



## A DYNAMIC PANEL ANALYSIS OF THE FINANCIAL DETERMINANTS OF CSR IN BANGLADESHI BANKING INDUSTRY

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### ABSTRACT

*Studies on corporate social responsibility (CSR) across the world mainly focus on the impact of CSR on a firm's financial performance. However, there are hardly enough empirical evidences on the firm's financial determinants of CSR expenditure. Therefore working with panel data from Bangladeshi banking industry over a period of 2002-2011, this study aims at augmenting the financial determinants of CSR expenditures in Bangladeshi banking industry. Results from panel ARDL model for 30 private commercial banks confirm that several financial determinants including total investment, no. of branch, and no. of employees have significant long run impact on the level of bank's CSR expenditure and thereupon fulfilling firm's commitment towards the greater society as a corporate citizen.*

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**Keywords:** Corporate social responsibility (CSR), Bangladeshi banking industry, Panel ARDL.

**JEL Classification:** D21, G21, M41, L21.

### INTRODUCTION

Studies on corporate social responsibilities in various industries across the world mainly focused on the impact of CSR on company's financial performance. However, till today very little focus has been shed on the opposite phenomenon i.e. the impact of financial performance in determining the level of CSR. Argument for the first trend of studies is quite simple. If we have a positive relationship between a firm's CSR and its financial performance and the relationship is unidirectional i.e. CSR impacts firm's financial performance positively then it can be argued that the firm's CSR is nothing but a form of advertisement and public relationship activities, activities

that contributes to profit. In such cases the true essence of a firm's commitment to the society can no longer be argued. However, if the commitment of fund for CSR activities is voluntary and is not determined by the possible value or profit enhancing post-expenditure effects (even if it may cause increased profitability), then the true essence of CSR can be observed. This is how a business organization strives to become a socially responsible corporate citizen. And today perhaps most people would agree that the relationship between corporations and the society should be somewhat different than what we have seen in Wall Street, rather a corporation should look for building a long-run sustainable relationship with its stakeholders.

Hopefully corporations today are coming into their senses and in the latest UN Global Compact Accenture CEO study (2010)<sup>1</sup> ninety-three percent (93%) of all the 766 participant CEOs, from all over the world, declared sustainability as an 'important' or 'very important' factor for their organizations' future success. Ninety-six percent (96%) of the CEOs believe that sustainability issues should be fully integrated into the strategy and operations of a company (up from 72% in 2007). Moreover, 86% of CEOs see 'accurate valuation by investors of sustainability in long-term investments' as an important issue in reaching a tipping point in sustainability. Ioannis and Serafeim (2010) argued that, in many respects, the emphasis placed by firms on CSR activities has fundamentally shifted the way we think about and understand the relationship between firms, their institutional environment, and important stakeholders, such as communities, employees, suppliers, national governments and the global society. Therefore it is of no wonder that, corporations tomorrow will define their roles in the greater society in a different context which will provide a win-win agenda for achieving sustainable growth and development.

With regard to CRS in banking corporations, some countries already have the provisions that require heavy penalties on banks for violating social-economic principles. For instance, US Comprehensive Environmental Response Compensation and Liability Act in late 1980s resulted in the huge loss of the banks in the US for the environmental pollution and the law made them pay the remediation cost. With the exponential growth of information technology there is a greater demand for adoption of CSR activities in banking sector and banking industry around the globe which is showing a good commitment towards CSR principles. Decker (2004) pointed out that banks have exhibited conscious efforts to comply with the relevant provisions to reduce the regulatory action by depicting a good environmental citizen image. Today throughout the globe banking sector is under massive pressure from its shareholders, investors, media, NGOs as well as its customers to carry out business in a responsible and ethical manner (Jeucken, 2001; Bhattacharya *et al.*, 2004; Jeucken, 2004; Frenz., 2005). Therefore, most of the literature in the academic world has found an increasing expenditure on CSR by the banking industry. Moreover recent studies also confirm that

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<sup>1</sup>A New Era of Sustainability: UN Global Compact-Accenture CEO Study 2010. Accessed on 26<sup>th</sup> Oct 2012 from [http://www.unglobalcompact.org/docs/news\\_events/8.1/UNGC\\_Accenture\\_CEO\\_Study\\_2010.pdf](http://www.unglobalcompact.org/docs/news_events/8.1/UNGC_Accenture_CEO_Study_2010.pdf)

there are positive financial outcomes of such expenditures. Of late banking corporations in Bangladesh have come to realize this win-win strategy for sustainability and growth. For example, the reform in Bangladeshi financial sector in the mid 1990s was not only a reform of regulations but also a holistic reform to give financial sector an opportunity for serving the economy and unleashing the fullest potential and commitment for the socio-economic development of Bangladesh. Therefore in a country with corporate culture historically characterized by insufficient payment structure for employees, corruption in recruitment and promotion process, unethical corporate practices etc., banking sector in its' dealings with greater stakeholders has been leading from the front to change itself into a more responsible corporate citizen. The result has been a significant increase in CSR expenditure in the banking industry over the last decade. The question is what are the corporate related characteristics those have driven this growth in CSR expenditure in the banking sector? A panel study from 30 commercial banks over the period of 2002-2011 identifies some important short term and long term corporate financial determinants for the growth in CSR expenditure in the banking industry of Bangladesh in the last decade.

