

CEO Compensation and Earnings Management-The Moderating Role of COVID-19 Pandemic: Evidence from Bangladesh

Md Helal Uddin*

Department of Business Administration, Faculty of Business Studies, International Islamic University
Chittagong, Bangladesh

*Corresponding Author

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ABSTRACT

This study examines the impact of CEO compensation on earnings management and the moderating role of COVID-19 pandemic on this connection using accrual and real earnings management techniques in an emerging economy context. The annual reports of non-financial enterprises in Bangladesh from 2011 to 2021 have been analyzed in order to compile the data being collected. The methodologies of accrual and real earnings management are utilized in the beginning stages of the study in order to measure earnings management. Following this, the research employs the ordinary least square model in order to determine the findings of the regression. According to the findings of the study, there is a negative correlation between the compensation of CEOs and both accrual and actual earnings management. In addition, during the COVID-19 pandemic phase, businesses had a tendency to participate in real earnings management less frequently than they did before the pandemic outbreak. It is interesting to note that the data underline the fact that CEO compensation and the COVID-19 epidemic combined have a favorable impact on real-earnings management. The findings of the study make a contribution to the existing body of literature on corporate governance by offering insights into the influence that CEO compensation has on earnings management. It is anticipated that the findings of the study will be helpful for corporate policymakers in the process of formulating policies that are suited for lowering the earning management strategies that are utilized in businesses.

Keywords: CEO compensation, Covid-19 pandemic, Earnings Management, Non-Financial Organization, Bangladesh

JEL classification: M10; M12; M14; M41; M48

INTRODUCTION

The relationship between CEO compensation and earnings management is complex and can vary depending on the specific context and circumstances of a company. 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 benefit (Bergstresser & Philippon, 2006) and to generate some expected affluence of the organization (Degeorge et al., 1999). Many factors may trigger the motives of managers to involve with earnings management. Prior research on the Bangladeshi economy has primarily examined various factors that influence earnings management. These factors include business group affiliation (Muttakin et al., 2017), CSR disclosures (Muttakin et al., 2015), enterprise resource planning systems (Sarkar, 2018), highly fluctuating revenue and operating profit (Ahmed & Azim, 2015), and firm-specific determinants (Habib, 2005). Existing earnings management studies also investigate many incentives for earnings management, such as; market expectation and evaluation, contractual incentives, political incentives and companies' specific situations

(Callao et al., 2021). CEO compensation patterns reveal wide variation in international data settings among the various factors potentially associated with earnings management. Previous studies indicate that a rise in CEO equity incentives does not automatically lead to an increase in earnings management. This is because directors adapt their level of supervision in response to changes in CEO incentives (Laux & Laux, 2009). Furthermore, the study indicates that CEO incentive remuneration rises in correlation with earnings management, perhaps leading managers to engage in earnings management to boost their compensation (Assenso-Okofu et al., 2021). Existing research on the connection between CEO compensation and earnings management mostly concentrated on developed economy (e.g., Laux & Laux, 2009; Harris et al., 2019; Almadi & Lazic, 2016). A few studies demonstrate the relationship between CEO characteristics and earnings management (e.g., Uddin, 2023; Arif et al., 2023). Existing research from the perspective of Bangladesh focuses on CEO gender, duality, nationality and political connection. No study addresses the impact of CEO compensation on earnings management from the perspective of Bangladesh. On the other hand, the current body of research fails to adequately address the consequences of adverse economic conditions and health crises. Prior studies (e.g., Ahmad Zaluki et al., 2011; Tahinakis, 2014) have indicated that during periods of economic downturn, many stakeholders tend to scrutinise enterprises more extensively. This phenomenon results in an increased prevalence of cautious performance and fraudulent behaviour (Ahmad Zaluki et al., 2011; Tahinakis, 2014). The COVID-19 pandemic represents a significant element. There is a notable absence of research that examines the impact of the COVID-19 epidemic on the association between CEO compensation and earnings management. The COVID-19 pandemic has resulted in significant transformations in the socioeconomic context of several countries, resulting in global financial upheavals and pressures (Kuckertz et al., 2020). According to Howell et al. (2020), the financial market for entrepreneurs is anticipated to experience substantial and enduring repercussions as a result of the adverse effects of COVID-19 on enterprises. Demircuc-Kunt et al. (2021) assert that various types of firms experience adverse effects as a consequence of shocks arising from such occurrences. The influence of CEO compensation on financial reporting quality in the context of the COVID-19 pandemic remains uncertain. Therefore, it is hypothesized that the COVID-19 epidemic could have a substantial impact on the correlation between CEO compensation and the practice of earnings management. Hence, the objectives of this study encompass two aspects. Firstly, it aims to examine the connection between CEO compensation and earnings management. Secondly, it seeks to investigate the moderating influence of the COVID-19 epidemic on this relationship. In order to fulfil the stated aims, the study has taken into account both accrual and real earnings management techniques to measure earnings management. The analysis reveals a negative correlation between CEO compensation and both accrual and real earnings management. Furthermore, company's exhibit reduced involvement in manipulating actual earnings during the COVID-19 epidemic as comparison to the period before the pandemic. Notably, the research reveals that both CEO compensation and the covid-19 epidemic have a good impact on real-earnings management when considered together. The remainder of the paper is designed as follows: section 2 develops and explains hypotheses. Section 3 provides the research design including sample selection, variable measurement, and empirical model development. Section 4 demonstrates descriptive statistics, multivariate analysis, and main findings. Section 5 shows additional analysis and robustness checks. Finally, section 6 concludes the paper with discussions, limitations, and directions for future study.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

