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Board influence on accruals management and the role of ownership structure: Evidence from Bangladesh

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ABSTRACT

The main purpose of this study is to explore the association between accruals management (AM) and board attributes. Additionally, the study investigates the moderating role of ownership structures. In order to perform the study, five years of data (2016–2020) for 159 firms listed on the Dhaka Stock Exchange (DSE) have been considered, consisting of 759 firm-year observations. Agency theory that governs the relationship between the principal and the agent has been applied here. We have used STATA software with the random effects GLS model to run the regression on the balanced panel data. The results of the analysis show that, while board size and board independence have significant positive relation with AM, gender diversity, institutional ownership and family ownership show a significant negative association with AM. The analysis of moderating variables shows that foreign ownership has a significant negative impact on the association between board expertise and AM, and family ownership has a significant negative impact on board independence and AM. These findings indicate that the type of ownership structure may be useful in attaining the objectives of the board in Bangladesh. The findings of the study will be relevant for the regulatory authorities in Bangladesh in controlling and implementing new guidelines related to corporate governance.

Contribution/Originality: This study examines the role of ownership structure on the relationship between board and earnings management, which is one of the very few studies in the context of an emerging economy. Moreover, the study applies the extended modified Jones model, which enhances the literature on accruals estimation.

1. INTRODUCTION

This paper aims to empirically examine how board variables and ownership structure variables are associated with the accruals management of a firm in an emerging economy. Board variables, such as size, expertise, independence, and female representation, and ownership variables, such as managerial, institutional, and foreign ownership, will be examined. Accounting scandals including the South Sea Bubble of 1720, the Enron Scandal in 2001, and the recent Satyam Scandal in 2009 raised great concern regarding the integrity of the accounting profession (Bhasin, 2013; Li, 2010). Financial reporting was opportunistically manipulated so that the consequences of the scandals remain unknown to financial markets. Accounting scandals in recent decades have highlighted the

importance of strengthening governance procedures in emerging economies where information asymmetry is very high. Healy and Wahlen (1999) stated that earnings management is a deliberate action of financial managers to manipulate financial reports in order to deceive stakeholders, or for private gain, which depends on the reported earnings. Discretion in choosing accounting techniques and estimates allows managers to manage reported earnings. Information asymmetry is one of the common barriers that investors and other stakeholders of emerging economies commonly face. Due to existence of the information asymmetry, managers can manipulate reported earnings to gain personal benefits, affecting the earning quality of the reported firms. A study based on 180 manufacturing firms in Malaysia provides evidence that earnings management is a dominant factor that misleads external investors who end up with an inefficient investment and that negative stock returns are associated with increased discretionary accruals (Chu & Song, 2010). Roychowdhury (2006) shows that real earnings management tools include temporary increases in sales, overproduction, reduction of discretionary accruals, and increases in inventory and receivables.

Previous studies have shown that board variables have associations with the earnings management practices of firms. Efficiency of the governance system determines to what extent management will exercise opportunistic behavior in terms of managing reported earnings. Saona, Muro, and Alvarado (2020) conducted research in Spain and found evidence that managers of listed firms opportunistically manage reported earnings and that the governance system determines the opportunistic behaviors of the managers. A study based on US firms with both high and low levels of discretionary accruals shows evidence that corporate governance variables, such as the audit committee and the board of directors, have significant associations with earnings management practices (Chtourou, Bedard, & Courteau, 2001). Similar findings have been reported in a Nigerian study which states that board variables have a significant relationship with earnings management (Obigbemi, Omolehinwa, Mukoro, Ben-Caleb, & Olusanmi, 2016). Ownership structures on the other hand are also relevant in influencing the earnings management practices of a firm. An analysis of South Korean firms shows that business group ownership has a significant association with higher earnings quality (Tessema, Kim, & Dandu, 2018). Research by Ali, Chen, and Radhakrishnan (2007) shows that although family firms are associated with fewer governance-related disclosures, they represent better earnings quality. By analyzing 1,200 firms across 24 emerging markets, Bao & Lewellyn (2017) conducted a comprehensive study which explains that ownership structures do not influence earnings in isolation but are influenced by the institutional governance environment, such as regulatory quality and minority shareholder protection (Bao & Lewellyn, 2017).

1.1. Research Significance

To the best of our knowledge, this study is the first to conduct such a comprehensive study on accruals management practices in listed Bangladeshi companies. The study seeks to answer the following questions:

a. How are board structure variables associated with accruals management in Bangladesh?
b. What is the association between ownership structure and accruals management of non-financial firms in Bangladesh?
c. How does ownership structure moderate the association between board attributes and accruals management practices in the context of Bangladeshi firms?

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Earnings management can be considered an indication of agency problems. The present study is grounded on agency theory, which states that a conflict of interest exist between the owners of a company (the shareholders) and the management team (Jensen & Meckling, 1976). Conflict emerges when an agent fails to act in the best interest of the principal. According to the theory, management is required to act in the best interests of the shareholders, but in reality, management prioritizes their own interests. In a corporate setting, an agency problem is created when managers generate financial reports to serve their own purpose. As a result, monitoring managers' actions has become

critical to shield the interests of the shareholders and protect the reliability of the financial reporting. Successful corporate governance systems impose restrictions on managerial actions to ensure that investors receive returns on their investment (Shleifer & Vishny, 1997). In the case of financial reporting, the responsibility of corporate governance is to ensure that accounting rules are applied to increase the consistency and dependability of the financial statements (Cohen, Krishnamoorthy, & Wright, 2004). On the other hand, the ownership structure of a firm serves as a powerful mechanism to reduce agency costs through controlling the actions of the managers.

