducted this study based on the annual reports of four Islamic banking institutions which operated in Pakistan (between 2012 and 2017). Akinleye and Faustina (2017) have undertaken an investigation to find out the effect of such social activities on CFP of five multinational companies working in Nigeria from 2010 to 2014. It found that spending for CSR and profit after tax have a weak negative correlation. Weber and Chowdury (2020) tried to acquire the linkage between sustainability performance, a part of CSR and CFP and they found higher sustainability performance (CSR) makes a higher CFP.

Halbusia & Tehseen (2017) recognized the effect of CSR on worker's approaches and behaviors after giving an overview of CSR. They identified a constructive association between social responsibility and workers' attitude. In general, welfare initiatives taken by the organization gives confidence to the employees. They become loyal, work hard, and pay more attention to achieve organizational goals. If they feel that they are not being exploited by the employers, they feel safe and work hard to be part of that noble venture. Sinha et al. (2018) examined the association between CSR and economic performance. By using the stakeholder approach (SME industry) taking a sample of 382 and finding indicated a weak positive association among social activities and financial performances. Other study shows that there is a lack of harmony concerning the causes of relations between CSR and CFP (Arias et al., 2021). Another study has explored how social responsibility dimensions affect CFP whether the arbitrating consequence of particular administrative issues define the connection between CSR and CFP (Hossain et al., 2019).

The above discussed findings clearly demonstrate that corporate social responsibility and CFP are positively correlated. Besides, different organizational factors facilitate the CFP and CSR activities. Institutional and organizational elements have different roles in different perspectives. In the case of Bangladesh, such studies are not available. This study attempted to fill this gap by conducting this research initiative.

**3. Research Problem:** CSR by listed Bangladeshi commercial banks plays a significant role in the socioeconomic expansion as well as sustainable development of Bangladesh. The review of past studies clarified that there are numerous witnesses that CSR has an encouraging impact on corporate performance. On the other hand, there are few observations of researchers that CSR plays a negative role on corporate financial performance. Another group of researchers have found that CSR has a mixed role on corporate performance. The studies explore positive, negative, neutral, and zero association of CSR with corporate financial performance. Till now no depth study in this regard has been conducted including all the listed Private Commercial Banks (PCBs) in Bangladesh. Though the real philosophy of CSR is most rightly applied in the developed countries as the companies behave highly for community development but it has been getting importance in the developing countries since the beginning of the twenty first century. CSR in Bangladesh emerged during the 1980s (Rahman and Ahmed, 2013). The companies in Bangladesh are doing CSR but there are no uniform rules and practices in reporting CSR (Sufian, 2012). In the Company Act there is no direct guideline of CSR activities and there is no accounting standard of CSR still (Jamal and Tania, 2020). Rahman et al. (2020) identified CSR expenditure as having noteworthy positive influence on stock prices as the market participants to understand the potential risk of the firm. The study will find whether there is any role of CSR expenditure on the monetary enactment of listed private commercial banks in Bangladesh or not.

**4. Objectives:** The core objective of this research was to make an analysis of the CSR in terms of economic performance of registered private commercial banks of Bangladesh. The detailed objectives were to:

- (i) investigate the association between CSR expenditure and monetary performance of listed private commercial banks in Bangladesh;
- (ii) policy recommendation for improving CSR activities of the studied commercial banks of Bangladesh.

**5. Hypotheses:** Many scholars have found the connotation between CSR activities and CFP of an organization. Among them Choi et al., 2010; Orlitzky et al., 2003; Saeidi et al., 2015, Yang et al., 2019, Resmi et al., 2018, Mohammed et al. 2017, Preston and O'Bannon, 1997, Moore, 2001, Kooskora et al., 2019, Griffin and Mahon, 1997, Selcuk and Kiyamaz, 2017 are mentionable. The total variable used by them ROA, ROE, ROI, EPS, TobinQ, growth of Total Asset, growth of sales, operating income growth, growth of net income, gearing ratio, return on sale, risk, age of firm but the mostly used variables are ROA, ROE, sales or total revenue (TR), TA, TL, market value of stock price, LR and TobinQ. From this perspective the following hypotheses have been developed:

