

## The Efficiency of Corporate Governance on Capital Structure: An Empirical Study from Listed Manufacturing Firms in Bangladesh

MOHAMMAD RAJON MEAH

### ABSTRACT

*The corporate governance factors are highly focused on the era of universal financial crisis and economic downturn led by risks mostly from weak capital structure. Corporate governance helps to assess insights about capital structure. Therefore, the present study intends to examine the efficiency of corporate governance on firm's capital structure by using the data from Dhaka Stock Exchange (DSE) listed 40 manufacturing firms covering the period of 2013-2017. The empirical results from Pooled OLS regressions intimate that larger board size, larger audit committee size and higher percentage of foreign ownership help a firm to be less levered but higher percentage of director ownership and audit committee independence put the firms to be more levered thus to be riskier. The non-monitoring role of female directors on board is also documented in the results. The study recommends to limit the shares held by the directors to a certain level and to reassess the role of female directors and independent audit committee members in the context of Bangladesh along with active enforcement.*

*Keywords: Capital structure; corporate governance; leverage; risk; short-term*

### INTRODUCTION

Capital structure is a combination of short-term debt, long-term debt, preferred equity, common equity and retained earnings those a firm uses to finance its whole operations. A firm takes several financial decisions regarding its operations but decision on capital structure is the most important one as it is rightly linked to the firm's risk and return. The concerning fact related to capital structure is the cost of capital and any rash and immature decision on it can lead to higher cost of capital which reduces the value of the firm and puts the firm in a risky situation of being default. However, an effective and optimum combination of debt and equity on capital structure can do the opposite. The valuation of a firm is highly influenced by debt-equity ratio (Welch 2004) and every firm has their own capital structure policy where they form their capital structure on different combinations of debt and equity. Some firms prefer more debt to equity while others prefer reverse. So, a firm must be effective to form its capital structure with an optimum combination of debt and equity to ensure better firm value and lower risks associated with it.

Corporate governance (CG) is now a global issue due to the globalization of the businesses and recent corporate scandals. It is aimed to protect the interests of the stakeholders related to the firms by ensuring the involvement of all parties in the well-being of the firms and to ensure that CG should be properly followed and applied to the firms. It is well known that there is no universal set of CG principles that can be generally applied to firms as they operate in different organizational and cultural contexts. Therefore, it is essential for every country to have their own CG principles that will reflect their own

organizational, cultural, political and technological contexts. In Bangladesh, CG guidelines (2012) is the existing legal framework that is mandatory for firms to comply with. Consequently, it is really important to explore the executions and practices of CG by the listed firms in Bangladesh and its influence on different challenging fields like firm performance and capital structure.

The impact of CG on capital structure is assessed in not only developed but also developing countries. The results show mixed evidence due to the application of different theories and methodologies, different measurement of variables and explanations from contextual nature of individual firms. CG, the most globally discussed issue, is so far less investigated in Bangladesh as there are a few studies have already been done on this concern. Most of the existing papers (Amin & Jamil 2015; Rouf 2015; Hasan et al. 2014; Chowdhury & Chowdhury 2010) have discussed the relationship between firm performance and capital structure. The relationship between capital structure and CG is only examined in the study of Haque and Kirkpatrick (2011) where they used a CG index rather than individual CG factors like board size, female directors, audit committee size, independence of audit committee and so on. Therefore, the impact of individual CG factors on capital structure is still inconclusive in Bangladesh context. As a result of that, the present study is the first initiative to explore the impact of CG through individual CG factors on capital structure in Bangladesh. A sample of 197 firm-year observations is used in this study as the sample during the period of 2013-2017. In this study, CG is classified as board size, proportion of female directors on board, percentage of shares held by the directors, foreign ownership, audit

committee size and independence of audit committee where capital structure is measured by short-term debt to total assets and total debt to total assets.

The study finds that larger board size, higher foreign ownership and larger audit committee size help a firm to be less levered thus lead to be less risky while higher director ownership and independence of audit committee make a firm more levered thus lead to be riskier. This study also finds that there is no significant relationship between female directors and capital structure which implies that female directors don't have any monitoring role on capital structure in Bangladesh setting.

This study has some contributions. First, this investigation will extend the literature by assessing the impact of single CG factors on capital structure that will motivate the future researchers to work on this issue in Bangladesh. Second, this examination will help to find out whether the mechanisms of CG are effective enough or not. Third, it will help the regulators and policy makers to enhance the CG instruments particularly female directors and audit committee independence that can directly influence the capital structure. Finally, it suggests limiting the percentage of shares held by the directors to a certain level.