2.1. Board Size

The association between board size and earnings quality remains uncertain. The study by Lai and Tam (2017) on Chinese listed firms did not find significant evidence to correlate board size and earnings management. Some research indicates that larger boards are more effective in reducing earnings management (Khalil & Ozkan, 2016; Xie, Davidson, & DaDalt, 2003). Other research advocates that smaller boards are more effective in controlling earnings management (Abdul Rahman, Haneem, & Fairuzana, 2006). Waweru and Prot (2018) conducted a study on Kenya and Tanzania and found that board size has no significant relation with the earnings management practices of firms. For our hypothesis, we have assumed that board size and accruals management are negatively associated.

H1: Board size is negatively associated with accruals management.

2.2. Board Independence

The aforementioned study on Chinese listed firms by Lai and Tam (2017) provides relevant and thought-provoking evidence which shows that although the existence of independent directors on the board are negatively associated with the earnings management of the firm, the marginal benefit of adding independent directors is insignificant and, in some cases, the effects could be negative. Numerous studies have found a negative correlation between board independence and earnings management in emerging economies where legal and technological frameworks are not strong enough to put efficient controls in place to prevent earnings management behavior. We are therefore assuming that independent directors are necessary to control earnings management practices and hence assuming a negative relationship.

H2: Board independence has a negative relationship with accruals management.

2.3. Gender Diversity

Many studies suggests that female board members are more socially responsible and, consequently, their representation on corporate boards is negatively associated with earnings management activities (Kyaw, Olugbode, & Petracci, 2015; Orazalin, 2019). Kyaw et al. (2015) also found that female representation on boards is more effective in reducing earnings management only in countries where gender equality is relatively high. Ye, Zhang, and Rezaee (2010) did not find evidence to support any association between female board members and earnings management. For this study, we are assuming that female members and accruals management activities are negatively associated.

H3: Gender diversity has a negative association with accruals management.

2.4. Board Expertise

The financial proficiency of board directors is crucial to effectively oversee the operations of financial executives. Xie et al. (2003) suggest that board members with a financial background, such as investment banking, are negatively associated with a firm's earnings management activities. A study based on Canadian firms presented similar findings, that directors with a financial intermediary background are negatively associated with abnormal accruals (Park & Shin, 2004). We are therefore assuming a negative relation between board expertise and accruals management activities.

H4: Board expertise has a negative relationship with accruals management.

2.5. Institutional Ownership

A study of firms listed on the CNX 500 index of the National Stock Exchange (NSE) of India shows that institutional investors restrict managers from using discretionary powers in managing earnings and that the presence of institutional investors is negatively associated with earnings management (Ajay & Madhumathi, 2015). Potharla, Bhattacharjee, and Iyer (2021) also suggest similar findings, that institutional ownership strengthens the effectiveness of monitoring and hence these investors have a negative impact on earnings management. The study by Ramalingegowda, Utke, and Yu (2021) on common institutional ownership also confirms that institutional investors are effective in reducing earnings management. In line with the above findings, Tessema et al. (2018) shows that in South Korea there is a significant correlation between companies that belong to any of the 30 biggest business groups and improved quality of earnings. Thus, this study hypothesizes that institutional investors are more effective in monitoring financial managers, hence assuming that a negative association exists between accruals management and institutional ownership.

H5: Institutional ownership has a negative relationship with accruals management.

2.6. Foreign Ownership

Research based on Korean firms shows that due to lack of their capacity to supervise firm activities, foreign equity investors prefer a stable income rather than a noisy one and, consequently, foreign ownership is positively associated higher income smoothing (Jung, Lee, Shin, & Yuen, 2020). However, research based on Japanese firms shows that foreign investors are associated with few business ties to local management and improves accounting oversights and is consequently negatively associated with earnings management (Guo, Huang, Zhang, & Zhou, 2015).

H6: Foreign ownership has a positive relationship with accruals management.

2.7. Family Ownership

Family ownership could be both positively and negatively related to the quality of the earnings contingent regarding the reputation and purpose of the family holdings. Even the impact of independent directors is weaker on the earnings management practices of a family-controlled firm (Prencipe & Bar-Yosef, 2011). For the purpose of our study, we are assuming a positive association between family control and earnings management. A study on companies in South Korea confirms a similar finding, that in order to gain an unfair advantage, family ownership may be involved with higher earnings management activities (Tessema et al., 2018).

H7: Family ownership has a positive relationship with accruals management.

2.8. Ownership Structure – the Moderating Variable

Shaker, Ezghayer, and Adam (2020) investigated whether ownership structure plays a significant role in shaping and practicing corporate governance (AL-Duais, Malek, & Hamid, 2019) and found that ownership structure has a moderating role in managing earnings. Some studies also show similar evidence, that in the presence of family ownership control, the impact of board independence on earnings management becomes weaker (Idris, Siam, & Nassar, 2018; Prencipe & Bar-Yosef, 2011). A Hong Kong-based analysis suggests that family control in the form of ownership or in the form of representation on the board moderates the effectiveness of the corporate board (Jaggi, Leung, & Gul, 2009). Similar findings have been observed under foreign ownership. The study by Ahmed and Iwasaki (2021) on Japanese firms shows that foreign investors are more likely to appoint independent directors to ensure effective monitoring of earnings management. Based on previous research, we have assumed the following hypotheses:

H8: Institutional ownership moderates the relationship between board characteristics and accruals management.

