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Gender diversity and earnings management: Evidence from Bangladesh

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Abstract

This study aims to evaluate the impact of Gender-diversity on earnings manipulation using both accrual and real earnings management techniques. All the data has been gathered from yearly reports of recorded non-financial organizations in Bangladesh from 2011 to 2019; after necessary diagnostic checking, this study finally uses the OLS regression model to evaluate the relationship. Findings show that the non-financial organizations of Bangladesh are practicing both forms of earnings management simultaneously. Evidence illustrates that female directors on the board have no significant association with any proxies of accrual earnings management but are significantly positively associated with abnormal discretionary expenses. Moreover, the gender diversity of CEOs is negatively connected with abnormal production costs and positively associated with abnormal cash flow from operating activities, and the relationship is statistically significant. Policymakers and other stakeholders can use these findings to give more concentration on the issue of women's involvement at the corporate level and the development of governance issues.

Keywords Female director, Gender-diverse CEO, Earnings management, Non-financial Organization, Bangladesh

Paper type Research paper

1. Introduction

Manipulation of Earnings is an intentional mechanism instigated by managers of organizations to realize financial benefits from the commercial center (Schipper, 1989). Sometimes executives take part in unscrupulous earnings treatment for their benefits (Bergstresser & Philippon, 2006) and to generate some expected affluence of the organization (Degeorge, Patel, & Zeckhauser, 1999). It may happen due to fragile corporate governance arrangement and company control system, indeed functional corporate governance mechanisms guide a firm to augment quality in business transactions and lessen the chance of earnings management. In contrast, weak corporate governance augments opportunities for handling, dishonesty, and unprofessional conduct in the business (Almasarwah, 2015; Chowdhury,

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Othman, Khan, & Sulaiman, 2020). Consistent with this, whether corporate governance mechanism (gender-diversity) does have any relationship with earnings management has been an issue of the extreme contest and a center of many former pieces of research. Unlike research that has been conducted in this regard but tends to confine the corporate governance measurement tools and earnings management. Most of the studies have been used board-size, board meetings and relate them to accrual or real earnings management in a different economy (Haniffa, Rahman, & Ali, 2006; Ball & Shivakumar, 2008; Obigbemi, Omolehinwa, Mukoro, Ben-Caleb, & Olusanmi, 2016), but e-association between gender diversity and earnings manipulation are very few. Moreover, (Fields, Lys, & Vincent, 2001) stated that only a particular earnings management system will not correspond to the overall effects of earnings management activities. In agreement with this, previous studies illustrate a negative association between female directors and earnings management, others document no relation between CEO gender and earnings management (Hili & Affess, 2012). These findings shed some light for further research on Earnings management techniques and the number of female directors in the board structure and female CEO. Therefore, the primary aim of this study is to extend the literature and examine whether this study holds the outcomes of previous researches by using these two components of corporate governance in a developing economic setting (Chowdhury, Othman, Khan, & Sulaiman, 2020; Khan, Bhuiyan, Hoque, & Molla, 2015). Our study uses accrual as well as real earnings management as the dependent variable; the independent variables are female directors in the boardroom and CEO gender. The study uses a range of control variables based on previous researches, as well as the year and industry dummy variables. Overall, I consider 1062 firm-year observations from non-financial organizations of Bangladesh. Initially, Modified Jones Model (Dechow, Sloan, & Sweeney, 1995) is used to measure accrual earnings management, and for real earnings, management study uses the abnormal cash flow from operating activities (CFO), abnormal production cost (PROD), and abnormal discretionary accruals (DISC) as per Roy Chowdhury model (Roychowdhury, 2006), then, the paper determine overall real earnings management by summarizing three proxies. Evidence demonstrates that our empirical models are well specified and comparable with previous results. However, our main results illustrate that, Firstly, overall, both earnings management positively and significantly linked with each other in all the models. This indicates that non-financial organizations of Bangladesh are using both forms of earnings management simultaneously. Non-Financial organizations of Bangladesh are practicing

both forms of earnings management simultaneously. Evidence shows that female director on the board has no significant association with any proxies of accrual earnings management, but are significantly (at 5% level) positively associated with abnormal discretionary expenses. Moreover, the gender diversity of the CEO is negatively connected with abnormal production cost (R_PROD) and positively associated with abnormal cash flow from operating activities (R_CFO), and the relationship is statistically significant at 10% level and 5% level respectively. Our study contributes to the existing literature in various ways; first, so far, our knowledge goes no study yet considered gender-diversity to make a relationship with earnings management in the context of Bangladesh. Second, the maximum study only considered one earnings management technique, but our study fills this gap by addressing both methods.