- i. H<sub>1</sub>: CSR is determined by the financial performance of the banking industry of Bangladesh. This hypothesis has given congenital the following hypotheses as the financial performance is measured by ROA, ROE, TobinQ, EPS, TA, LR, SP, TR, TE, , and SP. This hypothesis again can be divided into ten hypotheses as-
- ii. H<sub>1.1</sub>: ROA has a positive impact on CSR;
- iii. H<sub>1.2</sub>: ROE has a positive impact on CSR;

- iv. H<sub>1.3</sub>: TobinQ ratio is an important instrument of CSR;
- v. H<sub>1.4</sub>: Leverage Ratio (LR) is an important determinant of CSR;
- vi. H<sub>1.5</sub>: Volume of Total Asset (TA) has a positive impact of is an important determinant of CSR;
- vii. H<sub>1.6</sub>: Stock Price (SP) has a positive impact on CSR expenditure;
- viii. H<sub>1.7</sub>: Price Earning (PE) Ratio has a negative impact on CSR expenditure;
- ix. H<sub>1.8</sub>: Total Revenue (TR) has a significant positive impact of CSR;
- x. H<sub>1.9</sub>: Volume of Total Expenditure has a positive impact on CSR;
- xi. H<sub>1.10</sub>: EPS has a positive impact on CSR;

**6. Methodology:** Population of this research was the listed private commercial banks in Bangladesh (PCBs). We have 30 listed PCBs in our country. The study has been conducted based on the published data. Those data have been collected from the annual reports of the sampled banks, Bangladesh Bank (BB) and published and unpublished research articles, reports and thesis for the period 2011-2020. Collected data have been analyzed by using relevant statistical tools and techniques.

**7. Econometric Model of the study:** Saeidi et al. (2015) measured CFP by ROA, ROE, ROI, EPS, ROS, total assets and sales growth. They also included while firm's size, age and revenue are considered control variables; Ahmed et al. (2016) measured CFP by ROA, ROE, ROI, EPS, ROS, total assets and sales growth; McGuire et al. (1988) measured accounting based performance i.e. CFP by ROA, growth of sales, assets and operating income; Yang et al. (2019) measured CFP by Tobin's Q, ROA, ROE, and EPS; Resmi et al. (2018) measured CFP by ROA, ROA, EPS and net income; Jang et al. (2019) used ROA & ROE as proxy of firm's profitability and Kooskora et al. (2019) considered ROA and EPS as the proxy of CFP. Considering the previous literature and the referencing these studies, econometric model is used for analyzing data:

$$CSR_{i,t} = \alpha + \beta_0 Y_{i,t-1} + \beta_1 ROA + \beta_2 ROE + \beta_3 TA + \beta_4 TR + \beta_5 TobinQ + \beta_6 LR + \beta_7 SP + \beta_8 PE + \beta_9 TE + \beta_9 EPS + U_{i,t}$$

Table-3: Description of different types of variables used in the study			
	Variable(s)	Acronym	Definition
1	CSR expenditure (Dependent Variables)		
2	Return on Assets	ROA	Net profit after tax/total assets.
3	Return on Equity	ROE	Net profit after tax/total equity.
4	TobinQ	TobinQ	Market value of common equity/Book value of common equity
5	Earnings per share	EPS	Net profit after tax available for common stockholders/Number of outstanding common stocks
6	Bank Size	TA	log of total bank assets
7	Leverage	LR	Total debt/total asset
8	Share Price	SP	Market value of Share price
9	Total Revenue	TR	Total operating Revenue
10	Total Expenditure	TE	Total operating Expenditure
11	$U_{i,t}$		Error term

## 8. Analysis and Findings:

**8.1 Correlation co-efficient matrix:** The correlation co-efficient measures the strength of the linear relationship between the variables. Its value ranges from +1 to -1 (Berenson et al., 2013). The correlation co-efficient checks multicollinearity between the variables (Gujarati, 1995; Hair et al., 2010). But only the correlation can't confirm that there is a causation effect (Berenson et al., 2013). Therefore, it shows the one way relationship between the variables. In table-4 the correlation co-efficient matrix is given where the relationships between CSR and others variables are articulated; however only relationships between CSR and others variables are considered for the study.