## LITERATURE REVIEW OF CORPORATE SOCIAL RESPONSIBILITY

[Azim et al. \(2011\)](#) argued that corporate social responsibility is not the only ethical predicament that financial institutions face in an atmosphere of corrupt corporate practice but these institutions are also concerned with commitment for sustainable development. The study of [Shirley \(2011\)](#) with data from Hong-Kong banking industry concluded that management of a banking organization should put in place an appropriate policy for establishing positive organizational culture and socially responsible approach amongst the staff members. If commitment for becoming a socially responsible banking organization among board members, management and staffs is present while corporate accountability and creditability can be demonstrated through effective and efficient internal audit, customers and the community will be benefited with reduced risks and enhanced quality. According to numerous studies including ([Moskowitz, 1972](#); [Parert and Eibert, 1975](#)) and [Soloman and K. \(1985\)](#), the explicit costs of CSR are minimal. Moreover firms may actually benefit from socially responsible actions in terms of employee morale and high productivity. Additionally [Alexander and Bucholtz \(1978\)](#) and [Bowman and Haire \(1975\)](#) have suggested that stakeholders at large and stock and bondholders in particular may see CSR as an indication of management skills.

[Jean \(1988\)](#) using *Fortune* magazine's ratings of corporate reputations suggested that compared to firms with high social responsibility ratings firms with low social responsibility ratings experience lower return on assets (ROA) as well as lower stock market returns. However, the opposite may also be true that firms with high performance and low risk may be better able to act in a socially responsible manner. Investigating about the current theory concerning the effects of CSR on corporate financial performance provides an unclear conclusion (e.g., ([Waddock and Graves, 1997](#);

Guenster *et al.*, 2006). For example arguments for a negative influence of CSR on profitability can be based on neoclassical microeconomics. This view mainly emphasizes that the operating costs of corporate environmental (e.g., Telle (2006) or social activities reduces their financial benefits due to cost increase through energy savings technology, waste reduction, or recycling in such a way that the underlying principle of shareholder's wealth is hurt. It is argued that CSR demands significant portions of corporate financial resources, although the benefits of CSR are often in a distant future, if any benefit really occurs. Therefore CSR can lead to reduced profits, decreased firm values, or competitive disadvantage besides lower shareholder returns. Thus Friedman (1970) argues that there is no role for CSR in the corporation. Kenneth *et al.* (1985) using an elaborate and forced choice instrument administered to corporate CEOs did not find any relationship between social responsibility and profitability. In fact varying levels of social orientation were not found to correlate with performance differences.

In contrast to these findings, one of the earliest literatures focusing on profit enhancing role of CSR i.e. Sturdivant and Ginter (1977) urged that social responsibilities have a positive impact on companies' earnings per Share (EPS). Vance (1975) compared 14 firms those had been identified as socially responsive by Moskowitz (1972) and urged that there is neutral or average positive correlation between the social responsiveness and EPS in stock market. Later on many researches like (Pava and Krausz, 1996; Preston and Bannon, 1997) have also found positive correlation between CSR and financial performance. Moreover, Hopkins and Cowe (2003) and Ian (2005) have also proved a negative impact of socially irresponsible operation on share prices and brand reputation of a bank. Recently Hoje and Maretno (2011) supporting the conflict-resolution as opposed to the over-investment suggests that CSR engagement positively affects firm value after correcting for the endogenous treatment effect. They also recommended that CSR concentration (after the firm decided to engage in CSR) is also influenced by internal and external corporate governance and monitoring systems and firm characteristics.

Azim *et al.* (2011) using data set from ten private commercial banks in Bangladesh concluded that CSR has an influence on market price per share. The study suggested that the selected banks should increase investment in CSR activities to a significant extent in order to create more confidence among the existing clients as well as prospective customers and on the other hand increase MPS of the banks. Moreover Faris *et al.* (2012) using annual reports of 60 industrial companies listed on the Amman Stock Exchange for a period from 2006 to 2010 concluded that larger size and aging firms, maintaining growth and are highly leveraged are more likely to voluntarily disclose social responsibility information. Their findings are consistent with the agency and political economy theories. The review of the above literatures clearly highlight that there is a serious research gap. As mentioned earlier most of the literatures except Faris *et al.* (2012) have focused on the profit enhancing role of CSR expenditure while completely ignoring the determinants of CSR in a particular corporation. Moreover these earlier studies have used several outdated methodologies.

Most of these methodologies have serious drawback in their ability to conclude about time series or cross sectional data. Therefore, the study uses panel data from Bangladeshi banking industry to bridge the research gap i.e. identify the long-run and short-run financial determinants of CSR expenditure.

### **CSR in Bangladeshi Banking**

The commercial banking sector of Bangladesh dominates its financial sector. There are 53 banks in Bangladesh of which 30 are private commercial banks (PCBs), 4 are nationalized commercial banks (NCBs), 10 are foreign banks, and 9 are developments banks. Out of these 53 banks, 44 banks are involved in CSR activities. In fact, the banking sector of Bangladesh has a long history of involvement in benevolent activities like providing donations to different charitable organizations, poor people and religious institutions, city beautification projects and patronizing art & culture, sports and education etc. These activities constitute the primary basis of corporate social responsibility (CSR) for banking industry in Bangladesh. Moreover, over the last decade banks have gradually organized their involvements in more structured CSR initiatives with guidelines of BB (BB report 2009<sup>2</sup>) especially from the year of 2006. Dutch-Bangla Bank, Prime Bank, Brac Bank, and Southeast Bank are the first few banks to adopt of the concept of CSR in the Banking industry of Bangladesh.