The remainder of the manuscript is structured as follows. Section 2 outlines the background of CG in Bangladesh. Section 3 reviews the literature on capital structure, the Bangladesh context and capital structure and CG, leading to the hypothesis development for this study. Section 4 describes the methodology used in this investigation, including sampling and data collection, data analysis methods and model specification. Section 5 documents the empirical results including descriptive statistics, correlation matrix, VIF test, multicollinearity test and Pooled OLS regression results and associated discussions along with empirical model to test the hypothesis, followed by a section 6 represents the additional analysis considering year dummy and lag model. Finally, the paper is concluded at the denouement of the study along with its contributions and limitations.

#### BACKGROUND OF CORPORATE GOVERNANCE IN BANGLADESH

Poor corporate governance and various firm's failures nowadays make the corporate governance related issues a burning topic of discussion in Bangladesh. Bangladesh Securities and Exchange Commission (BSEC) is the legal authority to issue corporate governance (CG) guidelines in Bangladesh. BSEC introduced CG on 20<sup>th</sup> February, 2006 for the first time in Bangladesh on "comply or explain" basis which means that there should be an explanation for any non-compliance. The main objective of the first introduced CG was to protect the minority shareholder interests and to enhance capital market improvement. BSEC revised the CG 2006 on 7<sup>th</sup> August, 2012 and issued new guidelines 2012 which is the current CG in Bangladesh. There are a lot of changes have been made on board composition and

activities, audit committee formulation and diligence, reporting to the shareholder and compliance with corporate governance.

Board of directors consists of executive and non-executive directors right now in the firms of Bangladesh except banks. A corporate board must range from a minimum 5 to a maximum 20 directors and the number of independent directors must be one fifth but not more than two third of the total directors on board according to CG 2012. The position of chairman and CEO has been separated in Bangladesh and it is mandatory for every firm to have different entities as chairman and CEO. The position of female director is clearly mentioned in CG 2012 that a corporate board must have at least one female director who must possess the quality of being a shareholder or an executive or an independent director. A corporate board must have at least an audit committee to ensure good governance as per CG 2012. The audit committee will work as a sub-committee of the board and must have at least three members. There must have at least an independent or a non-executive director on an audit committee. In Bangladesh, ownership of shares is highly concentrated and dominated by sponsor directors.

#### LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

##### CAPITAL STRUCTURE

The capital structure of a firm consists of debt and equity that is used by the firm to finance its operations (Azhagaiah & Gavoury 2011; Gill et al. 2009). There are several ratios of capital structure. The debt ratio is one of them measured by total debt to total assets (Abor 2005). The literature finds other proxies of capital structure like total liabilities to total assets (Gill & Mathur 2011), long-term debt to total assets (Anderson & Reeb 2004). Shubita and Alsawalhah (2012) stated that it is not wise to use only one proxy of capital structure to draw a general conclusion on capital structure as it can lead the result to be biased and incorrect. So, multiple proxies of capital structure like combination of short-term debt to total assets, long-term debt to total assets and total debt to total assets are used in the study of Hamid et al. (2015); and Hasan et al. (2014). Therefore, two proxies of capital structure namely short-term debt to total assets and total debt to total assets are used in this paper to explore the impact of corporate governance on capital structure. Long-term debt to total assets is excluded as the capital structure proxy due to be less relevant with corporate governance in the context of Bangladesh as total debt includes long-term debt and it is fixed in nature.

##### THE BANGLADESH CONTEXT

The most important and challenging financial decision making of a company is to form its capital structure through a perfect combination of two portions of capital structure which are debt and equity. This is because the

chances of contingent risk of default or bankruptcy may be increased when the capital structure includes a high proportion of debt. A perfect combination of debt and equity on firm's capital is highly required in Bangladesh to enhance the wealth of shareholders but cost of capital a negative factor on this decision has to be minimized (Chowdhury & Chowdhury 2010). It is also found that firm can enhance its market value by changing its capital structure.

An empirical study by Amin and Jamil (2015) found that short-term debt to total assets ratio is significantly and positively associated with firm performance. It implies that a firm earns more profit when it is highly levered with short-term debt. But a negative significant relationship between long-term debt to total assets ratio and firm performance was documented in that study on 7 listed cement companies in Bangladesh. The authors concluded on the results that long-term debt financing is relatively a costly source of financing for the firms and related to impose rigid covenants. The same result was also documented in the study of Hasan et al. (2014).

The negative association between leverage and firm performance proxies ROA and ROS was found in the study of Rouf (2015). The study was done on DSE listed 106 non-financial firms for the period of 2008-2011. The results from multiple regressions analyses found that debt ratio, debt-equity ratio and proprietary of equity ratio are negatively correlated with firm performance in Bangladesh.