Our study based on the data from emerging economy, Bangladesh. Bangladesh the 39th biggest economy within the world, it features a GDP of more than US$300 billion, its populace of more than 160 million individuals involves a generally little range, as it were 144000 square kilometers (Naoaj, Khan, & Ahsan, 2021). According to World Bank report (World Bank, 2009) shows that the capital market of Bangladesh is not developed as expected, and the economic monitoring and enforcement are below the standard (Siddiqui, 2010) as well as export-oriented organizations is the main sources of the financial well-being of Bangladesh (Islam & Deegan, 2008). But the recent report of Bangladesh Bank shows that the capital market has seen several regulation and administrative headways which has come about expanded capital market mediators, "such as; Stock Exchanges; Central Depository, Stock Dealer/Sock Broker, Merchant Banker & Portfolio Manager, etc" (Amit, 2017). World economic forum (The World Economic Forum, 2019) depicted that Bangladesh is urbanizing rapidly. By 2030 48% of the citizens will enjoy the flavor of the town. Workable people will be dexterous, open to modern thought, and explore other ways of making riches. In reality, typically as of now happening with over 110 million dynamic web supporters in Bangladesh, by 2025, portable web infiltration will reach 41% populace. Fast urbanization, encouraged by expanding utilization of power and more than 30 million people will get a market to change their economic condition. These blooming economies of Bangladesh attract lot of foreign and national investors showing their interest in various sectors, such as manufacturing, service and financial sector. The firm's report on which investors heavily rely is the financial statement. So accurate financial reporting is crucial for making an effective signal in the market. Therefore, the impact of a female director and CEO on this aspect is very

crucial to investigate in the context of Bangladesh. As a result, a study in this connection is essential to figure out the actual scenario of earnings handling and the impact of gender-diversity to reduce it in the context of the emerging economy, Bangladesh.

The rest of the paper is designed as follows; Section 2 develops and explains all possible demonstrable hypotheses. Part 3 gives a detailed research design including sample selection, variable measurement and setting of the empirical model. Segment 4 demonstrates descriptive statistics, correlation analysis, and main findings. Part 5 shows additional analysis and robustness checks. Section 6 illustrates the conclusion.

2. Literature review and hypothesis development

2.1. Gender-diverse boards and earnings management

For years gender diversity is a common phenomenon informing corporate Boards, though Norway is the first country mandated a portion of a female director, but having seen affirmative development of laws and regulations for female representation in several nations, "including Belgium, France, Iceland, Italy, Norway, Spain, and the Netherlands" (Groysberg & Bell, 2013). It is obvious that the thinking power, workability, and common behavior of male and female are different, however, to deal with the financial aspects of the organization, female tends to support others while men concentrated on profitability and career development. Moreover, to record revenue expenditure gens are more likely than ladies to violate corporate and accounting guidelines to maximize profit (Betz, O'Connell, & Shepard, 1989). Similarly, research evidence demonstrates that the tendency of women involved with earnings management is comparatively lower than men due to the interest in practicing professionalism (Terjesen, Sealy, & Singh, 2009; Kaplan, Pany, Samuels, & Zhang, 2009). Based on moral standard and consciousness some studies pointed out that on average female accountant shows greater accountability than male (Bernardi & Arnold, 1997), because they show reluctances to augment economic returns through unethical ways due to huge loathing for taking risks (Kaplan, Pany, Samuels, & Zhang, 2009), furthermore, for making economic decision girls are more flexible and sensitive compare to boys (Byrnes, Miller, & Schafer, 1999; Powell & Ansic, 1997). In contrast, Harakeh, El-Gammal, & Matar, (2019) illustrated that to supplement financial benefits and professional status female directors may involve manipulation by compromising quality. Consistent with the above views, research evidence shows that there is a negative association between gender-diverse boards and earnings management (Peni & Vahamaa, 2010).

Similarly, Gul, Srinidhi, and Ng (2011) pointed out that if a company falls upon the risk of earnings management, then qualified female directors can handle this phenomenon by using a conservative approach. Based on the above discussion it has been crystal clear that the presence of female directors in the boards might be remunerative for the company to handle earnings management, thus, the study proposes the hypothesis as follows:

H1: There is a significantly positive association between gender-diverse boards and earnings management

2.2. CEO gender and earnings management

Whether gender-diversity does have any relationship with earnings management has been a matter of great discussion towards the organization. Recent research demonstrates that women are more ethically sound than men and are conscious about the company's prospects (Barua, Davidson, Rama & Thiruvadi, 2010). Findings also depicted that ladies show reluctance to augment economic returns through unethical ways due to huge loathing for taking risks (Kaplan, Pany, Samuels, & Zhang, 2009). Two schools of thought exist in the literature about this issue. First of all, female CEO is less likely to take the riskier project and capital market opportunities (Faccio, Marchica, & Mura, 2016), as well as try to depend on conservative approach (Schubert, 2006). As a result, firms having feminine CEOs are less likely to depend on borrowed money to make investment strategies and try to maintain linear earnings. Secondly, comparatively, CEO ladies are more sensitive about the pulse of the client (Brennan & McCafferty, 1997), and situational decision making (Gavious, Segev, & Yosef, 2012) than gents. Consequently, Gavious, Segev, and Yosef (2012) found that there is a positive association between CEO females and earnings management. Thirdly, according to organizational theory, Bouaziz, Salhi, and Jarboui (2020) pointed out that firms having females in top executive positions are successful in the profitability index. Further research of Hili and Affess (2012) and Guedes, Gaio, and Soares (2018) show the "non-linear relationship" between CEO gender diversity and earnings management. Additionally, an empirical study on the listed firms of France shows that "female directors and earnings management is negatively correlated" (Bouaziz, Salhi, & Jarboui, 2020). Based on the above evidence the following hypothesis is proposed:

H2: There is negative relationship between CEO gender and earnings management in the Non-financial organizations of Bangladesh.

3. Research design

3.1. Sample selection & data collection

The examination is mostly depending on secondary information. Table 01 shows a description of the overall sample of our study. All the data has been gathered from yearly reports of recorded non-financial organizations of Bangladesh over the periods from 2011 to 2019. Moreover, the study period begins in 2011 because of the discrepancy of necessary data for all proxies. There are 586 listed firms in Bangladesh, out of which 198 are non-financial organizations. Because of the nature of transactions and separate regulations, this study has excluded financial organizations. Initially, our study considered 1782 firm-year observations, but I exclude 720 firm-year views as some of the companies established after 2011 and of missing information and unavailability of the annual report. Finally, 118 firms under thirteen industries, including Cement, Ceramics, Textile, Tannery, Paper & Printing, Pharmaceuticals, Service and real estate, Food, Engineering, Power, Miscellaneous, & Information technology, have been fixed for empirical analysis. All information has been collected manually from the annual reports to make a reliable and accurate analysis.

Table 1: Description of study samples

Panel A: Sample	
Selected companies	198
Number of company-year	1782
Less: Firm-year lack of information	720
Total sample (Firm-year)	1062
Panel B: Industry-wise allocation	
Various sectors	No. of Firm-year
Cement industry	63
Ceramics industry	45
Engineering industry	144
Textile industry	288
Food industry	81
Power industry	108
Pharmaceuticals	180
IT	36
Services & Real Estate	36
Telecommunication	9
Tannery	18
Miscellaneous	36
Paper and printing	18
Total	1062

Note: Panel A contains a sample that I finally have considered for the study, Panel B explains sector-wise representatives.

3.2. Measurement of accrual-based earnings management

In this segment, I measure the manipulation of discretionary and non-discretionary accruals. However, discretionary accruals illustrate the specification of discretionary costs. An expected conveyance allowance for management is not incurred but recorded in the journal books. While non-discretionary accruals are defined as advance recording, a necessary expense is not happening but recorded in the company's accounting statement, such as; expected Research & Development expenses or gratuities (Business Dictionary, 2017a; Business Dictionary, 2017b; Chang, Liang, & Yu, 2019). Our study considers discretionary accruals as an empirical substitute for earnings handling. Therefore, according to Dechow, Sloan & Sweeney (1995) I use the "Modified Jones model" as a proxy for earnings management. The model is as follows:

$$TAC_{i,t} = NOPI_{i,t} - CFO_{i,t} \quad (1)$$

The above equation depicts total accruals equals net operating income minus cash flow from operating activities. Yet, 'i,t' stands for firm(i) and t for year.

Non-discretionary accruals (NDAC) as:

$$TAC_{i,t} / TA_{i,t-1} = \beta_1 (1/ TA_{i,t-1}) + \beta 2 (\Delta REV_{i,t} - \Delta REC_{i,t}) / TA_{i,t-1} + \beta 3 (PPE_{i,t-1} / TA_{i,t-1}) + \boldsymbol{\varepsilon}_{i,t} \quad (2)$$

Total accruals (TAC) equals' income before the particular articles minus operating cash flows.

However, a change in net revenues (ΔREV) is the difference between incomes in year t and those in year t−1. ΔREC stands for change in receivable. The gross estimation of property, plant and equipment (PPE) included controlling for customary devaluation costs. T.A. represents Total Asset, and $\boldsymbol{\varepsilon}_{i.t}$ outlines arbitrary mistakes.

Discretionary accruals (DAC) define as follows:

$$\mathbf{DAC_{i,t} = TAC_{i,t} - NDAC_{i,t}} \quad (3)$$

Discretionary accrual (DAC) equals total accruals minus non-discretionary accruals.