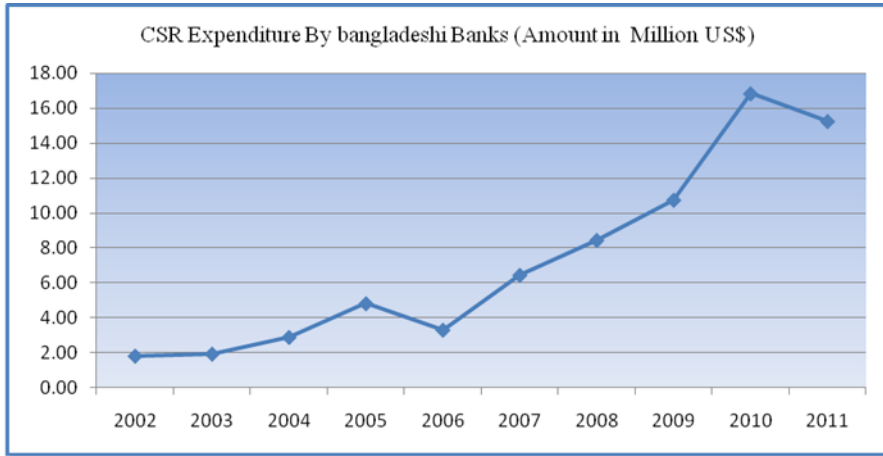
Since CSR is rapidly gaining its global acceptance as a standard of socially equitable business practices, the role of business worldwide has evolved from classical 'profit maximizing' approach to a 'socially responsible' approach, where a broader and inclusive sense suggests that businesses should not only be responsible to their stockholders but also to their stakeholders at large.

In 2011, the aggregate CSR expenditure of all the scheduled banks totaled Tk. 3.32 billion, a five-fold increase compared to the CSR expenditure of 2009. The highest expenditure in this connection was in the healthcare sector, followed by disaster, relief and education. Health sector expenditure comprised financial contributions to hospitals, clinics and other facilities, run by external organizations. Besides, some banks are running their own non-profit hospitals and diagnostics establishments. Banks are also helping the mentally and physically disabled people of the society through their various CSR programmes.

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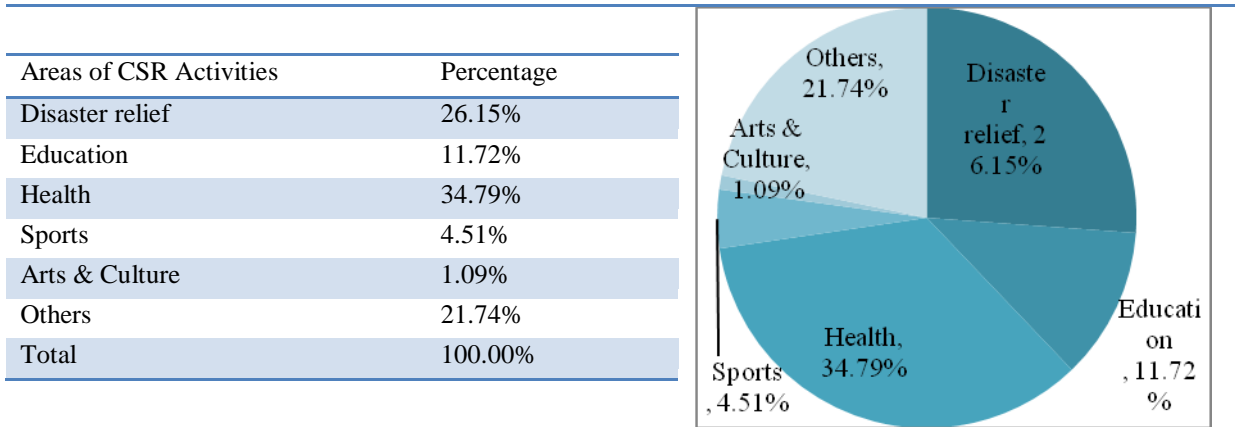
<sup>2</sup> Bangladesh Bank report (2009). Review of CSR initiative in Banks (2008-2009). Accessed from <http://www.bangladesh-bank.org/pub/annual/csr/csr0809.pdf>.

**Figure-1.** CSR expenditure by Bangladesh Banks over the year (Amount in Million US\$)



It is therefore encouraging that CSR activities of banks in Bangladesh have now increased (*figure 01*). And more importantly deepened and broadened substantially in various areas of activities (*figure 02*).

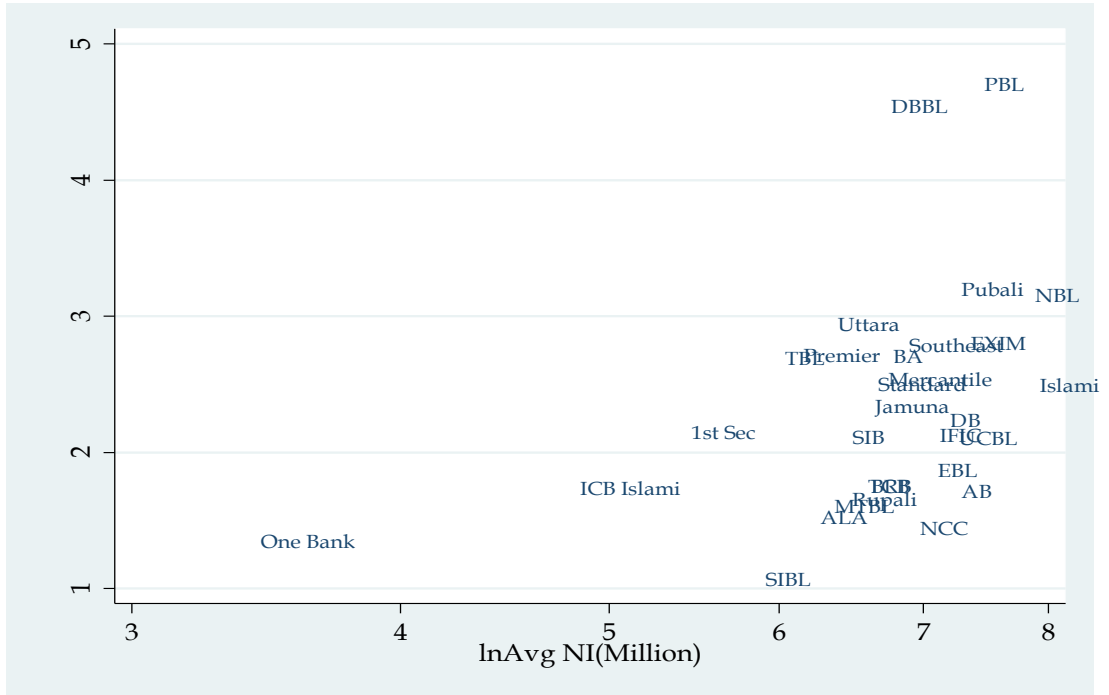
**Figure-2.** Areas of CSR Actives by Bangladeshi Banking Industry