Haque and Kirkpatrick (2011) analyzed the influence of corporate governance on firm's capital structure by covering a sample of 98 non-financial listed firms in Bangladesh. A corporate governance index was developed from a questionnaire to test the impact of corporate governance on capital structure through long-term debt ratio and total debt ratio. The empirical results found that firms with weak corporate governance have higher level of debt finance. It is suggested that the negative association between corporate governance and debt ratio is the likely result of the role of controlling shareholders' reluctance to give up absolute control rights. The authors said that when corporate governance is weak in a firm, the controlling shareholders are inclined to preserve their authority and informational benefits by selecting available bank debts at the same time holding their control on the firm.

## CAPITAL STRUCTURE AND CORPORATE GOVERNANCE

### BOARD SIZE

The board of directors is appointed by the shareholders. They are responsible for managing firm's activities, making strategic decisions and being an effective mechanism to monitor the internal corporate governance of a firm. However, the empirical evidence on the relationship between board size and capital structure is mixed in direction. There are several studies (Abobakr & Elgiziry 2016; Hasan & Butt 2009; Berger et al. 1997) which found

a significant negative relationship between board size and capital structure. The reason of being less levered by larger board is that managers' decisional power are reduced when the board is larger and prefers to include more equity than debt in firm's capital. Lower debt ratio helps a firm to be more profitable and reduces the risks of being default in future. On the other hand, studies have also found that larger board prefers higher level of leverage (Gill et al. 2012; Saad 2010). In the Bangladeshi context, several studies (Rahman & Saima 2018; Muttakin et al. 2012) found the effective monitoring role of larger board size to enhance the firm performance and firm performance is negatively associated with leverage (Hamid et al. 2015; Gill et al. 2009). So, following hypothesis is proposed:

H<sub>1</sub>: There is an impact of board size on firm's leverage in Bangladesh.

### FEMALE DIRECTORS

The participation of women in every sector of the economy around the world has conspicuously been increased due to women empowerment. Women are playing a significant role in the form of entrepreneurs or board of directors in the firms of Bangladesh. It is perceived that they have greater managing and decision making competence as they have more sincerity and patience than their male counterparts. The mixed evidence on the monitoring role of female directors to ensure better corporate governance is available. Abobakr and Elgiziry (2016) found that female directors on board help to reduce firm's leverage leading a firm to depend on more equity. In Bangladesh, the active monitoring role of gender diversification on board is found in the study of Muttakin et al. (2012). The negative role of female directors is also documented in the works of Bohren and Strom (2010); Adams and Ferreira (2009). However, Rahman and Saima (2018) documented the non-monitoring role of female directors as female directors in the firms of Bangladesh are basically wives, daughters and relatives of the directors. So, they don't have any active role to ensure corporate governance as they are appointed based on their family identity rather than skills and proper educational background, thus leading to the following hypothesis development:

H<sub>2</sub>: There is no impact of female directors on firm's leverage in Bangladesh.

### DIRECTOR OWNERSHIP

The percentage of shares held by the directors can play an important role to ensure better corporate governance in a firm. In Bangladesh, it is mentioned in corporate governance (CG) guidelines (2012) that each director other than independent director to be nominated in the board shall contain at least 5% shares of the paid up capital of the firm. But higher shares held by the directors make a firm more concentrated and lead the firm to be less effective to comply with CG because of the dominance on

the management. Therefore, firms tend to be less profitable as management can't play their significant role as agents of the shareholders. Abbas et al. (2013) found that director ownership is positively associated with firm performance at a certain percentage while it is also found in that study that the relationship becomes negative when the percentage of shares held by the directors goes beyond 50%. So, higher percentage of shares held by the directors makes a firm less profitable and thus makes risky of being default in loan payments due to be more levered. However, Kumar (2015) documented that there is no significant relationship between ownership of directors and capital structure of a firm. So, the following hypothesis is formulated:

H<sub>3</sub>: There is an impact of director ownership on firm's leverage in Bangladesh.

#### FOREIGN OWNERSHIP

Investors outside Bangladesh have an external monitoring role to establish corporate governance in a firm. Foreign investors usually invest in a firm having positive and sustainable firm performance and more levered firm is opposite to firm performance (Hamid et al. 2015). Therefore, foreign investors are not likely to invest in more levered firms. Kumar (2015) found that there is a negative affiliation of foreign ownership with leverage of a firm. It is concluded that firms with higher level of foreign ownership tend to be less levered, thus leading to propose the following hypothesis:

H<sub>4</sub>: There is an impact of foreign ownership on firm's leverage in Bangladesh.