CEO compensation and earnings management

Unlike research demonstrated that CEO compensation is vital to involve managers with earnings management (Bergstresser & Philippon, 2006). Because, by offering various incentives, company owner's minimize the gap with managers (Carter et al., 2003) and maximize their returns (Watts & Zimmerman, 1978). As a result, managers enjoy the freedom of accounting choices and authoritative power to deal with any transaction. Yet, the association between compensation and earnings management will vary according

to managers' desire since they might get a bonus or stock option or any other inducements as compensation (Cheng & Warfield, 2005). For instance, managers may manipulate financial statements by using accounting techniques such as a change from FIFO to LIFO inventory method and accelerated to straight-line depreciation method to maximize bonus compensation (Harakeh et al., 2019), since these two changes have remarkable effects on reported earnings. For example, changing the depreciation method from accelerated to straight-line typically increases earnings, whereas LIFO's change decreases earnings (Khalil, 2010). Previous studies show that bonus compensation positively affects earnings management (e.g., Guidry et al., 1999). In contrast, CEO can get maximum benefits by selling bonus stocks, so that they use aggressive accounting techniques to increase the short-term share price; thus, company earnings suddenly blow up (Burns & Kedia, 2006).

Moreover, the managers may enjoy compensation by fulfilling the company target to be involved with income decreasing strategy and income increasing techniques. However, Healy (1985) pointed that if the fiscal year earnings are below or upper the targeted limit, then the manager manipulates it to fulfill the target, for example, if the earnings are above the limit, the managers save extra earnings for covering the following year to maximise compensation, for reversal case they use income-increasing techniques (Jensen, 2004). Alternatively, compensation might motivate managers to augment work efficiency and consciousness about the accuracy of financial statements. Because, according to signaling theory, company wants to disclose quality information and receive positive signals from the stakeholders (Bae et al., 2018). A recent study shows a negative relationship between CEO compensation and earnings management (Cella et al., 2017). Based on the above discussion, the study proposes following hypothesis:

H1: There is a significant negative relationship between CEO compensation and earnings management

Covid-19 pandemic and earnings management: The moderating role on CEO compensation and earnings management connection.

During moments of economic instability and financial downturns, a lot of research has been done on managing earnings (Ali et al., 2022). According to Smith et al. (2001), economic downturns impose pressure on firm performance, forcing management to use discretionary accounting policy alternatives more aggressively. However, as of today, the results are still inconclusive. For example, Ahmad-Zaluki et al. (2011) discover that during the East Asian crisis, Malaysian enterprises engage in earnings management by boosting profits. In the European context, Tahinakis (2014) found that European enterprises functioning in a recessive environment throughout the period 2005-2013 demonstrate supportive evidence of earnings manipulation through R&D reduction to avoid reporting earnings losses. Another body of research, on the other hand, suggests that during crises and recessions, enterprises are subjected to more scrutiny from many stakeholders, which raises the need for conservative profits and greater financial reporting quality (Francis et al., 2013). As a result, even in such a severe economic crisis, managers are less likely to engage in greater earnings management (Chintrakarn et al., 2018). Because investors are likely prepared to overlook a company's low profitability in these times, the market does not punish companies for bad performance (Türegün, 2020). Further data shows that earnings management for a sample of European listed Corporation in 16 countries declined dramatically during the 2008-2009 financial crises (Filip & Raffournier, 2014).

As a result, corporations are more likely to engage in earnings management tactics during the COVID-19 pandemic year. As a result, management may utilize accounting standards or estimations to minimize such drops or losses, resulting in greater earnings management in the pandemic year than before the epidemic. According to recent studies, Chinese enterprises in the most seriously impacted regions increased accrual-based earnings management (AEM), whereas actual activity-based earnings management (REM) decreased significantly (Xiao & Xi, 2021). On the other hand, management may use the pandemic year to take a large bath by participating in greater income-decreasing earnings management. According to a previous accounting study on economic crises, corporations may purposefully cut earnings during the crisis period to

exaggerate earnings following the crisis (Rusmin et al., 2013; Kjaerland et al., 2021). Findings reveal that discretionary accruals decreased significantly from 2019 to 2020, implying that enterprises in greater income-decreasing earnings management suffered a huge hit in reporting earnings during the pandemic year (Liu & Sun, 2022). Alternatively, because chief executive officer compensation is less affected by unanticipated macroeconomic factors, management may not have strong incentives to manage earnings during the pandemic crisis. As a result, they are less likely to be penalized for failing to meet earnings targets during the pandemic year (Oxelheim et al., 2008). According to recent studies, in the United States, there was no earnings management during the unusual, pandemic-driven recession of 2020 (Jordan et al., 2021). Furthermore, Ali et al. (2022) found that firms tend to engage in fewer earnings management during pandemics. Therefore, it is unclear whether firms would manage earnings differently in the pandemic year. We develop a null hypothesis as follows:

H2: There is a positive impact of the COVID-19 pandemic on the relationship between CEO compensation and earnings management.