**Table-4:** Correlation co-efficient matrix among the variables

Variables	CSR	ROA	ROE	TOBINQ	LR	TA	SP	PE	TR	TE	EPS
CSR	1										
ROA	0.04	1									
ROE	0.05	0.16	1								
TOBINQ	-0.08	0.06	0.34	1							
LR	0.29	0.04	0.27	0.10	1						
TA	0.43	0.11	0.05	0.04	0.18	1					
SP	0.18	0.05	0.36	0.33	0.51	0.02	1				
PE	-0.01	-0.01	-0.16	0.04	0.00	0.09	0.03	1			
TR	0.54	0.02	0.07	0.14	0.18	0.71	-0.04	-0.01	1		
TE	0.51	0.01	0.04	0.06	0.25	0.59	0.07	0.01	0.86	1	

EPS	0.40	0.09	0.57	0.21	0.61	0.20	0.71	-0.10	0.19	0.25	1
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Source: Data Analysis

The diagonal elements of the table are always 1, as expected. Other entries in the table show the correlation between the corresponding row and column variables. The correlation coefficients range from -1 to 1. Here -1 indicates a perfectly negative correlation. Here 0 indicates no correlation. And 1 indicates a perfectly positive correlation (Berenson et al., 2015). The covariance matrix shows the covariance between each pair of variables. Covariance ranges from negative to positive infinity. The extent of the covariance doesn't have an intrinsic explanation, but the sign does. The table 4.2 clarified that CSR poor positively correlated with SP (0.18), LR (0.29), ROA (.04), EPS (0.40), TA (0.43), moderate positively correlated with TR (0.54), TE (0.51) and ROE (0.05) while poor negatively correlated with PE (-0.01) and TobinQ (-0.08). Therefore CSR did not exhibit strong positive or negative correlation with any variable. Since the correlation co-efficient values are less than 1 therefore there is no multicollinearity.

### 8.3 Effect of CSR with Financial Performance using Pooled OLS Regression:

**Table-5: Pooled OLS Regression**

Variables	Coefficient	Std. Error	t-Statistic	Prob.
ROA	172.34	296.67	0.58	0.56
ROE	-820.30	269.57	-3.04	0.0026***
TOBINQ	-1326.18	367.65	-3.61	0.0004***
LR	-10.20	234.01	-0.04	0.97
TA	12.79	52.31	0.24	0.81
SP	0.10	0.78	0.13	0.90
PE	0.08	0.27	0.31	0.75
TR	0.02	0.00	4.49	0.00***
TE	0.00	0.01	0.05	0.96
EPS	51.51	9.73	5.29	0.00***
C	-103.98	259.21	-0.40	0.69
R-squared	0.45	Mean dependent var		173.77
Adjusted R-squared	0.43	S.D. dependent var		266.09
F-statistic	23.25	Durbin-Watson stat		1.22
Prob(F-statistic)	0.00			

Source: Data Analysis; Note: \*\*\* (5% level of significance)