#### AUDIT COMMITTEE SIZE

Audit committee is the most significant tool of corporate governance (CG) and it helps to enshrine better internal control of CG in a firm. It is mentioned in the CG guidelines (2012) in Bangladesh that an audit committee must be formed with at least 3 members and all members of the committee should have financial skills and literacy. It means that audit committee members are able to better understand the financial issues including internal control risk management process. Negative association between financial leverage and audit committee size is found in the study of Detthamrong et al. (2017). It is said by the authors that the effect of audit committee size on firm performance decreases when the firm is more levered. The effective monitoring role of audit committee to ensure better internal control and thus to increase firm performance is also documented in the study of Swamy (2011). But Al-Matari et al. (2012); Hsu and Petchsakulwong (2010) found the negative role of audit committee size on firm's value. So, from the discussions above following hypothesis is placed:

H<sub>5</sub>: There is an impact of audit committee size on firm's leverage in Bangladesh

#### AUDIT COMMITTEE INDEPENDENCE

The independence of the audit committee is the second most important quality of the audit committee that helps the committee to be effective to guarantee corporate governance (CG). CG guidelines (2012) recommend an audit committee to include at least one non-executive director who will maintain the audit committee independence. The non-executive members in the audit committee have a significant role in ensuring that CG practices are good to affect financial report (Swamy 2011). Firms lacking independence of audit committee and with majority of inside directors are more tend to involve in financial fraud (Abdullah et al. 2008). But the quality of the non-executive members on audit committee is also significant as unqualified members fail to assess the contingent risks associated with the debts. It is found in the study of Dar et al. (2011) that non-executive members on audit committee are ineffective to enhance the firm's value, thus leading to the following hypothesis development:

H<sub>6</sub>: There is an impact of audit committee independence on firm's leverage in Bangladesh.

#### METHODOLOGY

##### SAMPLING AND DATA COLLECTION

Secondary data from the annual reports of DSE listed manufacturing firms is used in this study. Total sample is 197 firm-year observations covering the year from 2013 to 2017. Initially this study started with more than 100 firms. Some of the firms were excluded due to the change of financial year. Some firms had different accounting year. Therefore, those firms were also kept out of the final sample. Some of the firms are newly incorporated in DSE leading not to have prior year annual reports. Finally, this paper limits its sample to 197 firm-year observations of 40 firms. The sample has been extracted from ceramics industry, food and allied industry, fuel and power industry, pharmaceuticals industry, textiles, and engineering industry.

##### DATA ANALYSIS METHODS

This study employs Pooled OLS regression model to fulfil the research objectives. The descriptive statistics of mean, minimum, maximum, and standard deviation are calculated to describe the corporate governance factors in details. Partial correlation matrix is also included to find out the individual relationship between the variables. To check the problem of multicollinearity, Variance Inflation Factor (VIF) is also estimated in this study. Breusch-Pagan test is also applied to this paper to address the problem of heteroskedasticity. Three types of Pooled OLS regressions are employed to test the hypotheses: Pooled OLS regression considering the robust standard-error adjustment to mitigate the heteroskedasticity problem, Pooled OLS regression considering the year dummy to check the impact

of previous year and Pooled OLS regression considering the lag model to address the endogeneity problem in the research model

#### MODEL SPECIFICATION

The paper uses the research model used in the studies of Siromi and Chandrapala (2017); Tarus and Ayabei (2016); and Abobakr and Elgiziry (2016) with some modifications to find out the impact of corporate governance factors on capital structure in Bangladesh. The linear multivariate model for this study is:

$$\text{Capital Structure} = \beta_0 + \beta_1 \text{BDSIZE} + \beta_2 \text{BDGEN} + \beta_3 \text{DOWN} + \beta_4 \text{FOWN} + \beta_5 \text{AUDSIZE} + \beta_6 \text{AUDIND} + \beta_7 \text{AGE} + \beta_8 \text{SIZE} + \beta_9 \text{GROWTH} + \varepsilon$$

Following Table 1 represents the definition and measurement of the variables of the study

#### DATA ANALYSIS AND RESULTS

##### DESCRIPTIVE ANALYSIS

Table 2 illustrates the descriptive statistics of the corporate governance factors providing the evidence of the extent

of compliance by the Bangladeshi manufacturing firms with the rules and regulations of best practice on corporate governance (CG). Short-term debt ratio, total debt ratio, number of female directors, director ownership, foreign ownership, number of independent directors and firm growth are expressed in percentage form. Board size, audit committee size and firm age are expressed in actual value while firm size is expressed in natural logarithm form.

Table 2 documents that an average number of directors on board is approximately 7 persons ranging from a minimum 5 members to a maximum 13 members. The finding is in line with the finding of Muttakin et al. (2012). This is the evidence of the compliance with the CG guidelines (2012) to have a board of at least 5 members. Average percentage of female directors on board is approximately 17% ranging from 0% to 50% with a standard deviation of 15.07%. This finding intimates that the female participation on board activities in Bangladesh has increased by 17% and the finding is similar to Rahman and Saima (2018); and Muttakin et al. (2012). But minimum 0% indicates the blatant violation of the CG guidelines (2012) to have at least one female director on board. The mean value of the audit committee size is roughly 3 ranging from a minimum 3 members to a maximum 6 members. CG guidelines (2012) in Bangladesh suggest that an audit committee must hold at least 3