RESEARCH METHOD

Sample selection and data collection

The sample of the study included 118 non-financial organizations listed to on the Dhaka Stock Exchange, Bangladesh (Listed firm, 2021). The study excluded the financial organizations from the study because of the distinctive nature of transactions and separate regulations. The financial data on the study's variables were collected from the annual reports over 11 years from 2011 to 2021. The study period began in 2011 because of the discrepancy of necessary data for all proxies of earning management. Initially, this study considered 2133 firm-year observations but excluded 837 observations because of missing information and unavailability of the annual reports. Finally, 118 firms under thirteen industries have been fixed for empirical analysis (see Table I for details). All information has been collected manually from the annual reports to make a reliable and accurate analysis.

| Name of the industry | Number of Firms-year observation |
|-------------------------|----------------------------------|
| Total Sample firms -118 | |
| Cement industry | 77 |
| Ceramics industry | 55 |
| Engineering industry | 176 |
| Textile industry | 352 |
| Food industry | 99 |
| Power industry | 132 |
| Pharmaceuticals | 220 |
| IT | 44 |
| Services & Real Estate | 44 |
| Telecommunication | 11 |
| Tannery | 22 |
| Miscellaneous | 44 |
| Paper and printing | 22 |
| Total | 1296 |

Measurements of the study

Earning management

The study used both accrual and real-activity based earnings management as a proxy for measuring earning management. The detailed of these variable measurements have been discussed below:

Accrual-based earnings management

In measuring the accrual-based earnings management, this study measured both the manipulation of discretionary and non-discretionary accruals. Discretionary accruals illustrate the specification of discretionary costs, such as an expected conveyance allowance for management is not incurred but recorded in the journal books. While non-discretionary accruals are defined as advance recording i.e., 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 et al., 2019). In accordance with Dechow et al. (1995), this study used the Modified Jones model (see equation 3) as a proxy for earnings management. However, equation 1 depicts the total accruals as follows:

$$TAC_{it} = NOPI_{it} - CFO_{it} \dots \dots \dots (1)$$

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

Non-discretionary accruals (NDAC) were measured with the model below (see equation 2):

$$\frac{TAC_{i,t}}{TA_{i,t-1}} = \beta_1 \left(\frac{1}{TA_{i,t-1}} \right) + \beta_2 \left(\frac{\Delta REV_{it} - \Delta REC_{it}}{TA_{i,t-1}} \right) + \beta_3 \left(\frac{PPE_{it-1}}{TA_{i,t-1}} \right) + \varepsilon_{it} \dots \dots \dots (2)$$

Where, TAC stands for total accruals equals' income before extraordinary items minus operating cash flows. 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 receivables. The gross estimation of property, plant and equipment (PPE) included controlling for customary devaluation costs. T.A. represents Total Asset, and $\varepsilon_{i,t}$ outlines arbitrary mistakes.

Discretionary accruals (DAC) (total accruals minus non-discretionary accruals) were measured using equation 3 (see below):

$$DAC_{it} = TAC_{it} - NDAC_{it} \dots \dots \dots (3)$$

Measurement of real-activity based earnings management

Previous studies used abnormal cash flows, production costs, and discretionary expenses as proxies for measuring real earnings management (e.g., Gunny, 2010; Laksmana & Yang, 2014; Lemma et al., 2018; Zang, 2012). Consistent with previous studies (e.g., Lemma et al., 2018; Laksmana & Yang, 2014; Roychowdhury, 2006) the study measured cash flow from operating activities, production cost, and discretionary cost according to Dechow et al. (1998) model.

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

equation 4) is as follows:

$$\frac{CFO_{it}}{ASSET_{it-1}} = \beta_1 \left(\frac{1}{ASSET_{it-1}} \right) + \beta_2 \left(\frac{SALES_{it}}{ASSET_{it-1}} \right) + \beta_3 \left(\frac{\Delta SALES_{it}}{ASSET_{it-1}} \right) + \varepsilon_{it} \dots \dots \dots (4)$$

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.