3.3. Measurement of real-activity based earnings management

To increase or decrease recorded earnings, managers bring about this type of activity through controlling "cash flow from operating activities, production,

and discretionary expenses" (Roychowdhury, 2006). Initially, Sales management involves swelling sales through various incentives like; discounts, after-sales service, and several credit facilities, consequently, lowering cash flows due to irregular margin reduction. On the other hand, overproduction increases manufacturing costs; thus, the reduction of discretionary expenses amplifies operating cash flows (Lemma, Negash, Mlilo, & Lulseged, 2018). Previous studies use "abnormal cash flows, production costs, and discretionary expenses as proxies for real earnings management" (Lemma, Negash, Mlilo, & Lulseged, 2018; Gunny, 2010). Abnormal indicates the differences between "actual & expected outcomes of cash flow, production cost, and discretionary expenses" (Lemma, Negash, Mlilo, & Lulseged, 2018). Consistent with previous studies (e.g., Roychowdhury, 2006; Lemma, Negash, Mlilo, & Lulseged, 2018; Laksmana & Yang, 2014), I also measure cash flow from operating activities, Production cost, and discretionary cost according to (Dechow, Kothari, & Watts, 1998) model. The study calculates real earnings management by the following equations.

The first model is used to compute abnormal cash flow from operating activities (R_CFO) by netting in service money flow less than the predictable networking cash flow for every company (every year). The first model is as follows:

$$CFO_{i,t} / ASSET_{i,t-1} = \beta_1 (1/ASSET_{i,t-1}) + \beta_2 (SALES_{i,t} / Asset_{i\,t-1}) + \beta_3 (\Delta SALES_{i,t} / ASSEt_{i,t-1}) + \varepsilon_{i,t} \quad (4)$$

Where CFO stands for net operating cash flow and asset denotes a single period lagged value of the total asset, and ΔSALES refers to the overall sales value changes. Following model is applying to calculate production cost and regressed for each firm:

$$PROD_{i,t} / ASSET_{i,t-1} = \beta_1 (1/ASSET_{i,t-1}) + \beta_2 (SALES_{i,t} / Asset_{i\,,t-1}) + \beta_3 (\Delta SALES_{i,t} / ASSET_{i,t-1}) + \beta_4 (\Delta SALES_{i,t-1} / ASSET_{i,t-1}) + \varepsilon_{i,t} \quad (5)$$

Where, PROD indicates the sum of the cost of merchandise sold and change in stocks. At last, abnormal production cost (R_PROD) is estimated by taking the contrasts between the evaluated estimation of manufacturing costs from the Sum of the Cost of items sold and the adjustment in stock for each firm. As indicated by the accompanying model, I at first measure discretionary expenses utilizing the following model:

$$DISC\ Expense_{i,t} / ASSET_{i,t-1} = \beta_1 (1/ASSET_{i,t-1}) + \beta_2 (SALES_{i.t-1} / Asset,_{t-1}) + \varepsilon_{i,t} \quad (6)$$

Where, DISC refers to Research & Development and selling and administrative expenses in the profits and loss statement. Then, abnormal discretionary expenses (R_DISC) are estimated by taking the differences between the predicted value of discretionary cost and the amount of other in-service items expenses. According to the above three models, I generate an overall measure of earnings management for each firm.

$$\text{Real Earnings Management (REM)} = \sum \text{CFO}_{i,t} / \text{ASSET}_{i,t-1} + \text{PROD}_{i,t} / \text{ASSET}_{i,t-1} + \text{DISC Expense}_{i,t} / \text{ASSET}_{i,t-1} \quad (7)$$

3.4. Research model

$$\mathbf{EM}_{i,t} = \beta_0 + \beta_1 \text{FMLD}_{i,t} + \beta_2 \text{CEOG}_{i,t} + \beta_3 \text{OTHER}_{i,t} + \beta_4 \text{LD}_{i,t} + \beta_5 \text{PMP}_{i,t} + \beta_6 \text{LEV}_{i,t} + \beta_7 \text{ROA}_{i,t} + \beta_8 \text{MBR}_{i,t} + \beta_9 \text{EXTF}_{i,t} + \beta_{10} \text{TQ}_{i,t} + \beta_{11} \text{DSTR}_{i,t} + \beta_{12} \text{SIZE}_{i,t} + \beta_{13} \text{AOC}_{i,t} + \beta_{14} \text{MNGO}_{i,t} + \beta_{15} \text{LTAC}_{i,t} + \boldsymbol{\varepsilon}_{i,t} \quad (8)$$

EM stands for both accrual and real activity-based earnings management. Our variables of interest are corporate governance mechanisms, such as, Female director (FMLD), CEO gender (CEOG). However, based on the evidence of empirical estimation, I will finalize our decisions on hypothesis, for instance, if any variable shows a statistically positive or negative relationship, and then I will conclude that independent variables are positively or negatively associated with earnings management.

Practically a company may use various earnings management techniques as a proxy (Zang, 2012), or may use a mix of "accrual and real-activity-based earnings management", or choose one method over the others for expected earnings (Laksmana & Yang, 2014). Similarly, Fields, Lys, and Vincent (2001) stated that only a single earnings management system will not correspond to the overall effects of earnings management activities, however, to address this issue I add a variable naming OHER in our model. By using variable OTHER, I mean that according to Laksmana and Yang (2014) if the "dependent variable is any one of the accrual-based earnings management" I will use REM as a proxy explanatory variable for overall real-activity based earnings management, whereas if the dependent variable is anyone of the measure of Real-activity based earnings management (REM) I use the absolute value of discretionary accruals (ABS_DA) as the independent variable for accrual earnings management.