TABLE 1. Definition and measurement of the variables

	Variables	Full name	Measurement	Reference
Dependent Variables- Capital Structure	STDTA	Short-term debt ratio	Short-term debt/Total assets	Kyriazopoulos (2017); Amin & Jamil (2015)
	TDTA	Total debt ratio	Total debt/Total assets	Kyriazopoulos (2017); Siromi & Chandrapala (2017); Haque & Kirkpatrick (2011)
Independent Variables- Corporate Governance Factors	BDSIZE	Number of directors on board	Natural logarithm form of total directors on board	Siromi & Chandrapala (2017); Tarus & Ayabei (2016); Muttakin et al. (2012)
	BDGEN	Female directors on board	Total female directors on board/ Total directors on board	Abobakr & Elgiziry (2016)
	DOWN	Director ownership	Percentage of shares held by the directors	Muttakin et al. (2012)
	FOWN	Foreign ownership	Percentage of shares held by the entities outside Bangladesh	Rana et al. (2017)
	AUDSIZE	Audit committee member	Natural logarithm form of total members on audit committee	Alam & Akhter (2017)
	AUDIND	Independent members on audit committee	Total independent members on audit committee/ Total members on audit committee	Afza & Nazir (2014)
Control Variables- Firm Characteristics	AGE	Firm age	Present year-Incorporation year	Kyriazopoulos (2017); Tarus & Ayabei (2016)
	SIZE	Firm size	Natural logarithm form of total assets	Tarus & Ayabei (2016); Amin & Jamil (2015)
	GROWTH	Sales growth	Current year sales minus previous year sales and divided by previous year sales.	Amin & Jamil (2015); Muttakin et al. (2012)

TABLE 2. Descriptive statistics

Variable	N	Mean	Std. Dev.	Min	Max
STDTA (%)	197	15.22	16.91	0	91.52
TDTA (%)	197	23.69	19.15	0	91.52
BDSIZE	197	6.9746	1.7912	5	13
BDGEN (%)	197	16.54	15.07	0	50
DOWN (%)	197	39.39	20.40	0	95
FOWN (%)	197	1.18	5.22	0	42.49
AUDSIZE	197	3.3096	0.5538	3	6
AUDIND (%)	197	35.31	12.32	20	100
AGE	197	17.84	11.0375	1	38
SIZE	197	7.5237	1.3658	4.2767	11.2709
GROWTH (%)	197	7.49	42.82	-100	414.55

members and the result insinuates that the minimum requirement is satisfied. Audit committee consists of an average 35% of independent members representing that a significant number of audit committee members are independent. Directors on board hold an average 39% of shares and roughly 1.18% shares of the company are held by foreign investors. It means that foreign participation is very low in Bangladeshi manufacturing firms. Mean short-term debt ratio is 15.22% and mean total debt ratio is 23.69%. Average firm age is roughly 18 years ranging from 1 year to 38 years. Average firm size 7.5237 is worth of BDT 5140 million and average firm's growth is 7.49%.

#### CORRELATION MATRIX

Table 3 represents a simple correlation matrix for the main variables used in this study. The table shows that board size and audit committee size are negatively and significantly correlated with short-term debt ratio while

director ownership and independent members on audit committee are positively and significantly associated with short-term debt ratio. There is a negative relationship between short-term debt ratio and female directors and foreign ownership but insignificant.

It is also found that director ownership and independent audit committee members are positively and significantly correlated with total debt ratio while audit committee size is negatively and significantly associated with total debt ratio.

Table 4 reveals the result of multicollinearity test using Variance Inflation Factors (VIF). According to Field (2005), multicollinearity exists when there is a strong correlation between or among two or more explanatory variables. The result shows that there is no multicollinearity problem among the independent variables, including moderating variables, as mean VIF and individual VIF don't exceed the threshold of VIF values of 10 (Gujrati 2003; Hair et al. 2006).

TABLE 3. Spearman correlation matrix

	STDTA	TDTA	BDSIZE	BDGEN	DOWN	FOWN	AUDSIZE	AUDIND
STDTA	1							
TDTA	0.8293 (0.0000)	1						
BDSIZE	-0.2550 (0.0003)	-0.0579 (0.4193)	1					
BDGEN	-0.0449 (0.5311)	-0.0679 (0.3429)	-0.0255 (0.7220)	1				
DOWN	0.1320 (0.0645)	0.1191 (0.0955)	0.1480 (0.0379)	0.2763 (0.0001)	1			
FOWN	-0.0244 (0.7340)	-0.0841 (0.2402)	0.0291 (0.6846)	0.1598 (0.0249)	-0.0819 (0.2525)	1		
AUDSIZE	-0.2071 (0.0035)	-0.1338 (0.0609)	0.2626 (0.0002)	-0.0202 (0.7778)	0.0560 (0.4341)	-0.1078 (0.1317)	1	
AUDIND	0.4157 (0.0000)	0.2350 (0.0009)	0.0106 (0.8825)	-0.1570 (0.0275)	-0.0318 (0.6569)	0.0881 (0.2184)	-0.0850 (0.2347)	1