While the following model (see equation 5) was used to calculate production cost and regressed for each firm:

$$\frac{DISCexpenses_{it}}{ASSET_{it-1}} = \beta_1 \left(\frac{1}{ASSET_{it-1}} \right) + \beta_2 \left(\frac{SALES_{it-1}}{ASSET_{it-1}} \right) + \varepsilon_{it} \dots \dots \dots (5)$$

Where PROD, indicates the sum of the cost of merchandise sold and change in stocks. Abnormal production cost was 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, we measured discretionary expenses utilising the following model (see equation 6):

$$\frac{PROD_{it}}{ASSET_{it-1}} = \beta_1 \left(\frac{1}{ASSET_{it-1}} \right) + \beta_2 \left(\frac{SALES_{it}}{ASSET_{it-1}} \right) + \beta_3 \left(\frac{\Delta SALES_{it}}{ASSET_{it-1}} \right) + \beta_4 \left(\frac{\Delta SALES_{it-1}}{ASSET_{it-1}} \right) + \varepsilon_{it} \dots \dots \dots (6)$$

Where DISC, refers to research and development and selling and administrative expenses in the profits and loss statement and abnormal discretionary expenses was estimated by taking the differences between the predicted value of discretionary cost and the amount of other in-service items expenses.

In accordance with the three models (equation 4 to 6) stated above, we generated an overall measure of earnings management (see equation 7) for each firm.

$$Real\ Earnings\ Management\ (REM) = \sum \frac{CFO_{it}}{ASSET_{it-1}} + \frac{PROD_{it}}{ASSET_{it-1}} + \frac{DISCexpenses_{it}}{ASSET_{it-1}} \dots \dots \dots (7)$$

CEO compensation

CEO compensation is measured by summarizing base Salary, personal benefits, bonuses and other benefits relating to compensation according to (Bouaziz et al., 2020; Price et al., 2015).

Control variables

Assuming larger firms may have experienced of some extra power to choose accounting techniques and operating systems (Bouaziz et al., 2020) and usually have up-to-date internal control systems, as a result, less likely to incur earnings management (Chandra & Wimelda, 2018; Zouari et al., 2012), similarly to considerably a large number of studies (Sellami & Slimi, 2016), the study controlled firm size to improve the robustness of the models. In addition to that, based a review of literature we controlled firm financial leverage (Chandra & Wimelda, 2018; Kordestani & Mohammadi, 2016; Lemma et al., 2018); return on assets (Barua et al., 2010; Alzoubi, 2018; Lopes, 2018; Laksmana & Yang, 2014); market to book ratio (El Guindy & Basuony, 2018); average operating cycle (Kordestani & Mohammadi, 2016); product market power (Datta et al., 2013); loss dummy and external financing (Zhang et al., 2020); debt maturity structure (Lemma et al., 2018); lagged total accruals (Koh, 2003; Muttakin et al., 2015); Tobin’s Q (Muttakin et al., 2017). We

present the variable definition in Table II, and sketch the data and disclose descriptive statistics in the subsequent part.

Research model

Based on the models stated earlier, we developed and used the following model (equation 8) to examine the association between earnings management (both accrual and real-activity-based earnings management) and CEO characteristics and other control variables of the study.

$$\text{Earnings management}_{i,t} = \beta_0 + \beta_1 \text{COMP}_{i,t} + \beta_2 \text{LD}_{i,t} + \beta_3 \text{PMP}_{i,t} + \beta_4 \text{LEV}_{i,t} + \beta_5 \text{ROA}_{i,t} + \beta_6 \text{MBR}_{i,t} + \beta_7 \text{EXTF}_{i,t} + \beta_8 \text{TQ}_{i,t} + \beta_9 \text{DSTR}_{i,t} + \beta_{10} \text{SIZE}_{i,t} + \beta_{11} \text{AOC}_{i,t} + \beta_{12} \text{LTAC}_{i,t} + \varepsilon_{i,t} \dots (8)$$

$$\text{Earnings management}_{i,t} = \beta_0 + \beta_1 \text{COMP}_{i,t} + \beta_2 \text{PANDEMIC}_{i,t} + \beta_3 \text{COMP} \times \text{PANDEMIC}_{i,t} + \beta_4 \text{LD}_{i,t} + \beta_5 \text{PMP}_{i,t} + \beta_6 \text{LEV}_{i,t} + \beta_7 \text{ROA}_{i,t} + \beta_8 \text{MBR}_{i,t} + \beta_9 \text{EXTF}_{i,t} + \beta_{10} \text{TQ}_{i,t} + \beta_{11} \text{DSTR}_{i,t} + \beta_{12} \text{SIZE}_{i,t} + \beta_{13} \text{AOC}_{i,t} + \beta_{14} \text{LTAC}_{i,t} + \varepsilon_{i,t} \dots (9)$$

The model 8 and 9 demonstrates the independent variables of the study are CEO compensation (COMP) (see Table II for the description of the variables of the study). In model 9, the study included moderating variable (COMP×PANDEMIC) 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). However, only a single earnings management system may not correspond to the overall effects of earnings management activities (Fields et al., 2001). To address this issue we use both earnings management model (e.g., Laksmana & Yang, 2014).