It is worth mentioning that some of the CSR activities of these banks are really praiseworthy. For example Dutch-Bangla Bank has established a tradition of awarding scholarships to physically disabled, poor and meritorious students who passed competitive exams in various levels. The bank has arranged free surgical operations for children and adolescents with clubfeet and plastic surgery operation camps under its smile-brighter program. Standard Bank is serving people by setting up temporary eye treatment project and donating cheques to 20 war-wounded freedom fighters over the years. HSBC has been providing scholarships to 30 blind students over the past five years up to 2010 and the number has increased to 50 in 2011. BRAC Bank is providing financial assistance for treatment and education of hearing-impaired poor people. It is also supporting the leading school of autistic children for building awareness about autism. Besides, it has provided educational

materials to around 300 underprivileged children with multiple disabilities. Figure 03 in the previous page presents the comparative positions of various banks in Bangladeshi banking industry over last one decade (2002-2011) in respect to their respective CSR expenditure.

**Figure-3.** Comparative position PCBs in Bangladesh in respect of CSR expenditure



Apart from these various forms of CSR contributions of the banking industry to the public, the industry is also the highest contributor in the public exchequer in the form of corporate tax at the rate of 42.50% of their operating profit. All of these are sign of optimism that the banking industry would further extend and broaden its activities in the coming days on humanitarian grounds, and thus help the disabled segment of the population.

### CSR Practice Area in PCBS of Bangladesh

Alam *et al.* (2010) argued that the most common CSR practices in Bangladesh by different organization are centered mainly on poverty alleviation, healthcare, education, charity activities, cultural enrichment, youth development, women empowerment, patronizing sports, and music etc. Government sponsored Management and Resources Development Initiative (MRDI) reviewed the SRO (statutory regulatory order) No. 270-Ain/2010, dated 01.07.2010 that provides 22 areas of CSR activities for enjoying 10% tax rebate. However, Alam *et al.* (2010) study identified that out of these 22 areas of CSR expenditures most of the bank’s participation are limited to around 10 to 13 areas only.

**Table-1.** Areas of CSR Activities in Bangladesh

<i>No.</i>	<i>Areas of CSR activities in Bangladesh</i>
01	Donation to organizations engaged in clean water management
02	Donations to organization engaged in forestation
03	Donations to organization engaged in beautifications of cities
04	Donations to organization engaged in waste management
05	Donations for redressing the hardships caused by natural calamities such as cyclone, earthquake, tidal wave and flood challenged through Government organizations
06	Donations to organizations engaged in establishment and management and management of old persons homes
07	Donations to organizations engaged in the welfare of mentally or physically handicapped
08	Donations to educational institutions run for the purpose of education of rootless children
09	Donations to organizations engaged in projects on accommodation for the slum dwellers
10	Donations to social organizations engaged in publicity of movements relating to women's rights and anti-dowry practices
11	Donations to organizations engaged in feeding and clothing and sheltering and rehabilitation of orphan/rootless children
12	Donations to organizations engaged in research on independence war, regaining and expansion of the consciousness of the independence war and the act of honorable living of the freedom fighters
13	Donations to organizations engaged in health some situation in Chittagong Hill Tracts, <i>char</i> areas and areas surrounding breaking up of bank of river
14	Grants to organizations engaged in treating cleft lips, cataract, cancer, and leprosy
15	Grants the organizations engaged in treating acid victims
16	Donations to hospitals engaged in providing free medical treatment to poor patients and specialized for developing the quality of treatment, such as cancer, liver, kidney, thalassemia, eye and cardio
17	Donations to organizations distributing freely at the level of use of birth –control products with a view to solving the population problem and to conduct camps for voluntary sterilization
18	Grants to Public Universities
19	Expenditure incurred through educational institutions recognized by Government for providing technical and vocational education for meritorious poor students
20	Money invested in establishing lab for providing training on computer or information technology and in establishing infrastructure or in purchasing educational materials for implementing English education in public /private educational institutions (under Monthly Pay Order or MPO)
21	Donations to organizations engaged in providing technical and vocational training to unskilled or semi-skilled labor for export of human resources
22	Donations to organizations involved with infrastructure of sports and provision of training at national level.

## DATA AND METHODOLOGY

As mentioned earlier there are 53 banks in Bangladesh of which 30 are private commercial banks (PCBs), 4 are nationalized commercial banks (NCBs), 10 are foreign banks, and 9 are developments banks. Additional to these numbers, recently another four banks have got license to commence in the Bangladeshi market as 4<sup>th</sup> generation banks. Out of these 53 banks, 44 are involved in CSR activities.