The study also includes some independent variables as control variables, because previous studies stated these factors might affect the relationship between corporate governance mechanism and earnings management. For example, a huge number of studies used firm size as a control variable, due

to diversified results (Sellami & Slimi, 2016). However, the larger firm experienced some extra power to choose accounting techniques and operating systems (Bouaziz, Salhi, & Jarboui, 2020). Consistently, Barton and Simko (2002) demonstrated that there is a positive relationship between the size of the firms and earnings management.

In contrast, a range of studies depicted that large firms usually have up-to-date internal control systems, as a result, less likely to incur earnings management (Kim, Chung, & Firth, 2003; Chandra & Wimelda, 2018; Zouari, Lakhal, & Nekhili, 2015). Moreover, I also use some other factors as previous studies found ambiguous results regarding these variables, such as firm financial leverage (Chandra & Wimelda, 2018; Kordestani & Mohammadi, 2016; Lemma, Negash, Mlilo, & Lulseged, 2018), return on assets (Lopes, 2018; Laksmana & Yang, 2014); market to book ratio (El Guindy & Basuony, 2018); average operating cycle (Kordestani & Mohammadi, 2016); product market power (Datta, Iskandar-Datta, & Singh, 2013); loss dummy and External financing (Zhang, Uchida, & Dong, 2020); debt maturity structure (Lemma, Negash, Mlilo, & Lulseged, 2018); managerial ownership (Sumantri, Kusnawan, & Anggraeni, 2021; Al-Fayoumi, Abuzayed, & Alexander, 2010); lagged total accruals (Muttakin, Khan, & Azim, 2015; Koh, 2003); Tobin's Q (Muttakin, Khan, & Mihret, 2017). I present the variable definition in Table 2, and sketch the data and disclose descriptive statistics in the subsequent part.

4. Results and discussion

4.1. Descriptive statistics and univariate results

Table 2: Descriptive statistics

VAR	MEAN	SD	MIN	25%	MEDIAN	75%	MAX
ABS_DA	0.441	0.615	-3.424	-1.183	-0.787	-0.455	1.342
REM	0.474	0.626	-3.307	-1.088	-0.703	-0.408	1.343
FMLD	1.175	1.141	0.000	0.000	1.000	2.000	5.000
CEOG	0.062	0.242	0.000	0.000	0.000	0.000	1.000
MNGO	0.378	0.232	0.000	0.210	0.391	0.536	1.000
LD	0.053	0.224	0.000	0.000	0.000	0.000	1.000
PMP	0.156	0.181	-1.619	0.084	0.141	0.225	0.917
LEV	0.114	0.141	0.000	0.024	0.069	0.159	2.183
ROA	0.076	0.729	-2.969	0.017	0.041	0.077	23.542
MBR	0.380	0.282	-4.110	0.180	0.356	0.564	0.985
EXTF	-1.445	24.766	-616.168	-0.057	0.369	0.765	3.691
TQ	0.516	0.387	-3.571	0.339	0.498	0.689	9.865
DSTR	0.364	0.218	0.003	0.202	0.330	0.489	1.599
SIZE	7.484	1.418	3.147	6.568	7.418	8.341	11.865
AOC	-59.199	553.796	-10703.04	1.700	2.154	2.408	5.169
LTAC	-329.734	347.563	-1197.360	-595.668	-215.710	2.034	7.110

Table 2 demonstrates the descriptive statistics of all the variables used in the regression model. However, the mean values of discretionary accruals and Real-earnings management are 0.44 and 0.47 respectively. This is consistent with the cross-country research of (Lemma, Negash, Mlilo, & Lulseged, 2018), for example, based on 41 countries from the period of 1995-2016 (Lemma, Negash, Mlilo, & Lulseged, 2018) pointed out that average discretionary accruals and real-earnings management for these countries are around 0.45 to 0.50. But our results are not consistent with some other studies due to time difference and sample size (e.g., Klein, 2002) in the US study; (Abed, Al-Attar, & Suwaidan, 2012) study on Jordanian firms; (Ahmad, Khan, Abdullah, & Rashid, 2017; Muttakin, Khan, & Azim, 2015) study on Bangladesh. Average female director in the board is 1.18, it means on an average 14.59% female director are there in the Board of sample non-financial organizations of Bangladesh. This result is consistent with (Harakeh, El-Gammal, & Matar, 2019). Table 3 also illustrates that 6% of CEOs are female, in the listed non-financial organizations of Bangladesh.