H9: Foreign ownership moderates the relationship between board characteristics and accruals management.

H10: Family ownership moderates the relationship between board characteristics and accruals management.

3. RESEARCH FRAMEWORK

The objective of this study is to determine the consequences of board characteristics on accruals management (AM) where discretionary accruals (DA) is projected by using the model proposed by Yoon, Miller, and Jiraporn (2006). This study also discovers the connotation between the ownership structure of a firm and accruals management. Moreover, the moderating role of ownership structure on the association between board characteristics and accruals management is explored. Figure 1 shows the theoretical framework of the study.

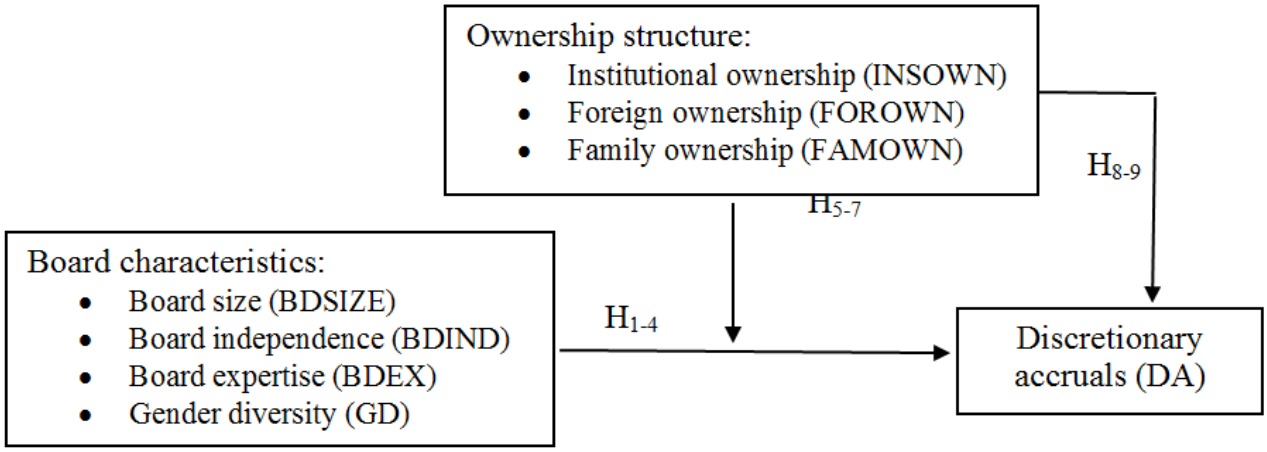

Figure 1. Study framework.

4. RESEARCH METHODOLOGY

4.1. Data Collection

Data from all companies listed on the Dhaka stock Exchange (DSE), excluding financial industries, has been considered for a period of five years, from 2016 to 2020, with a total of 795 firm-year observations. Financial and government companies have been excluded because previous studies have shown their diverse capital structures and management (Hasan & Rahman, 2020; Ismail, Kamarudin, van Zijl, & Dunstan, 2013; Molla, Hasan, Miraz, Azim, & Hossain, 2021). Also, selected companies have not been considered for the study due to the non-availability of financial reports for the study period. Accruals management proxies (discretionary accruals) are regressed on board structure and ownership variables along with a number of indicators and control variables to answer the research questions (Skrivanek, 2009).

4.2. Regression Model for the Hypotheses

A multivariate regression model is applied to derive the associations among the variables; Equations 1–4 are used for the regression model.

Model 1: Board characteristics and accruals management.

$$DA_{it} = \beta_0 + \beta_1 BDSIZE_{it} + \beta_2 BDIND_{it} + \beta_3 BDEXP_{it} + \beta_4 GD_{it} + \beta_5 SIZE_{it} + \beta_6 GRT_{it} + \beta_7 ROA_{it} + \beta_8 LEV_{it} + \beta_9 AQ_{it} + \varepsilon_{it} \quad (1)$$

Model 2: Moderating variables on accruals management.

$$DA_{it} = \beta_0 + \beta_1 INSOWN_{it} + \beta_2 FAMOWN_{it} + \beta_3 FOROWN_{it} + \beta_4 SIZE_{it} + \beta_5 GRT_{it} + \beta_6 ROA_{it} + \beta_7 LEV_{it} + \beta_8 AQ_{it} + \varepsilon_{it} \quad (2)$$

Model 3: Independent, moderating and dependent variables.

$$DA_{it} = \beta_0 + \beta_1 BDSIZE_{it} + \beta_2 BDIND_{it} + \beta_3 BDEXP_{it} + \beta_4 GD_{it} + \beta_5 INSOWN_{it} + \beta_6 FAMOWN_{it} + \beta_7 FOROWN_{it} + \beta_8 SIZE_{it} + \beta_9 GRT_{it} + \beta_{10} ROA_{it} + \beta_{11} LEV_{it} + \beta_{12} AQ_{it} + \varepsilon_{it} \quad (3)$$

Model 4: The moderating role of family ownership on board characteristics and accruals management (AM).