Though the oldest PCB in Bangladesh has been in operation for about 30 years, however, this study used a 10 years window of analysis from 2001 to 2010 primarily because CSR initiatives are a new phenomenon in banking industry. Thus out of 44 banks population, a total of 30 local private



commercial banks (68.14%) were chosen as the sample for this study. The sample excludes public commercial banks, foreign banks and investment banks. This is due to their different nature of ownership, operating guidelines and other regulatory differences. Most of the data have been collected from the banks' annual report and in some case missing data have been retrieved from IPO prospectus of these respective banks and from DSE (Dhaka Stock Exchange) library. Thus the data includes 30 banks over 10 years of observation, making it a completely balanced panel data. Size differences in the value of the observations across cross section and over time period has been normalized with logarithmic transformation.

As per the variables are concerned, the present study employed a host of financial variables from banking industries in Bangladesh based on earlier empirical studies on the financial determinants of CSR in different industries including financial service industries from across the world. The variables includes *CSR expenditure amount*, *investment (inv)*, *Asset (ass)*, *promotional Expenditure (proexp)*, *interest income (intinc)*, *total deposit (totald)*, *no. of branch (bran)*, *number of employees (emp) etc.*

**Panel Unit Root Test**

Before moving forward for the estimation process first of all it is necessary to determine the existence of unit roots in the data series. The study has primarily used [Im et al. \(2003\)](#) methodology for testing unit root in the data series. This methodology is based on well-known ADF procedure of [Dickey and Fuller \(1979\)](#).

[Im et al. \(2003\)](#) proposed a test to investigate the presence of unit roots in panels that combines information from the time series dimension as well as from the cross section dimension in such a way that fewer time observations are required for the test to have power. The test has been found to have superior test power to analyze long-run relationships in panel data. [Im et al. \(2003\)](#) begin by specifying a separate ADF regression for each cross-section with individual effects and no time trend:

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t-j} + \varepsilon_{it} \dots\dots\dots(01)$$

Where,  $i = 1, \dots, N$  and  $t = 1, \dots, T$

[Im et al. \(2003\)](#) used separate unit root tests for the  $N$  cross-section units. Their test is based on the Augmented Dickey-fuller (ADF) statistics averaged across groups. After estimating the separate ADF regressions, the average of the  $t$ -statistics for  $p_1$  has been calculated from the individual ADF

regressions,  $t_{iT_1}(p_i)$ :

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^N t_{iT}(p_i \beta_i) \dots\dots\dots(02)$$

The *t*-bar is then standardized and it is shown that the standardized *t*-bar statistic converges to the standard normal distribution as N and T → ∞. Im et al. (2003) showed that *t*-bar test has better performance when N and T are small. They proposed a cross-sectionally demeaned version of both test to be used in the case where the errors in different regressions contain a common time-specific component. Additionally the study has performed other unit root test used for both common & individual unit root process as suggested by Levin et al. (2002), and Breitung (2000).

**The MG, PMG and DFE Approach**

In a panel data specification, Eq. (3) is nested in an ARDL (autoregressive distributed lag) specification to allow for rich dynamics in a way that stock market growth adjusts to the change in macroeconomic and stock market related operating variables those enters into the equation. The ARDL (p, q... q) model where the dependent and independent variables enter the right-hand side with lags of order p and q, respectively, can be written as:

$$y_{it} = \mu_i + \sum_{j=1}^p \lambda_{ij} y_{it-j} + \sum_{j=0}^q \delta'_{ij} x_{it-j} + \varepsilon_{it} \dots\dots\dots(03)$$

Where, *i* = 1, 2,....., N represents country, *t* = 1, 2, 3, .....T represent time (annual), *j* is the number of time lag, *y<sub>it</sub>* = CSR expenditure<sub>*it*</sub>, *x<sub>it</sub>* = dependent variables like *inv<sub>it</sub>*, *ass<sub>it</sub>*, *proe<sub>it</sub>* etc and finally *μ<sub>i</sub>* is the fixed effect. By re-parameterization, the above equation can be written as:

$$\Delta y_{it} = \mu_i + \phi_i y_{it-1} + \beta'_i x_{it} + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{it-j} + \sum_{j=0}^{q-1} \delta'_{ij} \Delta x_{it-j} + \varepsilon_{it} \dots\dots\dots(04)$$

where,

$$\phi_i = -1(1 - \sum_{j=1}^p \lambda_{ij}), \beta_i = \sum_{j=0}^p \delta_{ij}$$

$$\lambda_{ij}^* = - \sum_{m=j+1}^p \lambda_{im}, j=1,2,\dots,p-1, \text{ and}$$

$$\delta_{ij}^* = - \sum_{m=j+1}^p \delta_{im}, j=1,2,\dots,q-1.$$

Now by grouping the variables in levels further, Eq. (4) is rewritten as an error correction equation:

$$\Delta y_{it} = \mu_i + \phi_i (y_{it-1} - \theta'_i x_{it}) + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{it-j} + \sum_{j=0}^{q-1} \delta'_{ij} \Delta x_{it-j} + \varepsilon_{it} \dots\dots\dots(05)$$

Where  $\theta_i = -(\beta_i/\phi_i)$  defines the long-run or equilibrium relationship among  $y_{it}$  and  $x_{it}$ . In contrast  $\lambda_{ij}^s$  and  $\delta_{ij}^{st}$  are short run coefficients relating CSR expenditure to its past values and other determinants like  $x_{it}$ . Finally, the error-correction coefficient  $\phi_i$  measures the speed of adjustment of  $y_{it}$  toward its long-run equilibrium following a change in  $x_{it}$ . The condition  $\phi_i < 0$  ensures that a long-run relationship exists. Therefore, a significant and negative value of  $\phi_i$  is treated as an evidence of cointegration between  $y_{it}$  and  $x_{it}$ . Kim *et al.* (2010) suggested that there are a few existing procedures for estimating the above model and at one extreme, the simple pooled estimator assumes the fully homogeneous-coefficient model in which all slope and intercept parameters are restricted to be identical across countries. While on the other extreme, the fully heterogeneous-coefficient model imposes no cross banking firm coefficients constraints and can be estimated on a firm-by-firm basis. This is the mean group (MG) estimator introduced by Pesaran and Smith (1995). The approach estimates separate ARDL regressions for each group and obtains  $\theta$  and  $\phi$  as simple averages of individual group coefficients  $\theta_i$  and  $\phi_i$ . In particular, Pesaran and Smith (1995) showed that the MG estimator will provide consistent estimates of the average of parameters interested.