(The numbers in brackets represent the *p* value of the coefficients)

TABLE 4. Checking of multicollinearity

Variable	VIF	1/VIF
SIZE	1.70	0.588497
AGE	1.41	0.710165
BDGEN	1.25	0.801638
AUDIND	1.23	0.811234
BDSIZE	1.22	0.820440
FOWN	1.16	0.859129
DOWN	1.16	0.861752
AUDSIZE	1.11	0.899979
GROWTH	1.08	0.930156
Mean VIF	1.26	

Table 5 represents the result of Breusch-Pagan test to find out whether there is any heteroskedasticity problem exists in the research model. Lower P value at 0% level suggests the existence of heteroskedasticity problem. White's (1980) consistent-error adjustment is applied to the regression model to resolve this problem.

TABLE 5. Heteroskedasticity test

	STDTA	TDTA
Chi2 (1)	56.06	15.60
Prob > chi2	0.0000	0.0001

#### REGRESSION RESULTS

Table 6 documents the results of Pooled OLS regressions model to investigate the impact of corporate governance (CG) factors on capital structure in Bangladesh. The first column of Table 6 represents the relevant variables name, the second column illustrates the coefficients,

standard error, t-statistics and significance level of CG factors on short-term debt ratio, and the third column shows the coefficients, standard error, t-statistics and significance level of CG mechanisms on total debt ratio. The regressions are run with robust standard-error adjustment to resolve the heteroskedasticity problem.

It is found from the following Table 6 that there is a significant negative relationship between board size, foreign ownership and audit committee size and short-term debt ratio (STDTA) and total debt ratio (TDTA) respectively. But a significant positive relationship between director ownership and independent auditor and short-term debt ratio (STDTA) and total debt ratio (TDTA) respectively is also found in the results. The negative significant association of board size and audit committee size with STDTA and TDTA indicates that an increase in the number of directors causes a decrease in the leverage of firms. This result is consistent with the result of Abobakr and Elgiziry (2016); and Hasan and Butt (2009) and supports the Resource Dependency Theory that larger board size and audit committee size consist of human resources with different backgrounds and skills play a vital role to restrict the extent of leverage in a firm. Several studies (Hamid et al. 2015; Gill et al. 2009) found the negative association between leverage and firm performance and they construed that higher debt in capital makes a firm riskier of being bankrupt. Therefore, larger board size and audit committee size play their monitoring role on firms to limit the level of leverage and thus to help to make a firm more profitable and less risky. It is also documented in the result that when the shares held by the entities outside Bangladesh increase, the flow of leverage in a firm decrease. So it can be said that foreign ownership has a role on firms to shrink the degree of leverage and thus to support a firm to be more profitable and less risky of being default. The same profit

TABLE 6. Regressions results

Variable	Dependent Variable - STDTA				Dependent Variable - TDTA			
	Coefficient	Std. error	t-stat	Sig.	Coefficient	Std. error	t-stat	Sig.
BDSIZE	-0.2129	0.0419	-5.09	0.000	-0.1067	0.0594	-1.80	0.074
BDGEN	-0.0223	0.0733	-0.30	0.761	-0.0427	0.0915	-0.47	0.641
DOWN	0.1848	0.0495	3.73	0.000	0.1800	0.0631	2.85	0.005
FOWN	-0.2860	0.0933	-3.06	0.002	-0.6022	0.1282	-4.70	0.000
AUDSIZE	-0.1479	0.0637	-2.32	0.021	-0.1792	0.0913	-1.96	0.051
AUDIND	0.6927	0.1868	3.71	0.000	0.5524	0.1978	2.79	0.006
AGE	0.0029	0.0011	2.62	0.010	0.0050	0.0014	3.61	0.000
SIZE	0.0210	0.0083	2.53	0.012	0.0392	0.0125	3.15	0.002
GROWTH	0.0683	0.0245	2.79	0.006	0.0843	0.0268	3.15	0.002
Constant	0.2090	0.1318	1.59	0.114	0.0115	0.1543	0.07	0.941
R <sup>2</sup>	0.3432				0.1991			
F	6.67			0.000	7.32			0.000
N	197				197			

increasing monitoring role of foreign ownership is found in the study of Muttakin et al. (2012) and Kumar (2015) also found the negative relationship between foreign ownership and leverage. So, our expectations expressed in Hypothesis H1, H4 and H5 are accepted.