$$DA_{it} = \beta_0 + \beta_1 BDSIZE_{it} + \beta_2 BDIND_{it} + \beta_3 BDEXP_{it} + \beta_4 GD_{it} + \beta_5 INSOWN_{it} + \beta_6 FAMOWN_{it} + \beta_7 FOROWN_{it} + \beta_8 BDSIZE * FAMOWN_{it} + \beta_9 BDIND * FAMOWN_{it} + \beta_{10} BDEXP * FAMOWN_{it} + \beta_{11} GD *$$

$$FAMOWN_{it} + \beta_{12}BDSIZE * FOROWN_{it} + \beta_{13}BDIND * FOROWN_{it} + \beta_{14}BDEXP * FOROWN_{it} + \beta_{15}GD * FOROWN_{it} + \beta_{16}BDSIZE * INSOWN_{it} + \beta_{17}BDIND * INSOWN_{it} + \beta_{18}BDEXP * INSOWN_{it} + \beta_{19}GD * INSOWN_{it} + \beta_{20}SIZE_{it} + \beta_{21}GRT_{it} + \beta_{22}ROA_{it} + \beta_{23}LEV_{it} + \beta_{24}AQ_{it} + \varepsilon_{it} \quad (4)$$

Table 1 presents the definitions of the different variables used in the study.

Table 1. Variable measurements.

Variable	Acronym	Definition
Discretionary accruals	DA	Absolute value of discretionary accruals
Board size	BDSIZE	Total number of board members
Board independence	BDIND	Proportion of independent non-executive directors on the board
Gender diversity	GD	% of female directors on the board
Board expertise	BDEXP	% of directors affiliated with a professional body
Institutional ownership	INSOWN	Proportion of common stock owned by institutional investors
Family ownership	FAMOWN	Proportion of ownership by family members
Foreign ownership	FOROWN	Proportion of ownership by foreign investors
Firm size	SIZE	Natural logarithm of total assets
Firm growth	GRT	Changes in sales (%)
Return on assets	ROA	Net income divided by average total assets
Leverage	LEV	Ratio of debt to assets
Audit quality	AQ	Dummy variable that equals 1 if the auditor is one of the Big Four, and 0 otherwise

4.3. Accruals Management Model Justification

It has been found from previous studies that the modified Jones model (Dechow, Sloan, & Sweeney, 1995) is more appropriate for accruals estimation. Nevertheless, the study by Yoon and Miller (2002) has shown that the modified Jones model does not fit well for Korean or Asian firms. Their study found that the extended modified Jones model is more appropriate than other accruals estimation models. Accordingly, this study proposed its model for accruals estimation which is also used by other researchers in recent studies (Hasan, 2020; Hasan, Hossain, Rekabder, Molla, & Ashif, 2022; Hasan & Rahman, 2017; Hasan, Rahman, Sumi, Chowdhury, & Miraz, 2020; Islam, Ali, & Ahmad, 2011). Equations 5 and 6 exhibit the methodical decomposition of the extended modified Jones model.

$$TA_i/REV_i = \beta_0 + \frac{\beta_1(\Delta REV_i - \Delta REC_i)}{REV_i} + \frac{\beta_2(\Delta EXP_i - \Delta PAY_i)}{REV_i} + \frac{\beta_3(DEP_i + PEN_i)}{REV_i} + \varepsilon_i \quad (5)$$

Where, TA (total accruals) = accounting earnings – cash flow from operations (CFO).

REV = Net sales revenue in period t.

ΔREV = Changes in net sales revenue.

ΔREC = Changes in trade receivables.

ΔEXP = Changes in the sum of the cost of goods sold and selling & administrative expenses without cash expenses.

ΔPAY = Changes in trade payables.

DEP = Depreciation expenses.

PEN = Retirement benefits expenses.

Δ = Change operator.

$$DA_i = (TA_i/REV_i) - [b_0 + \frac{b_1(\Delta REV_i - \Delta REC_i)}{REV_i} + \frac{b_2(\Delta EXP_i - \Delta PAY_i)}{REV_i} + \frac{b_3(DEP_i + PEN_i)}{REV_i}] \quad (6)$$

5. ANALYSIS AND FINDINGS

5.1. Descriptive Analysis

Table 2 presents a comprehensive summary of mean, standard deviation, minimum, and maximum values of the 13 independent and dependent variables. This study employed panel data of 159 firms comprising 795 observations for five years, from 2016 to 2020, to empirically examine the relation between board variables (BDSIZE, BDIND, GD, and BDEXP), ownership structure (INSOWN, FOROWN, and FAMOWN), and accruals management (AM). A few observations are noteworthy. Firstly, the mean forecast spread between the minimum and maximum values of discretionary accruals (DA) denoting accruals management is significant, with values of 0.0007 and 84.920, respectively, and a mean value of 1.574.

This observation signifies that some firms within the sample predominantly undertake accruals management, while some limit such practices. Secondly, the mean values of the board variables of size, gender diversity, independence, and expertise are 7.193, 1.306, 1.825, and 0.381, respectively. The panel data indicates that the minimum and maximum numbers of board members in the sample are 4 and 17, respectively, with a maximum of five members being independent and female.

Furthermore, the number of professional members within the firm, as measured by board experience (BDEXP), has a mean value of 0.381, with a range of 0–3. The mean values corresponding to the proportion of common shares retained by institutional, foreign, and family ownership are 0.164, 0.057, and 0.288, respectively, with minimum and maximum values ranging from 0 to 1.