However, there is another methodology i.e. the dynamic fixed-effect (DFE) method that allows the intercepts to differ across groups, but imposes homogeneity of all slope coefficients and error variances. Under slope heterogeneity, Pesaran and Smith (1995) point out that the DFE estimates are affected by a potentially serious heterogeneity bias, especially in small firm samples. As an alternative, Pesaran *et al.* (1999) propose the Pooled Mean Group (PMG) estimator which restricts the long-run parameters to be identical over the cross section, but allows the intercepts, short-run coefficients (including the speed of adjustment), and error variances to differ across groups on the cross section. If the long-run homogeneity restrictions are valid, it is known that MG estimates will be inefficient. Thus Pesaran *et al.* (1999) developed the maximum likelihood-based PMG approach which yields a more efficient estimator. As shown in Pesaran *et al.* (1999), the validity of a cross-sectional, long-run homogeneity restriction of the form  $\theta_i = \theta$ ,  $i=1, 2, \dots, N$  and hence the suitability of the PMG estimator can be tested by a standard Hausman-type statistic. Thus generally Hausman (1978) test has been used to identify the relative choice among the MG, PMG and DFE methods.

### Analysis and Findings

Regarding the test of stationarity, it may be mentioned that, such a test is very important since financial time series data are considered non-stationary i.e. they follow unit root. Nelson and Plosser (1982) led a large volume of literature investigating possible non-stationarity of financial time series data. Thus before proceeding with ARDL MG, PMG or DFE model, the test for the stationarity status of the variables have been performed in order to determine the respective order of integration of the variables under consideration. It is also important because according to Pesaran and Pesaran (1997) if the variables are I(2) stationary then it will generate spurious result.

Thus a host of test has been performed to check for the I (\*) so that the methodology can be applied. The result has been produced in table 02.

**Table-2.** Result from Panel unit root test (with individual intercept and no trend under first difference).

Variables	Assumes common unit root process	Assumes individual unit root process		
	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
<i>csr</i>	-5.89***	-3.70***	115.25***	303.03***
<i>inv</i>	-18.47***	-4.87***	127.97**	238.33**
<i>ass</i>	-8.29***	-2.72***	107.18***	200.84***
<i>proe</i>	-10.31***	-5.15***	134.95***	200.29***
<i>intinc</i>	-2.93***	-1.04	90.18**	165.47***
<i>totald</i>	-27.97***	-9.90***	135.00***	208.46***
<i>bran</i>	-5.66***	-6.76***	128.35***	181.82***
<i>emp</i>	-23.87***	-7.32***	136.23***	236.36***

\* Indicates that variables are stationary at 1% significance level

Moreover, to examine the long-run effect of financial characteristics of the banking firm on their CSR expenditure the following cross sectional regression has been estimated:

$$csr_{it} = \alpha + \beta' financial\ characteristics_{it} + \varepsilon_{it} \dots\dots\dots(06)$$

Where *financial characteristics<sub>it</sub>* represent a wide variety of variables listed in the data and methodology section. In fact the study has identified following functional form for *financial characteristics<sub>it</sub>*:

$$financial\ characteristics_{it} = f(inv_{it}, ass_{it}, proe_{it}, intinc_{it}, totald_{it}, bran_{it}, emp_{it}) \dots\dots\dots(07)$$

Following the conceptual background, the study has initially investigated the relationship between CSR expenditure and financial characteristics of the cross sectional banks. For this the study employed simple OLS as well as panel OLS with random effect (RE) and fixed effect (FE) alternatives.

Thus the following models have been developed:

$$csr_{it} = \alpha_i + \zeta_1 inv_{it} + \zeta_2 ass_{it} + \zeta_3 proe_{it} + \zeta_4 intinc_{it} + \zeta_5 totald_{it} + \zeta_6 bran_{it} + \zeta_7 emp_{it} + \delta_{it} \dots\dots\dots(08)$$

$$csr_{it} = \alpha_i + \zeta_1 inv_{it} + \zeta_2 ass_{it} + \zeta_3 proe_{it} + \zeta_4 intinc_{it} + \zeta_5 totald_{it} + \zeta_6 bran_{it} + \zeta_7 emp_{it} + v_{it} + \delta_{it} \dots\dots\dots(09)$$

Moreover, following the (Pesaran and Smith, 1995; Pesaran *et al.*, 1999) MG, PMG, and DFE methodology as presented in equation 05, the following error-correction model has been estimated

to uncover the long- and short-run consequences of financial characteristics on the level of CSR expenditure in the Bangladeshi Banking industry.