On the other hand, positive association between director ownership and independent audit committee members with leverage ratios insinuates that the flow of leverage in a firm increase when the percentage of shares held by the directors on board and the proportion of independent members on audit committee increase. This implies the negative role of this two variables on firm's values. Higher percentage of shares held by the directors shrinks the participation of the common people as they are demotivated to invest in those firms having higher level of director ownership. The finding is in line with Abbas et al. (2013) that higher director ownership makes a firm less profitable and leverage is negatively linked to profitability. So, higher director ownership makes a firm more levered and less profitable and thus our hypothesis H3 is accepted. Higher percentage of independent members on audit committee motivates firms to be more levered and puts the firms towards to be riskier. This is because the independent directors may be large in numbers but they are not effective and efficient to assess the contingent risks associated with the leverage. The ineffectiveness of the audit committee independence is also found in the study of Dar et al. (2011) and thus leading our hypothesis H6 to be accepted.

The proportion of female directors on board is negatively associated with leverage ratios but insignificant. This finding discloses that female directors on board are not playing their significant role to restrict the inflow of leverage to a firm. This is because most of the female directors in Bangladeshi firms are the spouse, daughters, and relatives of the sponsors and managing directors. Therefore, female directors can't play their significant controlling role to enhance the firm value by limiting the leverage in Bangladeshi manufacturing firms. The same non-monitoring role of female directors

in Bangladesh is also found in the study of Rahman and Saima (2018). Therefore, our expectation expressed in H2 is also taken. Moderating variables are also significantly related to capital structure. Firm age, firm size, and firm growth are positively and significantly correlated with STDTA and TDTA at 1% level. The summary of the above regressions results is given in the following Table 7.

#### ROBUSTNESS CHECK

Table 8 presents the results of Pooled OLS regressions considering year dummy. The results show that previous year impact doesn't exist on the results as the results are as same as the results documented in Table 6 which is the negative association of board size, audit committee size, foreign ownership and positive association of director ownership and independent members on audit committee with STDTA and TDTA respectively.

Table 9 delineates the lag model regressions to examine the impact of corporate governance on capital structure. The results show that there is no endogeneity problem between the independent variables and dependent variable STDTA as the result is similar to the result of Table 6. The following Table 9 also suggests that there may be the presence of endogeneity problem when the dependent variable is TDTA.

#### CONCLUSION

In this study, we have investigated the impact of corporate governance (CG) factors on capital structure using data from manufacturing firms listed on the DSE. To be more exact, we have examined the efficiency of CG factors; board size, proportion of female directors on board, director ownership, foreign ownership, audit committee size and percentage of independent members on audit committee on capital structure namely short-term debt to total assets and total debt to total assets. We have inspired to take this initiative due to several reasons. First, the relationship between CG factors and capital structure in

TABLE 7. Hypothesis testing based on significant level

Hypothesis		Results	Ratio
There is an impact of board size on firm's leverage in Bangladesh	H1	Accepted P= 0.000 < 0.01 P= 0.074 < 0.1	STDTA TDTA
There is no impact of female directors on firm's leverage in Bangladesh	H2	Accepted P= 0.761 > 0.1 P= 0.641 > 0.1	STDTA TDTA
There is an impact of director ownership on firm's leverage in Bangladesh	H3	Accepted P= 0.000 < 0.01 P= 0.005 < 0.01	STDTA TDTA
There is an impact of foreign ownership on firm's leverage in Bangladesh	H4	Accepted P= 0.002 < 0.01 P= 0.000 < 0.01	STDTA TDTA
There is an impact of audit committee size on firm's leverage in Bangladesh	H5	Accepted P= 0.021 < 0.05 P= 0.051 < 0.1	STDTA TDTA
There is an impact of audit committee independence on firm's leverage in Bangladesh	H6	Accepted P= 0.000 < 0.01 P= 0.006 < 0.01	STDTA TDTA



TABLE 8. Regressions results (Year dummy)

Variable	Dependent Variable - STDTA				Dependent Variable - TDTA			
	Coefficient	Std. error	t-stat	Sig.	Coefficient	Std. error	t-stat	Sig.
BDSIZE	-0.2196	0.0417	-5.27	0.000	-0.1133	0.0594	-1.87	0.063
BDGEN	-0.0186	0.0737	-0.25	0.801	-0.0383	0.0918	-0.42	0.678
DOWN	0.1840	0.0494)	3.72	0.000	0.1793	0.0633	2.83	0.005
FOWN	-0.2870	0.0971	-2.95	0.004	-0.6028	0.1343	-4.49	0.000
AUDSIZE	-0.1414	0.0643	-2.20	0.029	-0.1712	0.0934	-1.83	0.068
AUDIND	0.7059	0.1829	3.86	0.000	0.5643	0.1935	2.92	0.004
AGE	0.0032	0.0011	2.85	0.005	0.0053	0.0014	3.72	0.000
SIZE	0.0242	0.0085	2.84	0.005	0.0424	0.0128	3.32	0.001
GROWTH	0.0683	0.0256	2.67	0.008	0.0836	0.0261	3.20	0.002
Constant	0.2071	0.1313	1.58	0.116	0.0083	0.1548	0.05	0.957
R <sup>2</sup>	0.3594				0.2108			
F	4.78				4.81			
N	197				197			
Year Dummy	Yes				Yes			