Furthermore, it should be noted that the average (mean) level of the natural logarithm of average total assets, represented by the variable SIZE, is 9.515, exhibiting a moderately low standard deviation of 0.667. This finding suggests that the values of average total assets are clustered around the mean. In addition, the lowest values for ROA and growth are -4.051 and -1, respectively, demonstrating that the collected observations have firms with negative ROA and sales.

The descriptive statistics provide valuable insights into the leverage (LEV) value, which is found to have a relatively small range. The lowest value of LEV is -1.504, and the maximum value is 3.421, suggesting that some firms within the dataset are more highly leveraged than others. This finding aligns with the studies by Humayun, Sharma, Islam, and Salat (2011); Muttakin, Khan, and Mihret (2017) and Hasan et al. (2020). Moreover, the GRT variable exhibits similar trends with varying degrees of variations and range.

Finally, the descriptive statistics provide information about audit quality (AQ), which denotes whether firms are audited by one of the Big Four audit firms or not. The mean value of AQ is 0.140, with a corresponding standard deviation of 0.238. This result is consistent with recent studies by Muttakin et al. (2017) and Hasan et al. (2022).

Table 2. Descriptive statistics (N = 159, t = 5, obs. = 795).

Variable	Mean	Std. deviation	Minimum	Maximum
DA	1.574	5.661	0.0007	84.9206
BDSIZE	7.193	2.144	4	17
GD	1.306	1.160	0	5
BDIND	1.825	0.774	0	5
BDEXP	0.381	0.571	0	3
INSOWN	0.164	0.167	0	0.95
FOROWN	0.057	0.171	0	0.965
FAMOWN	0.288	0.225	0	1
SIZE	9.515	0.666	7.615	11.466
ROA	0.036	0.173	-4.051	0.655
LEV	0.448	0.306	-1.504	3.421
GRT	0.077	0.614	-1	10.880
AQ	0.060	0.238	0	1

5.2. Correlation Matrix and Variance Inflation Factor (VIF)

Table 3 presents a correlation matrix that measures the degree of the linear relationship between each pair of variables associated with board characteristics, ownership structure, and discretionary accruals. The results from the correlation matrix indicate that gender diversity (GD), institutional ownership (INSOWN), family ownership (FAMOWN), foreign ownership (FOROWN), firm size (SIZE), firm growth (GRT), and return on assets (ROA) have a significant negative correlation with discretionary accruals (DA).

This suggests that firms that utilize discretionary accruals as a representative of earnings management tend to have a lower level of gender diversity, and firms with higher levels of institutional, foreign, and family ownership tend to have a lower propensity to engage in earnings management. On the other hand, board independence and leverage exhibit a significant positive correlation with DA and board size. However, the correlation coefficient is lower than 0.57.

Furthermore, the correlation matrix confirms that none of the study variables has a correlation exceeding 56%. The highest correlation observed in the study is between board size and discretionary accruals (0.561), followed by the correlation between the dummy variable of audit quality and foreign ownership (0.497). Therefore, the likelihood of encountering multicollinearity among the study variables is nominal.

The present study utilized a winsorizing technique at the 1% and 99% levels to mitigate the issue of multicollinearity among its variables, drawing from prior research conducted by Hasan et al. (2020); Zhang, Zhang, Zheng, and Aerts (2021); Routledge (2020) and Hasan et al. (2022).

This approach is implemented to enhance the reliability of the study's findings. Additionally, the study employed the VIF and tolerance values (presented in Table 4) as a precautionary measure to eliminate possible outliers, even though previous studies (Allison, 2012; Hasan et al., 2022; Hasan, Molla, & Khan, 2019) suggest that multicollinearity in large sample datasets should not be a problem.

The VIF and tolerance results indicate that all the values are within the range of 1.02 to 1.72, with a mean of 1.31, which suggests that the variables are moderately correlated. Other literature suggests, as a rule of thumb, that the VIF value should be within the range of 5–10, and a VIF over ten indicates high correlation (Daoud, 2017; Hasan, 2020; Hasan et al., 2022). This outcome further supports the findings from the tests employed above; hence, we can conclude that the issue of multicollinearity is not present in the dataset and we can proceed to test for normality and endogeneity.

Table 3. Correlation matrix.

Variable	DA	BDSIZE	GD	BDIND	BDEXP	INSOWN	FOROWN	FAMOWN	SIZE	ROA	LEV	GRT	AQ
DA	1.000												
BDSIZE	-0.045	1.000											
GD	-0.083**	0.202***	1.000										
BDIND	0.094***	0.561***	0.120***	1.000									
BDEXP	0.017	0.168***	-0.028	0.093***	1.000								
INSOWN	-0.091***	0.078**	0.078**	-0.0009	0.141***	1.000							
FOROWN	-0.015	0.211***	-0.016	0.111***	0.024	-0.146***	1.000						
FAMOWN	-0.073**	0.009	0.242***	0.058*	-0.063*	-0.145***	-0.285***	1.000					
SIZE	-0.103***	0.297***	-0.048	0.128***	0.210***	0.281***	0.233***	-0.030	1.000				
ROA	-0.169***	0.042	-0.013	0.045	-0.038	0.016	0.168***	-0.034	0.107***	1.000			
LEV	0.167***	0.080**	-0.158***	0.046	0.146***	-0.038	0.053	0.056	0.027	-0.113***	1.000		
GRT	-0.070**	0.049	-0.032	0.005	0.049	0.005	-0.014	0.012	0.012	0.052	-0.018	1.000	
AQ	-0.002	0.258***	0.051	0.203***	0.112***	-0.114***	0.497***	-0.151***	0.236***	0.263***	0.077**	0.016	1.00

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 4. VIF and tolerance values.