$$\begin{aligned} \Delta csr_{it} = & -\mu_i + \phi_i (csr_{i,t-1} - \lambda_1 inv_{i,t-1} - \lambda_2 ass_{i,t-1} - \lambda_3 proe_{i,t-1} - \lambda_4 intinc_{i,t-1} - \lambda_5 totald_{i,t-1} - \lambda_6 bran_{i,t-1} - \lambda_7 emp_{i,t-1}) \\ & + \sum_{j=1}^{p-1} \gamma_j^i \Delta (csr_{i,t-j}) + \sum_{j=0}^{q-1} \delta_1^i \Delta inv_{i,t-j} + \sum_{j=0}^{q-1} \delta_2^i \Delta ass_{i,t-j} + \sum_{j=0}^{q-1} \delta_3^i \Delta proe_{i,t-j} + \sum_{j=0}^{q-1} \delta_4^i \Delta intinc_{i,t-j} \\ & + \sum_{j=0}^{q-1} \delta_5^i \Delta totald_{i,t-j} + \sum_{j=0}^{q-1} \delta_6^i \Delta bran_{i,t-j} + \sum_{j=0}^{q-1} \delta_7^i \Delta emp_{i,t-j} + \varepsilon_{i,t} \dots\dots\dots(10) \end{aligned}$$

Where  $csr_{it}$  is the dependent variable and the remaining variables are financial characteristics of cross sectional banks i.e. the regressand. Following Loayza and Ranciere (2006) the study imposes a common lag structure across banks rather than using some consistent information criteria (e.g., Schwartz Bayesian criterion) due to the limitation of the data. The existence of a long-run relationship between CSR expenditure and financial characteristics variables of banks require that the error-correction coefficient i.e.  $\phi^i$  is negative and significant and not smaller than -2. In addition, the coefficients of  $\lambda_i$ s denote corresponding long-run elasticity and are constrained to be the same across banks. The long-run impacts of financial characteristics variables of banks on CSR expenditure can be examined based on the significance of  $\beta_i$ s while short-run impacts of the dependent variables are observed if the first-differenced variables are significant.

As mentioned earlier the study has employed 7 different types of financial characteristics variables for each cross-sectional bank. It may be mentioned that some other variable like management expenditure, net income, interest expense, non-interest income, non-interest expense, availability of ATM booth etc has also been used to see their impact in the primary period of construction an appropriate model. However, due to multicollinearity variables like management expenditure, interest exp and some other variables have been removed from the model. Moreover, to obtain short-term error correction which is statistically significant other variables like net income, non-interest income, non-interest expenses, and availability of ATM booth has been omitted from the final model.

Once everything is set for exploring the long run and short run relationship nature of the financial determinants of CSR expenditure, the study followed two distinct paths. Thus before moving on to the more assured models like MG, PMG, and DFE, at first the study has employed the simple panel OLS as well as fixed effect (FE) and random effect (RE) models. The result of the OLS, FE and RE has been provided bellow in table 03.

The result represents the long run coefficient of the OLS with no consideration of the panel structure of the data and it clearly shows that 31.59% of variations in CSR expenditure by the banking industries in Bangladesh are due the financial characteristics included in the model. Amongst others variables like *inv*, *bran*, *emp* etc have been found to be highly significant in

explaining the long-term CSR expenditure of the banking companies in Bangladesh. It is interesting that almost the same result holds true in fixed and random effect model as well.

**Table-3.** The effect of financial variables on the CSR expenditure by Bangladesh banking industry.

Variables	OLS	Fixed effect	Random effect
<i>Long run coefficient</i>			
Intinc	0.0166	0.0166	0.0127
Inv	.3255***	.3255***	.2354**
Ass	0.1063	0.1063	0.1157
Proe	0.1008	0.1008	0.2069
Totald	0.0487	0.0487	0.1818
Bran	1.2969***	1.2969***	.77354***
Emp	-.9495**	-.9495**	-.6107**
$\alpha$	-1.0363	-1.0363	-2.2630*
Hausman test		0.00 ***	
R-square	0.3159		
Rho		0.597	
Cross-section random			0.6457 (0.4902)×
Period random			0.0498 (0.002)
Idiosyncratic random			0.6566 (0.5068)

× Values in the bracket represent standard deviation.

Looking further into the discussion the result from the fixed effect model suggests that 59.7% variation in CSR expenditure is accounted for the cross sectional difference as measured by the rho i.e. the interclass differences. Moreover the result shows that like the results in OLS model in FE model *inv*, *bran*, and *emp* are the three statistically significant variables determining the level of CSR expenditures by the respective banks. Since the beta coefficient of both *inv* and *bran* is positive, it indicates that larger the size of the bank in respect to investment and geographical outreach represented by number of branches, higher will be the level of CSR expenditure. Finally the random effect model shows that the average effects of *inv* and *bran* and *emp* on the CSR expenditure is statistically significant. For example considering the changes in *inv* across time and among banking companies, on an average for 1% change in *inv* generate a statistically significant 23.33% change in CSR expenditure. Moreover, the study found a period random rho of 4.98, the estimates cross sectional random is 64.57 and the estimates of idiosyncratic random is 65.66. This means that the variance of time effect is 0.2% of the total variance, while the variance of the firm effect is 49.02% of the total variance and the variance of the remainder effect is 50.68% of the total variance. It is interesting to note that in all these three models *emp* has a negative beta coefficient. Thus it means higher the number of employees lower the level of CSR expenditure by the firm. The economic intuition of such findings is neither supported nor nullified by empirical studies. However it is unclear whether these banks with larger employee size idolizes a concept that recruiting more employees in itself is a socially responsible work as it promotes employment in the society.

Finally, the result from the Hausman test suggests that neither fixed nor random model is superior to one another. But the result from joint test for all-year coefficient has a value of  $F(9,254) = 6.03^{***}$ . Therefore, the test can reject the null that all years coefficients are jointly equal to zero, that indicates a need for time-fixed effects in the model. However, the Breusch-Pagan Lagrange multiplier (LM) test result of  $\chi^2(1) = 187.20$  ( $Prob > \chi^2 = 0.000$ ) suggest that such a null hypothesis can be rejected and finally it can be concluded that random effects rather than fixed effect model is an appropriate model.