Table-5 presented the outcomes of a panel least squares regression analysis. Here CSR is the dependent variable. The ROA, ROE, TobinQ, LR, TA, SP, PE, TR, TE, and EPS are independent. The results suggested that ROE, TOBINQ, TR, TE, and EPS have a noteworthy influence on CSR at the 5% significance level. It means that those variables are statistically substantial in clarifying changes in CSR. On the other hand, ROA, LR, TA, SP and PE, are not significant in explaining CSR. The OLS test also provides evidence about fit of the model. Here the R-squared value is 0.45 which indicates the independent variables explain 45% of the variation in CSR. Here the adjusted R-squared value is slightly lower at 0.43. Standard error is 201.48; it indicates the average difference between the predicted values and the actual values of CSR are around 201.5. Additionally, the table provides information about the AIC, the Schwarz criterion, and the Hannan-Quinn criterion. These are generally used to compare the goodness of fit of different models. Lower values of these criteria indicate a better fit. Finally, the Durbin-Watson value is 1.22; it indicates there is no substantial autocorrelation in residuals. The F-statistic is 23.25, and its associated p-value is 0.00; it indicates the model as a whole is statistically noteworthy.

**8.4 CSR and Corporate Financial Performance:** The random effect of CSR on the CFP of the banks is given in the table-6.

**Table-6: Random effect of CSR on CFP (Panel data regression)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	192.84	249.78	0.77	0.44
ROE	-691.29	291.13	-2.37	0.02***
TOBINQ	-630.84	371.50	-1.70	0.09
LR	73.03	280.10	0.26	0.79
TA	105.86	61.57	1.72	0.09
SP	1.28	0.88	1.45	0.15
PE	0.11	0.24	0.48	0.63
TR	0.01	0.00	2.13	0.03***
TE	0.01	0.01	1.03	0.30
EPS	23.81	10.25	2.32	0.02***

C	-530.53	312.53	-1.70	0.09
Effects Specification				
			S.D.	Rho
Cross-section random			116.22	0.34
Idiosyncratic random			162.42	0.66
Weighted Statistics				
R-squared	0.25	Mean dependent var		70.24
Adjusted R-squared	0.23	S.D. dependent var		187.75
F-statistic	9.75	Durbin-Watson stat		1.63
Prob (F-statistic)	0.00			
Unweighted Statistics				
R-squared	0.40	Mean dependent var		173.77
Sum squared resid	1.3E+07	Durbin-Watson stat		1.01

Source: Data Analysis; Note: \*\*\* (5% level of significance)

Table-6 exhibits the outcomes of random effect panel regression; it appears that the independent variables ROE, TR, and EPS have statistically substantial coefficients with probabilities of 0.02, 0.03, and 0.02. The R-squared value of 0.25 suggests that the model explains 25% variation in the dependent variable, and the adjusted R-squared value (0.23) indicates that the model fits well. The Durbin-Watson score is 1.63. It shows that no substantial autocorrelation is found in the residuals.

**8.5 Effect of CSR on CFP (Fixed Effect):** The outcomes are shown in the following table:

**Table-7: Fixed effect of CSR on CFP**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	213.24	252.24	0.85	0.40
ROE	-637.76	321.30	-1.98	0.0482***
TOBINQ	-427.02	397.25	-1.07	0.28
LR	21.25	344.38	0.06	0.95
TA	144.06	72.59	1.98	0.0482***
SP	1.61	1.05	1.53	0.13
PE	0.12	0.24	0.49	0.62
TR	0.01	0.00	1.13	0.26
TE	0.01	0.01	1.19	0.23
EPS	11.60	11.10	1.05	0.30
C	-686.94	373.32	-1.84	0.07
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.68	Mean dependent var		173.77
Adjusted R-squared	0.63	S.D. dependent var		266.09
F-statistic	13.91	Durbin-Watson stat		1.83
Prob (F-statistic)	0			

Source: Data Analysis; Note: \*\*\* (5% level of significance)

Table-7 has presented the fixed effects model by using panel least squares. Here the R-squared value of 0.68 indicates 68% variation in the dependent variable by the independent variables. Then adjusted R-squared value 0.63 indicates that the model has a good fit. The mean value of the dependent variable is 173.77 and the standard deviation of the dependent variable is 266.09. Three criteria are 13.14, 13.64 and 13.34 respectively. They are too close. It means the model is good. Moreover, the F-statistic and Prob (F-statistic) values suggest that the model is significant. Therefore, it can be said that the fixed effects model is a right fit for the data. The Durbin-Watson stat is 1.83, which suggests some positive autocorrelation may be present in the model residuals. This model appears to be a suitable fit as it has a higher R-squared value compared to the earlier model. The coefficients of the independent variables can be interpreted as the effect of each variable on CSR while plotting all other variables constant. Final result shows that ROE and growth of TA are significantly explanatory variables of CSR.