| Table II: Description on the variables of the study | |
|---|---|
| Variable | Description |
| Accrual-Based Earnings Management: | |
| DACC | Discretionary accruals is 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 | We measured real earnings management by combining of R_CFO, R_PROD, and R_DISC. |
| Independent Variable: | |
| PANDEMIC | A dummy variable equal to 1 during the pandemic period, and zero otherwise |
| COMP(CEO Compensation) | We measured the compensation CEO by the total of the compensation of the CEO. |
| LD (Loss Dummy) | If companies incur loss in a year we 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) | We measured 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) | We used 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. |

RESULTS AND DISCUSSION

Descriptive statistics including correlation statistics

Table III demonstrates the descriptive statistics of the variables used in the regression models. However, the mean values of discretionary accruals and real-earnings management are 0.39 and 0.42 respectively. This is consistent with the mean values of discretionary accruals and real-earnings management (0.45 to 0.50 respectively) found in the cross-country research conducted by Lemma et al. (2018) based on 41 countries. Table 3 illustrates that maximum, minimum, and average compensation for CEOs of non-financial organizations of Bangladesh are 8.292, 0.715, and 3.267 respectively.

Table III: Descriptive statistics

| Entire sample (2011-2021) | | | | |
|---------------------------|----------|---------|----------|--------|
| Variables | Mean | SD | MIN | MAX |
| DACC | 0.391 | 0.681 | 0 | 1.976 |
| REM | 0.424 | 0.293 | 0 | 2.005 |
| COMP | 3.267 | 1.522 | 0.715 | 8.292 |
| LD | 0.06 | 0.237 | 0 | 1 |
| PMP | 0.145 | 0.176 | -1.619 | 0.917 |
| LEV | 0.108 | 0.133 | 0 | 2.183 |
| MBR | 0.355 | 0.271 | -4.11 | 0.985 |
| ROA | 0.067 | 0.66 | -2.969 | 23.542 |
| TQ | 0.48 | 0.38 | -3.571 | 9.865 |
| DSTR | 0.34 | 0.211 | 0.003 | 1.599 |
| SIZE | 7.049 | 1.662 | 2.185 | 11.865 |
| EXTF | -1.864 | 27.582 | -616.168 | 3.691 |
| AOC | -67.324 | 585.859 | -10703 | 5.169 |
| LTAC | -302.655 | 330.764 | -1197.36 | 7.11 |

Table IV shows the correlations between the dependent, independent, and control variables of the study. Results show no correlation coefficients are more than ± 0.8 , and thus indicate no multi-co linearity issue

exists among the variables (e.g., Almasarwah, 2015; Alghamidi, 2012; Habbash, 2010; Haniffa et al., 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 compensation with earnings management. We further evaluate the relationship using regression analysis as the univariate test provides limited insight into this association. After heteroscedasticity (white test) and variance inflation factor (VIF) test (see Table IX), we found no heteroscedasticity (see Table X) and multicollinearity problem.

Table IV: Correlation statistics (Entire sample: 2011-2021)

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----------|----------|----------|----------|----------|----------|---------|----------|-------|----------|
| 1.DACC | 1.00 | | | | | | | | |
| 2.REM | 0.48*** | 1.00 | | | | | | | |
| 3.COMP | -0.40*** | -0.25*** | 1.00 | | | | | | |
| 4.LD | 0.05 | 0.05** | -0.13*** | 1.00 | | | | | |
| 5.PMP | -0.03 | -0.16*** | 0.03 | -0.23*** | 1.00 | | | | |
| 6.LEV | 0.00 | -0.11*** | 0.09*** | 0.11*** | 0.02 | 1.00 | | | |
| 7.MBR | 0.06** | 0.04 | -0.29*** | 0.02 | 0.05* | -0.05* | 1.00 | | |
| 8.ROA | -0.02 | 0.01 | 0.02 | -0.05* | 0.02 | -0.02 | -0.02 | 1.00 | |
| 9.TQ | 0.03 | -0.05* | -0.13*** | 0.04 | 0.02 | 0.21*** | 0.41*** | -0.02 | 1.00 |
| 10.DSTR | 0.02 | 0.16*** | 0.14*** | 0.03 | -0.21*** | -0.06** | -0.03 | 0.02 | 0.04 |
| 11.SIZE | -0.43*** | -0.24*** | 0.73*** | -0.14*** | 0.14*** | 0.13*** | -0.12*** | 0.03 | 0.01 |
| 12.EXTF | -0.07*** | -0.06** | 0.03 | -0.02 | 0.03 | 0.02 | -0.01 | 0.00 | 0.00 |
| 13.AOC | 0.01 | 0.02 | -0.03 | 0.03 | -0.05* | -0.04 | -0.02 | 0.00 | -0.03 |
| 14.LTAC | -0.22*** | -0.15*** | 0.31*** | -0.01 | 0.04 | -0.03 | -0.15*** | 0.05* | -0.10*** |
| Var. | 10 | 11 | 12 | 13 | 14 | | | | |
| DSTR | 1.00 | | | | | | | | |
| SIZE | 0.17*** | 1.00 | | | | | | | |
| EXTF | -0.02 | 0.06*** | 1.00 | | | | | | |
| AOC | 0.06** | 0.01 | -0.01 | 1.00 | | | | | |
| LTAC | 0.00 | 0.29*** | 0.01 | -0.02 | 1.00 | | | | |