TABLE 9. Regressions results (Lag model)

Variable	Dependent Variable - STDTA				Dependent Variable - TDTA			
	Coefficient	Std. error	T-stat	Sig.	Coefficient	Std. error	T-stat	Sig.
BDSIZE	-0.1695	0.0537	-3.16	0.002	-0.0733	0.0747	-0.98	0.328
BDGEN	-0.0272	0.0950	-0.29	0.775	-0.0258	0.1154	-0.22	0.823
DOWN	0.1267	0.0543	2.33	0.021	0.1054	0.0739	1.43	0.156
FOWN	-0.2719	0.1056	-2.58	0.011	-0.6586	0.1624	-4.06	0.000
AUDSIZE	-0.1654	0.0706	-2.34	0.020	-0.1531	0.1244	-1.23	0.220
AUDIND	0.5675	0.2564	2.21	0.028	0.4171	0.2689	1.55	0.123
AGE	0.0020	0.0013	1.62	0.107	0.0036	0.0016	2.24	0.026
SIZE	0.0127	0.0112	1.13	0.260	0.0335	0.0153	2.19	0.030
GROWTH	0.0078	0.0300	0.26	0.795	0.0201	0.0383	0.53	0.600
Constant	0.2938*	0.1652	1.78	0.077	0.0642	0.1916	0.34	0.738
R <sup>2</sup>	0.2565				0.1130			
F	3.94				3.65			
N	157				157			

Bangladesh is less explored. Second, most of the existing literatures are focused on financial sector. Third, most of the existing studies are done on primary data collected through questionnaire survey (Haque & Kirkpatrick, 2011). Fourth, most of the studies used CG index rather than individual CG factors as independent variables. Therefore, this study is a milestone to cover the above mentioned points to explore the impact of CG factors on capital structure in Bangladesh.

A number of findings from the analysis are:

1. Larger board size, larger audit committee size and higher foreign ownership are negatively associated with leverage ratios
2. Higher director ownership and higher representation of independent members on audit committee are positively associated with leverage ratios

3. Proportion of female directors on board is not related to leverage ratios.

Our first finding supports the concept of Resource Dependency Theory that larger board size consists of skilled and knowledge human resources lead a firm to include more equity in the capital structure and help to be more profitable as more equity based firms are positively associated with firm performance. Previous studies (Abobakr & Elgiziry 2016; Hasan & Butt 2009) also found the same result. Similarly, larger audit committee size also helps firm to be equity based firms. This study also finds that higher foreign ownership limits a firm to be more levered as levered firms tend to be riskier of being default and foreign investors are aware of this concern. The effective monitoring role of foreign ownership is also documented in the study of Muttakin et al. (2012).

The results also reveal that higher director ownership and independent audit committee members prefer a firm to be more levered. This is because independent audit committee members are less predictive of the contingent risks associated with debts. To keep the firms out of the contingent risks related to debts, director ownership must be limited to a certain level.

Contrary to the above findings, another important finding is that the representation of female directors on board plays no significant role on capital structure in Bangladesh. Many prior studies (Rahman & Saima 2018; Muttakin et al. 2012) recorded that most of the female directors on board in Bangladeshi firms are spouse, daughters, and relatives of the directors. Therefore, they can't exercise significant role to establish better CG.

Above all, it can be concluded that proper compliance with CG guidelines helps Bangladeshi manufacturing firms to include more equity than debt in their capital structure and thus helps to stay away of the contingent risks associated with the debts and makes more profitable.

The contributions of this study are: first, it extends the literature on capital structure and corporate governance with more insights and latest data; second, it suggests limiting the shares held by the directors to a certain level; third, it also recommends the policy makers to rethink about the role of female directors on board and independent audit committee members. This study has some limitations like others. Lower sample size weakens the generalization of the conclusion drawn from the results. There are some corporate governance factors like board independence, audit committee meetings, institutional ownership which are not included in our study. Prospective researchers are welcome to explore this issue with the consideration of these factors along with different methodology.

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Mohammad Rajon Meah\*  
 Postgraduate on Accounting and Information Systems  
 Faculty of Business Studies  
 University of Dhaka  
 BANGLADESH  
  
 Room No. 326  
 Kabi Jasimuddin Hall  
 University of Dhaka  
 BANGLADESH  
 E-mail: m.rajon.meah@gmail.com

\*Corresponding author