After analyzing the effectiveness of fixed and random effect model in explaining the CSR expenditure, dynamic panel models have also been used. The following table 04 reports MG, and DFE estimates and specification tests of equation (10). Before moving further it may be mentioned that the PMG could not be estimated since there are only 10 years data, which is not sufficient to see a long run relationship under PMG methodology. Thus the study focuses on discovering the short run and long run effect based on MG and DFE models only. Now, the result of such analysis presented in table 04, indicates that the error-correction coefficient  $\phi_i$  is negative and significant and fall within the dynamically stable range for MG and DFE estimators. This indicates that there exists a long-run relationship between CSR expenditure of firm and its financial characteristics. Moreover, this also gives evidences of mean reversion to a non-spurious long-run relationship and therefore stationary residuals, meaning that CSR expenditure and banks financial characteristics are cointegrated. Moreover, a higher average  $\lambda_i$ 's imply greater adjustment process towards the long run equilibrium CSR expenditure.

Regarding the long-run coefficient, there is significant difference between the MG, and DFE models. The MG estimate tends to be different from the DFE estimate. Moreover there are more statistically significant explanatory variables in DFE model than in MG model. For example in MG methodology out of 7 explanatory variables none of the variables is individually statistically significant, however, their joint effects are. But in DFE model out of 7 financial characteristic of the banks three variable *inv*, *bran*, and *emp* have been found to be statistically significant in the long term. In DFE model *inv* and *bran* has been found to have a positive and statistically significant long term effect on the CSR expenditure, while *emp* size has been found to have a negative and statistically significant long term effect on CSR expenditure. Interestingly the result is almost identical to the FE and RE models except the effect of *bran*.

Under DFE method investment (*inv*) has been found to have significant positive long term effect on CSR expenditure by banking industries in Bangladesh. In reality a 1% increase in *inv* has 0.4449% positive contribution to the growth of CSR expenditure.

**Table-4.** The effect of financial variables on the CSR expenditure by Bangladesh banking industry.

Variables	Model (mean group)	Model (dynamic fixed effect)
<i>Long run coefficient</i>		
<i>intinc</i>	-0.1350	0.2408
<i>inv</i>	0.9689	0.4777**
<i>ass</i>	-0.7818	0.0754
<i>proe</i>	0.5830	-0.1244
<i>totald</i>	0.1471	-0.1516
<i>bran</i>	-0.0115	1.5040**
<i>emp</i>	-0.0548	-1.1645*
<i>Error correction coefficient</i>		
<i>ec</i>	-1.2319***	-0.7319***
$\Delta$ <i>intinc</i>	-0.1724	-0.0610
$\Delta$ <i>inv</i>	-0.1949	-0.1007
$\Delta$ <i>ass</i>	0.1877	0.0667
$\Delta$ <i>proe</i>	-0.5685	0.2339
$\Delta$ <i>totald</i>	0.4102	-0.0619
$\Delta$ <i>bran</i>	0.0888	0.7034
$\Delta$ <i>emp</i>	0.3369	0.2548
$\alpha$	-6.4341	-0.5097
Hausman Test	6.17 (0.520)	

*Note:* The dependent variable is CSR. The values in the parentheses (brackets) are the standard errors (p-value) of corresponding coefficient estimates. \*\*\*, \*\*, and \* indicate significant at 1%, 5% and 10% levels, respectively.

In Bangladesh the structure of banking industry includes mostly branch banking system. The more the number of banks branches are the greater geographic area a bank can cover and thus potentially the CSR expenditure might be higher as well. This is exactly what the study has found. The result shows that there is positive and statistically significant long term relationship between numbers of branches of a bank and the level of CSR expenditure by the same bank, In fact a 1% increase in number of branches by a bank leads to 1.504% increase in CSR expenditure. Moreover, the estimated parameter of interest income (*intinc*) and total assets (*ass*) impact on CSR expenditure has been found to be positive. However, such positive coefficient could not be statistically verified. As for the short term error correction coefficient the constant ( $\alpha$ ) is not statistically significant meaning that there is no fixed effect of these variables on the growth CSR expenditures. Moreover none of the variables under both MG and DFE model has been found to have a statistically significant short run positive or negative impact on the CSR expenditures by the banks. However, the short term error correction coefficient has been found to be statistically significant and the value is negative. This indicates that there is a significant variation of CSR expenditure amongst all the 30 banks under study and the error correction forces the short run coefficient to proceed to its long run path. It is interesting to note that there is a definite difference between MG and DFE models. In fact the estimated long run coefficients of various financial characteristics variables and short term error correction coefficients under MG and DFE method are different. Precisely the rate of



adjustment or error correction is almost double in MG model than in DFE model. Thus the Hausman test to reject the long-run homogeneity restriction at conventional levels of significance concludes that DFE model is better than MG model. Moreover, certain additional statistically properties suggested by Pesaran *et al.* (1999) also indicates there preference of DFE over MG model.

## CONCLUSION

The current study has several critical findings. First, banking firms with larger size will be more CSR-minded compared to the firms with smaller size. Second, there is no existence of impact of bank's net income on CSR expenditure i.e. CSR expenditure does not necessarily has a profit increasing or performance enhancing ability. Thus an increase in CSR expenditure in Bangladeshi banking industry can be considered as a real commitment of these firms as corporate citizens to the society. Finally cross sectional difference in CSR expenditure is significant compared to the time period impact in the industry as well. Therefore, it is up to the independent bodies and regulatory authorities to pursue those banks lagging behind in the CSR expenditures to do more.

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