Table 3 shows the correlations among all the variables including dependent, independent, and control variables. Overall, results show no multicollinearity among the variables. However, multi-colinearity problem may arise due to a high degree of association between the variables, specifically, if the correlation coefficients hold more than ± 0.8 (Almasarwah, 2015; Alghamidi, 2012; Habbash, 2010; Haniffa, Rahman, & Ali, 2006). Both accrual and real earnings management positively and significantly correlated at a 5% level of significance, meaning that the managers of listed non-financial organizations of Bangladesh are using both earning management to enjoy their expected benefits.

The table also illustrates a significant relationship of CEO gender with accrual earnings management, as well as significant relationship of the CEO gender with real-earnings management. I further evaluate the relationship by using regression analysis as the univariate test provides limited insight in this association. After heteroscedasticity (white test) and variance inflation factor (VIF) test I found there is no severe heteroscedasticity and multicollinearity problem.

Table 3: Univariate analysis

Var.	ABS-DA	REM	FMLD	CEOG	MNGO	PMP	LD	LEV	ROA	MBR	TQ	DSTR	SIZE	LTAC	AOC	EXTF
ABS-DA	1															
REM	0.49***	1														
FMLD	0.00	-0.02	1													
CEOG	0.10***	0.07**	0.20***	1												
MNGO	-0.02	-0.02	0.18***	-0.07**	1											
PMP	-0.03	-0.16***	0.03	0.02	-0.11***	1										
LD	0.04	0.05	-0.07**	0.03	-0.05	-0.22***	1									
LEV	0.01	-0.10***	-0.16***	-0.09***	0.04	0.01	0.10***	1								
ROA	-0.02	0.01	0.00	0.00	-0.02	0.02	-0.05*	-0.02	1							
MBR	0.10***	0.08**	-0.02	0.06*	-0.11***	0.03	0.03	-0.07**	-0.03	1						
TQ	0.07**	-0.01	-0.06**	-0.01	-0.04	-0.01	0.04	0.20***	-0.03	0.35***	1					
DSTR	0.06**	0.21***	-0.01	0.02	0.21***	-0.26***	0.05*	-0.1***	0.01	-0.08**	-0.01	1				
SIZE	-0.45***	-0.21***	-0.04	-0.14***	0.02	0.07**	-0.14***	0.09***	0.01	-0.30***	-0.16***	0.03	1			
LTAC	-0.26***	-0.18***	-0.01	-0.04	0.00	0.07**	-0.02	-0.02	-0.05	-0.12***	-0.08**	0.05	0.49***	1		
AOC	0.01	0.02	0.02	0.03	0.07**	-0.05*	0.02	-0.04	0.00	-0.03	-0.03	0.06*	0	-0.01	1	
EXTF	-0.05	-0.04	0.01	0.01	0.03	0.03	-0.04	0.01	0.00	0.00	0.01	-0.01	0.03	0.02	-0.01	1

Table shows the univariate results of all the variables. The definitions of variables are given in table 2. Statistical significance level are marked by star *,**,*** for 10% ,5% ,and 1% level respectively.

4.2. Regression results of gender-diversity and earnings management

Table 4 demonstrates the regression results of overall accrual and Real earnings management (dependent variable) as a function of overall accrual and Real earnings management, the independent variables are Gender-diversity (FMLD, CEOG) along with some other control variables. It is experienced that, mostly overall accrual and real earning management positively and significantly associated with each other. Which means that non-financial organizations of Bangladesh using both forms of earnings management simultaneously to manipulate economic performance, this result is consistent with Velte (2019), but inconsistent with others (Laksmana & Yang, 2014; Lemma, Negash, Mlilo, & Lulseged, 2018). Evidence shows that female director in the board has no significant association with any proxies of accrual earnings management. In Panel F of Table 4 the coefficient of FMLD is significantly (at 10% level) positively associated with abnormal discretionary expenses, which indicates that, to supplement financial benefits and professional status female directors may dictate CEO to manipulate earnings by compromising quality and by decreasing research & development, selling and administrative expenses in the profits and loss statement. Table 4 also demonstrates that gender diversity of CEO is negatively connected with abnormal production cost (R_PROD) and positively associated with abnormal cash flow from operating activities (R_CFO), and the relationship is statistically significant at 10% level and 5% level respectively, consistent with the notion of Schubert (2006) female CEO more likely to depends on conservative approaches of accounting, as a result they tends to reduce unusual administrative and other production expenses to maintain steady earnings, on the other hand, due to the capability of situational decision making female CEO is more likely to supplement cash flow by offering discount, after sales service and improving inventory, which in turns maintain linear earnings.

This study used a range of control variables, all variables have a relationship with accrual earnings management, but some of the variables have a significant relationship, for example, managerial ownership (MNGO), product market power (PMP), leverage (LEV), return on asset (ROA), market to book ratio (MBR), loss dummy (LD), debt maturity structure (DSTR), and lagged total accruals (LTAC). Moreover, Size is only statistically significant with all the proxies of dependent variables. Furthermore, External financing (EXTF), Tobin's Q, and Average operating cycle (AOC) has no significant relationship with any proxies.