**8.6 Effect of CSR on CFP (By using GMM:** Cragg (1983) was the first to discover the use of GMM over OLS, 2SLS. Before that Hansen and Singleton (1982) applied it to estimate nonlinear asset pricing models.

**Table-8: Effect of CSR on CFP (Generalized Method of Moments)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	172.34	296.67	0.58	0.56

ROE	-820.30	269.57	-3.04	0.0026***
TOBINQ	-1326.18	367.65	-3.61	0.0004***
LR	-10.20	234.01	-0.04	0.97
TA	12.79	52.31	0.24	0.81
SP	0.10	0.78	0.13	0.90
PE	0.08	0.27	0.31	0.75
TR	0.02	0.00	4.49	0.00***
TE	0.00	0.01	0.05	0.96
EPS	51.51	9.73	5.29	0.00***
C	-103.98	259.21	-0.40	0.69
R-squared	0.45	Mean dependent var		173.77
Adjusted R-squared	0.43	S.D. dependent var		266.09
Durbin-Watson stat	1.22	J-statistic		9.45E-22
Instrument rank	11.00			

Source: Data Analysis; Note: \*\*\* (5% level of significance)

Table- 8 exhibited the output of GMM analysis and suggested that ROE, TOBINQ, TR, and EPS are statistically significant determinants of CSR, with negative coefficients for ROE and TOBINQ, and positive coefficients for TR and EPS. The other independent variables (ROA, LR, TA, SP and PE) appear to be statistically insignificant ( $p > 0.05$ ). The R-squared value (0.45) indicates about 45% of the variation in CSR, and the adjusted R-squared value (0.43) concludes that the model may have some over-fitting. The mean is 173.77, and the standard deviation is 266.09. The Durbin-Watson figure (1.22) suggests that there might have some positive autocorrelation in the residuals. And the J-statistic of 9.45E-22 indicates that the over identification test is statistically significant implying that the instrument set is valid. Finally, the instrument rank of 11 indicates that there are 11 instruments used in the regression.

**8.7 Effect of CSR on CFP (By using DGMM):** As the study used panel data lag effect should be taken into account to determine the effect of studied organizations' financial performance on the CSR of next year (Chowdhury et al., 2017). The dynamic GMM model proposed by Arellano and Bond (1991) and Hansen (1982) for balanced panel data. The outcome of DGMM are as follows:

**Table-9: GMM Method with Dynamic Panel Regression**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGS ROA	-3162.34	1596.60	-1.98	0.0487***
LGS ROE	-499.55	333.52	-1.50	0.14
LGS TOBINQ	-1175.54	401.36	-2.93	0.0037***
LGS LR	-200.02	265.82	-0.75	0.45
LGS TA	91.24	64.54	1.41	0.16
LGS SP	-0.02	0.85	-0.02	0.98
LGS PE	-0.03	0.28	-0.10	0.92
LGS TR	0.02	0.00	3.50	0.0005***
LGS TE	0.00	0.01	0.34	0.73
LGS EPS	56.16	10.91	5.15	0.00***
C	-491.79	320.95	-1.53	0.13
R-squared	0.43	Mean dependent var		185.97

Source: Data Analysis; Note: \*\*\* (5% level of significance)

Table-9 clearly shows that ROA, TobinQ, TR and EPS are significantly affecting the CSR activities of the banks. ROA and TobinQ significantly ( $p < 0.05$ ) affect CSR negatively while TR and EPS significantly ( $p < 0.05$ ) affect CSR positively. The model explained 43% (R-squared value) of CSR but the Durbin-Watson value is 1.18 which indicates there is no autocorrelation and the model is fit. That means the previous year's financial performance (ROA, TobinQ, TR and EPS) has a great role on CSR expenditure of the studied banks.