Variable	Model 1		Model 2		Models 3 & 4	
	VIF	Tolerance value	VIF	Tolerance value	VIF	Tolerance value
BDSIZE	1.70	0.587	-	-	1.72	0.581
GD	1.11	0.901	-	-	1.22	0.822
BDIND	1.44	0.694	-	-	1.45	0.689
BDEXP	1.07	0.931	-	-	1.08	0.924
INSOWN	-	-	1.17	0.853	1.21	0.827
FOROWN	-	-	1.57	0.638	1.59	0.629
FAMOWN	-	-	1.15	0.871	1.27	0.787
SIZE	1.20	0.833	1.22	0.821	1.33	0.750
ROA	1.14	0.875	1.18	0.846	1.19	0.838
LEV	1.09	0.919	1.05	0.949	1.11	0.897
GRT	1.01	0.987	1.01	0.992	1.02	0.984
AQ	1.19	0.837	1.40	0.713	1.47	0.678

5.3. Normality Test

In regression analysis, it is essential to ensure that the model satisfies certain assumptions for the validity of the results. Two key assumptions are the absence of omitted variables and the normally distributed population from which sample data was drawn. To test for these assumptions, the present study employed three tests: The normal distribution of residuals test, the Jarque–Bera normality test, and the Ramsey RESET test. The normal distribution of residuals test is conducted to evaluate the normality of the data. The results, as shown in Figure 2, indicate that the data is normally distributed and free from any abnormality. Additionally, Table 5 presents the results of the Jarque–Bera normality test and the Ramsey RESET test. The Jarque–Bera normality test yielded an insignificant p-value, indicating that the null hypothesis of the normal distribution is accepted. Finally, the Ramsey RESET test is performed to detect the presence of any omitted variables or any endogeneity problem in the model. The results revealed that the model is free of any such problem, with an insignificant p-value (Prob. > F = 0.116), indicating that the null hypothesis was accepted and any model misspecification problems were unlikely. This outcome aligns with previous studies (Adib, Xianzhi, & Eiris, 2019; Hasan et al., 2022; Ramsey, 1969), indicating that the Ramsey RESET test is reliable for model specification. Overall, the results of the three tests suggest that the model satisfies the necessary assumptions for regression analysis, and therefore, the results obtained can be considered reliable.

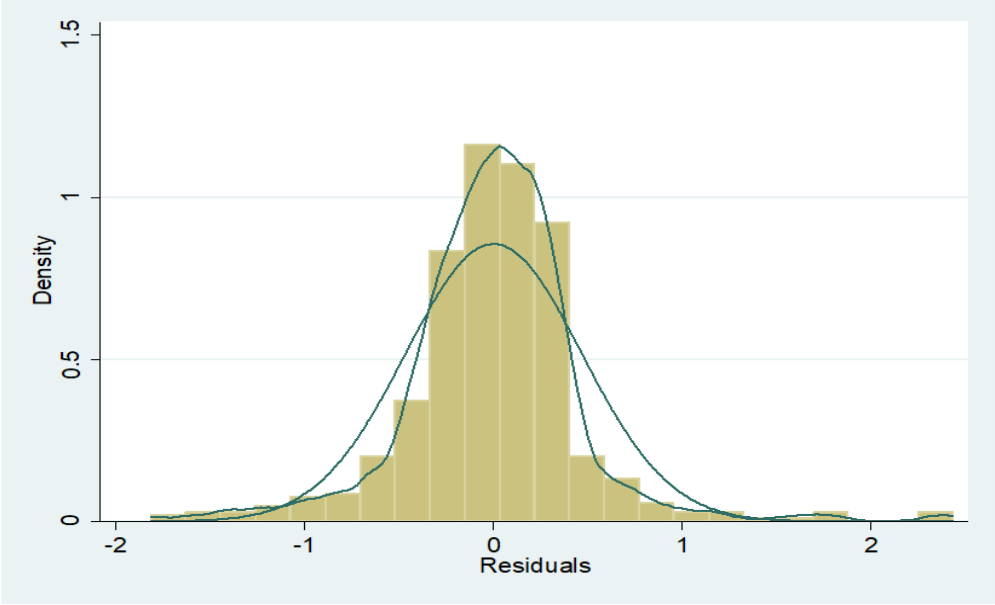

Figure 2. Normal distribution of residuals.

Note: Bin = 23, Start = -1.972, Width = 0.193.

Table 5. Normality test.

Test	Outcome
Jarque–Bera normality test	Jarque–Bera normality test: 367.1 Chi (2) 3.e-123 Jarque–Bera test for Ho: normality
Ramsey RESET test	Ho: The model has no omitted variables F (3, 713) = 1.96 Prob. > F = 0.116

5.4. Test for Heteroskedasticity

In addition to normality test, it is crucial to establish that the residuals have constant variance, known as homoskedasticity, rather than heteroskedasticity, indicating that the residuals have unequal variance. To investigate this issue, we plotted the residuals against the fitted values and observed a few unequal scatters of residuals. Additionally, we performed the Breusch–Pagan/Cook–Weisberg test, and the results are presented in Table 6. The p-value of the test was 0.00, smaller than the significance level of 0.05. Therefore, the null hypothesis of the constant variable is rejected, suggesting that heteroskedasticity exists within the data gathered. Figure 3 also illustrates the residuals against the fitted values of the data.