Table 4: Gender-diversity and earnings management

Variables	**Gender-diversity and Earnings Management**			Variables	**Gender-diversity and Earnings Management**		
	Accrual-earnings management				Real-earnings management		
	Panel A	Panel B	Panel C		Panel D	Panel E	Panel F
	ABS_DA	POS_DA	NEG_DA		R_PROD	R_CFO	R_DISC
REM	0.410***(15.85)	0.233***(7.68)	-0.208***(-5.25)	ABS_DA	0.254***(8.10)	0.510***(18.28)	0.165***(5.18)
FMLD	-0.003(-0.25)	-0.003(-0.20)	0.018(0.84)	FMLD	-0.004(-0.25)	-0.012(-0.82)	0.027*(1.68)
CEOG	0.082(1.27)	-0.065(-0.86)	0.107(1.08)	CEOG	-0.113*(-1.55)	0.179**(2.76)	-0.090(-1.22)
MNGO	-0.037(-0.53)	-0.063(-0.77)	0.315***(2.96)	MNGO	-0.094(-1.20)	-0.147**(-2.11)	0.121(1.53)
LD	-0.075(-1.05)	-0.125(-1.51)	0.137(1.26)	LD	-0.174**(-2.19)	0.068(0.95)	-0.098(-1.21)
PMP	0.207**(2.30)	0.237**(2.25)	-0.260*(-1.89)	PMP	-0.190*(-1.89)	-0.077(-0.87)	-0.334***(-3.28)
LEV	0.367***(3.19)	0.241*(1.79)	-0.247(-1.40)	LEV	-0.384***(-2.97)	-0.278**(-2.42)	-0.28**(-2.18)
ROA	-0.022(-1.08)	-0.045*(-1.83)	0.008(0.24)	ROA	0.014(0.61)	0.010(0.49)	-0.055**(-2.31)
MBR	-0.123**(-2.05)	-0.064(-0.91)	0.358***(3.88)	MBR	-0.023(-0.34)	0.129**(2.14)	0.011(0.17)
EXTF	-0.001(-0.89)	0.000(-0.37)	0.001(1.06)	EXTF	0.001(1.11)	0.000(0.07)	-0.001(-0.92)
TQ	0.035(0.81)	0.037(0.74)	0.079(1.20)	TQ	-0.014(-0.28)	-0.005(-0.12)	-0.022(-0.45)
DSTR	0.002(0.03)	-0.155*(-1.75)	0.046(0.39)	DSTR	0.447***(5.35)	0.290***(3.89)	0.320***(3.78)
SIZE	-0.165***(-12.53)	-0.062***(-3.98)	0.108***(5.34)	SIZE	0.128***(8.09)	0.024*(1.70)	0.149***(9.24)
AOC	0.000(-0.01)	0.000(0.34)	0.000(-0.11)	AOC	0.000(0.71)	0.000(-0.59)	0.000(-1.10)
LTAC	0.000(0.29)	0.000(-0.10)	0.000(1.60)	LTAC	0.000**(-2.27)	0.000(-1.48)	0.000***(-2.93)
Constant	0.635***(4.72)	0.304**(1.93)	-1.368***(-6.62)	Constant	-1.973***(-13.07)	-0.667***(-4.96)	-2.806***(-18.34)
Year effect	yes	yes	yes	Year effect	yes	yes	yes
Adj.R2	0.369	0.079	0.086	Adj.R2	0.142	0.321	0.122
Prob.	0.000	0.000	0.000	Prob.	0.000	0.000	0.000
N	1062	1062	1062	N	1062	1062	1062

Note: Table shows the regression results of Gender-diversity and Earnings management. Statistical significance level are marked by star *, **, *** for 10%, 5%, and 1% level respectively. ABS_DA is Discretionary Accruals (Modifies Jones Model), POS_DA is Positive discretionary accruals, NEG_DA is Negative discretionary accruals, R_PROD is abnormal discretionary accruals, R_CFO is abnormal cash flow from operating activities, R_DISC is abnormal discretionary accruals , FMLD is Female director, CEOG is CEO gender ,MNGO is Managerial shareholder, LD is Loss Dummy, PMP is product market power, LEV is Leverage, ROA is Return on Asset, MBR is Market to Book ratio, EXTF is External Financing, TQ is Tobin's Q, DSTR is Debt maturity structure , SIZE is size, AOC is Average operating Cycle, LTAC is Lagged total accruals.

5. Test of multicollinearity

Multicollinearity might be an issue in regression model since I won't be able to discern between the independent variables' individual impacts on the dependent variable. VIF starts at 1 and has no maximum limit, according to conventional norms. However, VIF more than 5 or 10 indicates a lot of multicollinearities between one independent variable and the others (Snee, 1981). Our results, displayed in Table 10, reveal that no variables have a VIF greater than 5, indicating that there is no multicollinearity concern.