**9. Test of Hypotheses: From the forgoing analysis the researcher attempted to test the hypotheses here:**

**Hypothesis-1.1: Return on Assets (ROA) positive impact on CSR:** Correlation matrix showed that co-efficient of ROA with CSR is 0.04, the OLS showed that the p-value of ROA is 0.56 (insignificant) which is also seen in random effect where p-value is 0.44 (insignificant) and also in the fixed effect it is insignificant ( $p = 0.40$ ). The p-value of ROA under both GMM test and 2SLS analysis is insignificant ( $p = 0.56$ ). Therefore it can be concluded that ROA is not a determinant of CSR. The result is in the line of the study ((Setiawan et al., 2020; Resmi et al., 2018).

**Hypothesis-1.2: ROE has a positive impact on CSR:** Correlation matrix showed that co-efficient of ROE with CSR is 0.05, the OLS showed that the p-value of ROE is 0.0026 which is highly significant. It means that an increase on ROE imbues the volume CSR. The p-values of ROE under random effect and fixed effect are 0.02 (significant) and



0.05(significant) respectively. Therefore ROE is an important determinant of CSR. The p-value of ROE under GMM test and 2SLS analysis is very significant ( $p=0.0026$ ). Therefore it proved that ROE in all aspects is a significant variable or factor of CSR. It signifies to us that an increase of ROE brings the increase of CSR significantly. The finding is in the line of research findings Bowman & Hair (1975), Bragdon & Martin (1971).

**Hypothesis-1.3: TobinQ ratio is an important instrument of CSR:** Correlation matrix showed that co-efficient of TobinQ with CSR is - 0.08, the OLS showed that the p-value of TobinQ is 0.0004 which is highly significant ( $p<0.05$ ). It means that a decrease on TobinQ imbues the volume CSR and vice-versa. The p-values of TobinQ under random effect and fixed effect are 0.09 (insignificant) and 0.28 (insignificant) respectively. Therefore, TobinQ is not an important determinant of CSR. However, p-value of TobinQ under GMM test and 2SLS analysis is very significant ( $p\leq 0.05$ ). Therefore it is proved that TobinQ under both random effect and fixed effect models is an insignificant variable of CSR but under GMM and 2SLS methods it is identified as an important determinant of CSR. Finally it may be concluded that an increase in TobinQ causes the decrease of CSR and vice-versa significantly. This finding is parallel to the findings of Yusoff and Alhaji (2012).

**Hypothesis-1.4: Leverage Ratio (LR) is an important determinant of CSR:** Correlation matrix showed that co-efficient of LR with CSR is 0.29, the OLS showed that the p-value of LR is 0.97 which is insignificant. It indicates that LR is not an important determinant of CSR. The p-values of LR under random effect and fixed effect are 0.80 (insignificant) and 0.95 (insignificant) respectively. Therefore, LR has no significant role in CSR. The p-value of LR under GMM test and 2SLS analysis is not significant ( $p=0.97$ ). Therefore, it proved that LR in all aspects is an insignificant variable or factor of CSR. It denotes that the change in LR does touch CSR expenditure significantly.

**Hypothesis-1.5: Volume of Total Asset (TA) has a positive impact on CSR:** The correlation matrix showed that co-efficient of TA with CSR is positive (0.43) and the OLS showed that the p-value of TA is 0.81 which is insignificant. It means that TA is not an important determinant of CSR. The p-value of TA under random effect is 0.09 (insignificant) but under fixed effect it is 0.0482 (significant). Therefore TA permanently has a significant role in CSR. That means an upsurge in TA causes an escalation in CSR. The p-value of TA under GMM test and 2SLS analysis is not significant ( $p=0.81$ ). It denotes that the change in TA has a long term effect of CSR expenditure significantly though in the short term it does not matter.