Table 6. Breusch–Pagan/Cook–Weisberg test.

Test	Outcome
Breusch–Pagan/Cook–Weisberg test for heteroskedasticity	Ho: Constant variance Variable: Fitted value of DA Chi2(1) = 1473.39 Prob. > chi2 = 0.0000

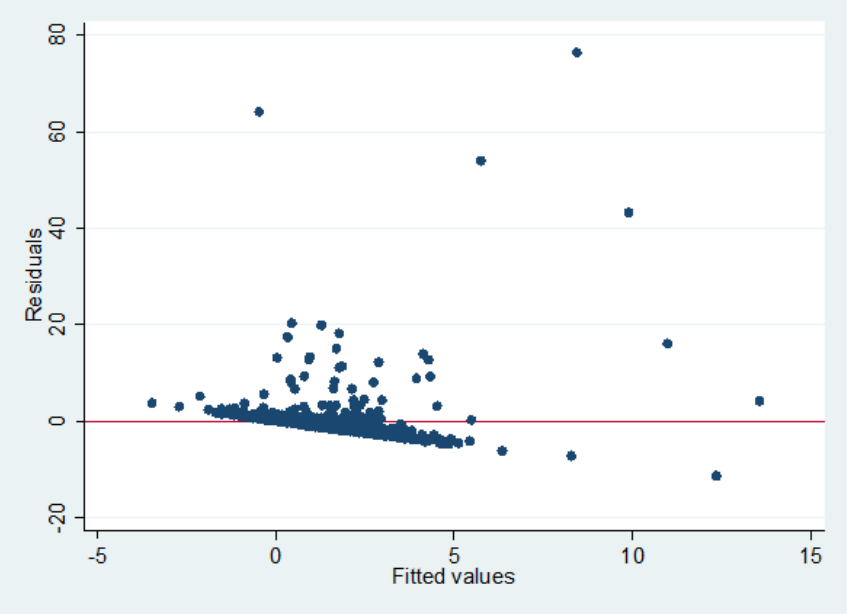

Figure 3. Plot of the residuals.

5.5. Information Matrix Test (Estat Imtest)

The current study has identified potential issues with the sample data based on the results of the Ramsey RESET test and the test for heteroskedasticity. While the test for multicollinearity and VIF showed a favorable outcome, it is essential to investigate these issues further to ensure the model's validity. To address this issue, the study has implemented Cameron and Trivedi's decomposition of imtest, which aims to identify the violation of any fundamental assumptions associated with a linear regression model.

Table 7. Information matrix test.

Test	Outcome
Cameron and Trivedi's decomposition of imtest	White's test for Ho: Homoskedasticity Against Ha: Unrestricted heteroskedasticity Chi2(89) = 317.45 Prob. > chi2 = 0.0000

The statistical test results reported in Table 7 provide a valuable insight into the potential presence of heteroskedasticity in the model. Specifically, the results of Cameron and Trivedi's decomposition of imtest shows a p-value of 0.000, which suggests evidence against the null hypothesis of homoscedasticity. This result implies that dependent variable is likely to vary across various levels of the independent variable in the model. To address this issue, the study will proceed with the Breusch and Pagan LM test and the Hausman specification test to determine the suitability for further analysis.

5.6. Breusch and Pagan LM (Lagrange multiplier) Test and Hausman Specification Test

The pooled ordinary least squares (OLS), fixed effects, and random effects models are the three primary models in the model specification process for data analysis. The first step in the model selection procedure involves comparing the pooled OLS and random effects models to identify the most appropriate model for the data under investigation. Corresponding to this approach, the Breusch–Pagan test is conducted to inspect the cross-sectional dependency in the data (Breusch & Pagan, 1980). Table 8 presents the results of the Breusch and Pagan LM test and the Hausman specification test. The results indicate a chibar2(01) statistic of 125.36 with a probability (p-value) of 0.00, rejecting the null hypothesis. This result is reinforced by the significant p-value of the test, which indicates the presence of cross-sectional dependence in the data (Baltagi, Feng, & Kao, 2012; Hasan et al., 2022; Molla et al., 2021). Hence, the random effects model is found to be the most suitable for the data at hand. Following the Breusch and Pagan test, the next step is to run the Hausman specification test to assess whether the difference in coefficients between models is methodical. The results show a chi2 statistic of 15.92 with a p-value of 0.1948, thus failing to reject the null hypothesis that the coefficient differences are not systematic. Therefore, the random effects model is the preferred choice for the panel data in the model.

Table 8. Breusch and Pagan LM test and Hausman test results.