Regression analysis results

Table V demonstrates the regression results of accrual and real earnings management with CEO compensation along with the study’s control variables. Table V illustrates that CEO compensation significantly (at 1% level) negatively associated with both earning management. However, these results support our hypotheses and are consistent with the views of (Bae et al., 2018) and hold the outcomes of (Cella et al., 2017), who also found a negative association between CEO compensation and earnings management. But this result is the opposite of (Raman & Shahrur, 2008). As stated earlier, the study controlled a range of independent variables: firm size, financial leverage, return on assets, market to book ratio, average operating cycle, product market power, loss dummy and external financing, debt maturity structure, and lagged total accruals, and Tobin’s Q. As reported in Table V, we see some of the variables have a significant relationship with earnings management. Managerial ownership, Tobin’s Q, and product market power show a significant and negative association with real-earnings management but lagged total

accruals (LTAC) show a positive association. Market to book ratio, external financing, and firm size negatively associated with accrual earnings management. Leverage, and debt maturity structure shows a significant positive relationship with discretionary accruals. Return on asset (ROA) and loss dummy illustrates no relationship with earnings management.

Table-V: Regression results on CEO Compensation and Earnings Management

| Variable | CEO compensation Vs Earnings management | |
|--------------------------|---|--------------------------|
| | Accrual earnings management | Real-earnings management |
| COMP | -0.068***(-4.15) | -0.059***(-3.43) |
| LD | -0.075(-1.15) | -0.053(-0.78) |
| PMP | 0.040(0.44) | -0.317***(-3.32) |
| LEV | 0.286**(2.43) | -0.141(-1.15) |
| MBR | -0.118*(-1.85) | 0.070(1.06) |
| ROA | -0.017(-0.77) | 0.005(0.21) |
| TQ | -0.008(-0.18) | -0.115**(-2.55) |
| DSTR | 0.215*** (2.76) | 0.543*** (6.71) |
| SIZE | -0.124***(-6.67) | 0.015(0.79) |
| EXTF | -0.001**(-2.49) | -0.001**(-2.17) |
| AOC | -0.000(-0.06) | -0.000(-0.58) |
| LTAC | -0.000(-1.05) | -0.000***(-3.39) |
| CONSTANT | -0.037(-0.21) | -0.651***(-3.52) |
| Year-dummy | yes | yes |
| Industry-dummy | yes | yes |
| Adjusted. R ² | 0.255 | 0.213 |
| Prob. | 0 | 0 |
| N | 1296 | 1296 |

Note: Table shows the regression results of CEO compensation and earnings management. Statistical significance level are marked by star *, **, *** for 10%, 5%, and 1% level respectively. The numbers in parentheses are t statistics.

Table-V1: Regression results on CEO Compensation and Earnings Management (Pre-Pandemic and Pandemic period)

| Variable | CEO Compensation and Earnings Management | CEO Compensation and Earnings Management | | |
|----------|--|--|-----------------------------|--------------------------|
| | | | | |
| | Pre-Pandemic period | Pandemic period | | |
| | Accrual-earnings management | Real-earnings management | Accrual-earnings management | Real-earnings management |
| COMP | -0.066***(-3.65) | -0.060***(-3.22) | -0.128***(-2.95) | -0.024(-0.54) |
| LD | -0.092(-1.16) | -0.070(-0.84) | 0.041(0.39) | 0.067(0.63) |
| PMP | -0.012(-0.11) | -0.378***(-3.49) | 0.047(0.22) | -0.037(-0.16) |
| LEV | 0.299**(2.35) | -0.113(-0.85) | 0.442(1.15) | -0.179(-0.45) |
| MB | -0.100(-1.46) | 0.069(0.96) | 0.87608 | -0.101(-0.40) |

| | | | | |
|--------------------------|------------------|------------------|------------------|-----------------|
| ROA | -0.018(-0.77) | 0.004(0.18) | 2.432***(2.93) | 2.091**(2.46) |
| TQ | -0.007(-0.15) | -0.113**(-2.27) | 0.042(0.30) | -0.113(-0.79) |
| DSTR | 0.225*** (2.65) | 0.548*** (6.19) | 0.141(0.64) | 0.342(1.50) |
| SIZE | -0.131***(-6.45) | 0.010(0.49) | -0.055(-1.46) | -0.037(-0.96) |
| EXTF | -0.001(-1.57) | -0.001(-1.25) | -0.003***(-3.30) | -0.002**(-2.46) |
| AOC | -0.000(-0.20) | -0.000(-0.52) | 0.000(0.13) | -0.000(-0.06) |
| LTAC | -0.000(-0.88) | -0.000***(-2.81) | 0.000(0.12) | -0.000(-0.66) |
| CONSTANT | 0.027(0.12) | -1.017***(-4.22) | 0.206(0.83) | -0.051(-0.20) |
| Year-dummy | yes | yes | yes | yes |
| Industry-dummy | yes | yes | yes | yes |
| Adjusted. R ² | 0.2479 | 0.2047 | 0.2408 | 0.1289 |
| Prob. | 0 | 0 | 0 | 0 |
| N | 1061 | 1061 | 235 | 235 |