**Hypothesis-1.6: Stock Price (SP) has a positive impact on CSR expenditure:** The correlation matrix shows that co-efficient of SP with CSR is poor (0.18) and the OLS showed that the p-value of SP is 0.90 which is insignificant. It denotes that SP is not a vital determinant of CSR. The p-value of SP under random effect is 0.15 (insignificant) and under fixed effect is 0.13 (insignificant). Therefore SP has no significant role in determining CSR both in the short term and in the long term. The p-value of SP under both GMM test and 2SLS analysis is not significant ( $p=0.90$ ). It denotes that the change in SP has not a significant effect on the volume of CSR. So our hypothesis is rejected. The study supports the findings. However, Moskowitz (1971) found that the firms which do high CSR the SP becomes higher.

**Hypothesis-1.7: PE ratio has a negative impact on CSR expenditure:** The correlation matrix showed that co-efficient of PE ratio with CSR is poor negative (0.08) and the OLS showed that the p-value of PE ratio is 0.75 which is insignificant. It means that though initially PE is negatively related with CSR but under pooled OLS it not true. The p-value of PE ratio under random effect is 0.63 (insignificant) and under fixed effect is 0.62 (insignificant). Therefore PE ratio has no significant role in determining CSR both in the short term and in the long term. The p-value of PE ratio under both GMM test and 2SLS analysis is not significant ( $p=0.75$ ). It denotes that the change in PE ratio has no significant effect on the volume of CSR. Therefore, simply without considering any further analysis the hypothesis is accepted but finally it can be rejected statistically.

**Hypothesis-1.8: Total Revenue (TR) has a significant positive impact of CSR:** Correlation matrix showed that co-efficient of TR with CSR is 0.54 the OLS showed that the p-value of TR is 0.00 which is very important. It means that an increase in TR has a noteworthy positive effect on CSR. The p-values of TR under random effect and fixed effect are 0.034 (significant) and 0.26 (insignificant) respectively. Therefore, TR has a significant role on CSR randomly but not continuously. The p-value of TR under GMM test and 2SLS analysis is very significant ( $p=0.00$ ). Therefore, it is proved that an increase in TR has a significant increase in CSR and finally our hypothesis is accepted.

**Hypothesis-1.9: Volume of Total Expenditure (TE) has a positive impact on CSR:** The correlation matrix shows that co-efficient of TE with CSR is positive (0.51) and the OLS showed that the p-value of TE is 0.96 which is insignificant. It means that TE has no significant positive impact on CSR. The p-values of TE under random effect are 0.30 (insignificant) and under fixed effect it is 0.23 (insignificant). Therefore, TE both in short term as well as in long term has no significant effect on CSR. The p-value of TE under GMM test and 2SLS analysis is not significant ( $p=0.96$ ). It denotes that the change in TE does not bring any significant change in CSR and our hypothesis can be rejected.

**Hypothesis-1.10: Earning Per Share (EPS) has a positive impact on CSR:** The correlation matrix showed that co-efficient of EPS with CSR is positive (0.40) and the OLS showed that the p - value of EPS is 0.000 which is very significant. It means that an increase in EPS causes a significant increase of CSR. The p-values of EPS under random effect are 0.02 (significant) and under fixed effect it is 0.30 (insignificant). Therefore EPS casually has a positive impact on CSR but to some extent not continuously. The p-value of EPS under GMM test and 2SLS analysis is not significant ( $p=0.00$ ). It denotes that an increase of EPS significantly be a source of an increase of CSR expenditure. Therefore our hypothesis is accepted.

**10. Conclusion and policy implications:** The foregoing analysis and discussion reveals that the CSR expenditure of PCBs has no direction and has fluctuated during the period of study. The CSR significantly depends on banks' ROE, TR, TA, EPS and ROA. However, LR, TobinQ, SP, TE and PE are not significant determinants of CSR in the banking industry

of Bangladesh. So, finally it may be concluded that CSR largely depends on the economic performance of the PCBs in Bangladesh.

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