Table 5: Multicollinearity test

Variable	VIF	Tolerance	Variable	VIF	Tolerance
Accrual earnings Management			Real Earnings Management		
SIZE	2.76	0.36	SIZE	2.89	0.35
LTAC	1.38	0.72	LTAC	1.37	0.73
MBR	1.36	0.74	MBR	1.36	0.73
FMLD	1.32	0.76	ACMT	1.33	0.75
LEV	1.26	0.79	FMLD	1.32	0.76
TQ	1.26	0.80	LEV	1.26	0.79
DSTR	1.25	0.80	TQ	1.25	0.80
MNGO	1.21	0.82	DSTR	1.21	0.83
REM	1.2	0.83	MNGO	1.21	0.83
PMP	1.19	0.84	ACM	1.19	0.84
CEOX	1.14	0.88	CEOX	1.14	0.88
LD	1.12	0.90	LD	1.12	0.89
AOC	1.03	0.97	EXTF	1.03	0.97
EXTF	1.03	0.97	AOC	1.03	0.97
ROA	1.01	0.99	ROA	1.01	0.99
Mean VIF	1.35		Mean VIF	1.36	

5.1. Test of heteroscedasticity

The homoscedasticity of our observations is checked using the Breusch and Pagan (1979) test. Homoscedasticity, also known as homogeneity of variances, is the concept that variations in various groups are equal or comparable. The basic indicator of the Breusch and Pagan (1979) test is that if the test statistic has a p-value less than a certain threshold (e.g., 0.05), the null hypothesis of homoskedasticity is rejected and heteroskedasticity is accepted (Breusch & Pagan, 1979). Our findings in Table 9 reveal that p-value greater than 0.05 (P>0.05), indicating homoscedasticity of variance.

Table 6: Heteroscedasticity results for both accrual and real earnings management

White test for Heteroscedasticity		
	Accrual Earnings management Model (Modified Jones Model)	Real-Earnings Management
Chi ^{2}(1	303.22	333.56
Prob. > chi ^{2}	0.343	0.056

6. Conclusion

The paper examines empirically the association between gender-diversity and earnings management from the perspective of Bangladeshi non-financial organizations. The empirical evidence depicts that Bangladeshi non-financial organizations are using both earnings management at once. Further evidence also shows that female director in the board has no significant association with any proxies of accrual earnings management, but significantly (at 5% level) positively associated with abnormal discretionary expenses. Moreover, gender diversity of CEO is negatively connected with abnormal production cost (R_PROD) and positively associated with abnormal cash flow from operating activities (R_CFO), and the relationship is statistically significant at 10% level and 5% level respectively.

The findings of this study pave the way for policymakers to reform reporting practices and corporate governance policies especially for women involvement with corporate level. However, some limitations are associated with this paper, it does not mean the failure of the research, such as; due to the lack of information the sample size is reduced, because of complexity in data collection, political and cultural factors of earnings management are not addressed. Therefore, further research on other economic settings and more testable variables might give some diversified results in this connection.

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Appendix

Table 1: Variable definitions

Variable	Description
Accrual-Based Earnings Management	
ABS_DA	The absolute value of discretionary accruals measured by Modified Jones Model
Real-Earnings Management	
R_CFO	Abnormal cash flow from operations
R_PROD	Abnormal production costs
R_DISC	Abnormal discretionary expenses
REM	I measure Real earnings management by Combining of R_CFO, R_PROD, and R_DISC.
Independent Variable	
FMLD (Female director)	Number of Female director in the board at the end of each year
CEOG (CEO Gender)	I measure CEO gender as a dummy variable which takes 1 if the CEO is a female and zero otherwise.
MNGO (Managerial Ownership)	The percentage of shares holds by directors of the board.
LD (Loss Dummy)	If companies incur loss in a year I denoted it by 1 and 0 otherwise.
PMP (Product Market Power)	(Sales-Cost of goods sold- selling and administrative expenses)/ Sales
LEV(Leverage)	The ratio of total shareholders' equity to total assets.
ROA (Return on Asset)	I measure ROA by using the formula, such as, Net income / Total asset
MBR (Market to Book Ratio)	Market value divided by the book value of shareholders equity.
EXTF (External financing)	Total long-term interest-bearing debt, current long-term debt, other short-term debt, and capital from common stocks divided by retained earnings.
TQ (Tobin's Q)	Tobin's q is the market value of equity plus the book value of total debt divided by the book value of asset.
DSTR (Debt maturity structure)	Total current liabilities to total liabilities.
SIZE (Firm Size)	Firm Size is calculated by taking the natural log of total sales.
AOC (Average Operating Cycle)	I use the following formula $\frac{\text{Average account receivable}}{\text{Sales}/360} + \frac{\text{Average Inventory}}{\text{Cost of Good sold } 360}$)- $\frac{\text{Average account Payable}}{\text{Purchase } 360}$
LTAC (Lagged total Accruals)	Lagged total accruals.