Note: Table shows the regression results of CEO compensation and earnings management. Statistical significance levels are marked by star *, **, *** for 10%, 5%, and 1% level respectively. The numbers in parentheses are t statistics.

Table VI illustrates the association between CEO compensation and earnings management in the pandemic and pre-pandemic periods. CEO compensation has a significant negative association with accrual-earnings management in both periods but does not affect real-earnings management in pandemic period.

Table VII: Interaction affects

| VARIABLE | CEO compensation and earnings management | |
|----------------|--|--------------------------|
| | Accrual-earnings management | Real-earnings management |
| PANDEMIC | -0.252(-0.480) | -0.002(0.000) |
| COMP | -0.070***(-4.230) | -0.063***(-3.630) |
| COMP×PANDEMIC | 0.037(1.070) | 0.060*(1.690) |
| LD | -0.073(-1.110) | -0.049(-0.720) |
| PMP | 0.047(0.510) | -0.309***(-3.220) |
| LEV | 0.288** (2.450) | -0.141(-1.150) |
| MB | -0.117*(-1.820) | 0.070(1.060) |
| ROA | -0.017(-0.760) | 0.005(0.220) |
| TQ | -0.009(-0.210) | -0.118***(-2.620) |
| DSTR | 0.217*** (2.780) | 0.543*** (6.700) |
| SIZE | -0.125***(-6.700) | 0.014(0.720) |
| EXTF | -0.001**(-2.540) | -0.001**(-2.040) |
| AOC | 0.000(-0.060) | 0.000(-0.580) |
| LTAC | 0.000(-1.050) | 0.000***(-3.370) |
| CONSTANT | 0.150(0.270) | -0.978*(-1.700) |
| Year-dummy | YES | YES |
| Industry-dummy | YES | YES |

| | | |
|--------------------------|-------|-------|
| Adjusted. R ² | 0.254 | 0.213 |
| Prob. | 0 | 0 |
| N | 1296 | 1296 |

Note: Table shows the regression results of CEO characteristics and Earnings management. Statistical significance level are marked by star *, **, *** for 10%, 5%, and 1% level respectively. The numbers in parentheses are t statistics.

We also test a pandemic’s effect on earning management by adding interaction terms of COMP×PANDEMIC to the regression analysis. As shown in Table VII, the covid-19 pandemic has no significant effect on earnings management. Still, the coefficient on the interaction term (COMP×PANDEMIC) is positive and significant at the 10% level, which indicates that CEO compensation and the Covid-19 pandemic jointly affect real-earnings management.

ADDITIONAL ANALYSIS AND ROBUSTNESS CHECK

We conduct robustness checks on the link between CEO compensation and earnings management. Therefore, the study examines whether main results hold when we use alternative measures of earnings management. We show our results in Tables VIII using a pre-pandemic and during the pandemic sample. Our study uses three alternative models of measuring accrual earning management, namely, the Jones model (Jones, 1991), Kothari model (Kothari et al., 2005), Caylor model (Caylor, 2010). Results demonstrate that our findings are qualitatively the same as our main results. We also use individual proxies of real-earnings management, such as; abnormal production cost, abnormal cash flow from operating activities, and abnormal discretionary accruals (Dechow et al., 1998). Our additional findings are also robust with the main result of CEO compensation and real-earnings management.

Table VIII: Robustness check using alternative models of accrual and real-earnings management

| Variable | CEO compensation and Earnings management (Pre-pandemic period) | | | | | |
|-------------|--|-------------------------|------------------------|--------------------------|--|---------------------------------|
| | Accrual-earnings management | | | Real-earnings management | | |
| | Jones Model | Kothari Model | Caylor-2010 model | Abnormal production cost | Abnormal cash flow from operating activities | Abnormal discretionary accruals |
| COMP | -0.063***(-3.54) | -0.064***(-3.59) | -0.051**(-2.28) | -0.021(-1.13) | -0.050***(-2.79) | 0.005(0.28) |
| LD | -0.095(-1.25) | -0.087(-1.11) | -0.019(-0.19) | -0.200**(-2.43) | -0.047(-0.59) | -0.098(-1.25) |
| PMP | -0.009(-0.09) | -0.006(-0.06) | 0.010((0.08) | -0.211**(-1.97) | 0.006(0.06) | -0.318***(-3.11) |
| LEV | 0.314**(2.49) | 0.296**(2.35) | -0.248(-1.57) | -0.220*(-1.66) | -0.022(-0.17) | -0.101(-0.80) |
| MBR | -0.100(-1.47) | -0.100(-1.47) | 0.073(0.86) | -0.043(-0.60) | 0.083(1.21) | 0.043(0.63) |
| ROA | -0.017(-0.74) | 0.004(0.16) | 0.016(0.58) | 0.010(0.42) | -0.001(-0.06) | -0.056**(-2.50) |
| TQ | -0.008(-0.17) | -0.008(-0.17) | -0.027(-0.47) | -0.018(-0.38) | -0.020(-0.42) | -0.023(-0.49) |
| DSTR | 0.215**(2.56) | 0.225***((2.67) | 0.278***((2.65) | 0.464***((5.28) | 0.403***((4.76) | 0.359***((4.29) |
| SIZE | -0.130***(-6.46) | -0.132***(-6.54) | 0.054**(2.13) | 0.106***((5.02) | -0.024(-1.17) | 0.131***((6.53) |