Breusch and Pagan LM test	Hausman specification test
Test: Ho: There is no cross-sectional dependence Var(u) = 0 Chibar2(01) = 125.36 Prob. > chibar2 = 0.0000	Test: Ho: The difference in coefficients not systematic Chi2(12) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B) = 15.92 Prob. > chi2 = 0.1948

5.7. Regression Analysis

The study engaged the random effects generalized least squares (GLS) regression model to improve estimation and address heteroscedasticity. As illustrated in Table 9, the findings indicate a substantial positive correlation between board size (with a significance level of 5% and a coefficient of 0.0273) and board independence (with a significance level of 5% and a coefficient of 0.522) with accruals management. This finding is consistent with the evidence provided by Bradbury, Mak, and Tan (2006); Kumari and Pattanayak (2014) and Lai and Tam (2017), which advocates a noteworthy positive relationship between board size and the practice of accruals management. In contrast, there is significant negative relationship between gender diversity (with a significance level of 10% and a coefficient of -0.515), institutional ownership (with a significance level of 5% and a coefficient of -0.116), and family ownership (with a significance level of 10% and a coefficient of -0.061) with accruals management. This indicates that the

inclusion of females on the board lessens the practice of accruals management, which is in line with the findings of Enofe, Iyafekhe, and Eniola (2017); Kim and Jeong (2018) and Bansal (2022).

Table 9. Results of the random effects generalized least squares (GLS) regression model.

Variable	Model 1	Model 2	Model 3	Model 4
BDSIZE	-0.329** (0.157)	-	-0.313** (0.157)	0.0273** (0.327)
GD	-0.464* (0.249)	-	-0.325 (0.257)	-0.515* (0.582)
BDIND	0.657*** (0.393)	-	0.670*** (0.392)	0.522** (0.807)
BDEXP	0.276 (0.520)	-	0.242 (0.518)	-0.739 (0.199)
INSOWN	-	-0.706** (0.890)	-0.267* (0.912)	-0.116** (0.518)
FOROWN	-	-0.794 (0.990)	-0.434 (0.008)	0.508 (0.655)
FAMOWN	-	-0.640** (0.332)	-0.301* (0.389)	-0.061* (0.489)
BDSIZE*INS	-	-	-	-0.353 (0.015)
GD*INS	-	-	-	0.593 (0.635)
BDIND*INS	-	-	-	0.053 (0.014)
BDEXP*INS	-	-	-	0.983 (0.619)
BDSIZE*FOR	-	-	-	-0.629 (0.099)
GD*FOR	-	-	-	0.0692 (0.843)
BDIND*FOR	-	-	-	0.263 (0.570)
BDEXP*FOR	-	-	-	0.893** (0.256)
BDSIZE*FAM	-	-	-	-0.124 (0.736)
GD*FAM	-	-	-	0.210 (0.154)
BDIND*FAM	-	-	-	0.874** (0.851)
BDEXP*FAM	-	-	-	0.062 (0.753)
SIZE	-0.935** (0.466)	-0.612 (0.470)	-0.687 (0.486)	-0.812 (0.509)
ROA	0.865 (0.357)	0.512 (0.399)	0.136 (0.387)	0.445 (0.419)
LEV	0.646*** (0.820)	0.068*** (0.812)	0.720*** (0.822)	0.898*** (0.842)
GRT	-0.210 (0.285)	-0.235 (0.289)	-0.212 (0.285)	-0.245 (0.286)
AQ	-0.0580 (0.037)	-0.165 (0.099)	-0.291 (0.105)	-0.610 (0.145)
Constant	0.989** (0.312)	0.331* (0.357)	0.550* (0.431)	0.795* (0.015)
R-squared	0.411	0.251	0.459	0.552
Observations	795	795	795	795
Number of companies	159	159	159	159

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are in parentheses.

The presence of institutional and family ownership reduces the extent of accruals management in Bangladeshi firms, which replicates the findings of Wang (2006); Mousavi, Salehi, Abbasi, and Farhangdoust (2018) and Ajay and Madhumathi (2015). The research findings also unveil that foreign ownership (0.893, significant at a 5% level)

expressively and positively controls the relationship between board expertise and accruals management. This indicates that the presence of foreign ownership with board expertise increases the likelihood of higher accruals management. Additionally, this study documents that family ownership significantly positively moderates the relationship between board independence and accruals management (with a significance level of 5% and a coefficient of 0.874), implying that family ownership increases the possibility of higher accruals management. Similar outcomes have been documented by Alzu'bi and Ramli (2022) and Dyussembina, Park, and Choi (2023). Furthermore, organizational changes, such as total assets (SIZE), sales revenue (GRT), and audit quality (AQ), are negatively correlated with accruals management. In contrast, return on assets (ROA) and leverage (LEV) are positively correlated with accruals management. However, when used as a control variable, only LEV shows a significant positive relationship with accruals management.

6. CONCLUSION

The results of this study are based on data collected from non-financial Bangladeshi firms covering a five-year period, from 2016 to 2020. The study was conducted to determine the effect of board characteristics on accruals management with the moderating role of ownership structure. According to the researcher's observations, findings and knowledge, this study is among the limited number of studies that have discovered how the ownership structure regulates the connection between board-related factors and accruals management. The study revealed that both board size and board independence have a strong positive association with accruals management, whereas gender diversity is significantly and negatively associated with accruals management. It is also acknowledged that institutional and family ownership both have a significant negative influence on accruals management. Furthermore, the study discloses that foreign ownership has significant positive control of board expertise and accruals management, and that family ownership has significant positive control of board independence and accruals management. The outcome of this study will help policy makers and controlling authorities, such as securities and exchange commissions, in outlining corporate governance policies and procedures required to enrich the earnings quality of firms. Likewise, this study will create possibilities for future research on the impact of ownership structures and corporate governance on accruals management and will assist policy makers, creditors, investors and controlling bodies to mitigate agency problems.

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