| | | | | | | |
|--------------------------|---------------|---------------|------------------|------------------|------------------|-------------------|
| EXTF | -0.001(-1.56) | -0.001(-1.58) | 0.000(-0.46) | 0.000(0.29) | 0.000(-0.66) | -0.001(-1.30) |
| AOC | -0.000(-0.23) | -0.000(-0.14) | 0.000(0.36) | 0.000(0.37) | -0.000(-0.74) | -0.000*(-1.71) |
| LTAC | -0.000(-1.09) | -0.000(-0.91) | 0.000(1.08) | 0.000*(-1.66) | -0.000(-1.83) | -0.000*(-1.90) |
| CONSTANT | 0.029(0.13) | 0.030(0.13) | -1.844***(-6.47) | -1.705***(-7.13) | -1.395***(-6.06) | -3.019***(-13.28) |
| Year-dummy | yes | yes | yes | yes | yes | yes |
| Industry-dummy | yes | yes | yes | yes | yes | yes |
| Adjusted. R ² | 0.248 | 0.249 | 0.113 | 0.248 | 0.191 | 0.214 |
| Prob. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| N | 1061 | 1061 | 1061 | 1061 | 1061 | 1061 |

| CEO characteristics and Earnings management (Covid-19 pandemic period) | | | | | | |
|--|-----------------------------|-------------------------|-------------------------|--------------------------|--|---------------------------------|
| Variable | Accrual-earnings management | | | Real-earnings management | | |
| | Jones Model | Kothari Model | Caylor-2010 model | Abnormal production cost | Abnormal cash flow from operating activities | Abnormal discretionary accruals |
| COMP | -0.113***(-2.75) | -0.134***(-3.07) | -0.125***(-2.78) | -0.048(-1.13) | -0.039(-1.08) | -0.022(-0.56) |
| LD | 0.028(0.29) | 0.046(0.45) | 0.012(0.12) | 0.018(0.18) | 0.166*(1.92) | 0.063(0.69) |
| PMP | 0.062(0.31) | 0.048(0.22) | -0.145(-0.65) | -0.214(-1.02) | 0.175(0.96) | 0.029(0.15) |
| LEV | 0.548(1.53) | 0.470(1.23) | 0.333(0.85) | 0.197(0.53) | 0.475(1.48) | -0.670**(-1.97) |
| MBR | -0.350(-1.42) | -0.396(-1.50) | -0.271(-1.01) | -0.135(-0.53) | 0.189(0.86) | -0.630***(-2.70) |
| ROA | 2.511*** (3.26) | 2.460*** (2.99) | -1.243(-1.48) | 3.907*** (4.92) | 3.485*** (5.09) | 1.719** (2.36) |
| TQ | 0.008(0.06) | 0.021(0.15) | 0.050(0.34) | -0.133(-0.97) | -0.163(-1.38) | 0.249** (1.99) |
| DSTR | 0.121(0.57) | 0.172(0.76) | 0.598** (2.58) | 0.352(1.61) | 0.506*** (2.69) | 0.481** (2.40) |
| SIZE | -0.040(-0.86) | -0.034(-0.69) | 0.101** (1.99) | 0.064(1.34) | -0.007(-0.16) | 0.166*** (3.78) |
| EXTF | -0.002***(-2.96) | -0.003***(-3.24) | 0.000(0.14) | 0.000(0.13) | -0.002***(-3.16) | -0.002***(-2.96) |
| AOC | 0.000(0.02) | 0.000(0.18) | 0.000(0.67) | 0.000(0.33) | 0.000(-0.24) | 0.000(-1.36) |
| LTAC | 0.000(-0.40) | 0.000(-0.19) | 0.000(1.10) | 0.000(-0.05) | 0.000(-0.23) | 0.000**(-2.30) |
| CONSTANT | 0.042(0.14) | 0.065(0.20) | -1.754***(-5.30) | -1.708***(-5.47) | -0.541**(-2.01) | -2.171***(-7.57) |
| Year-dummy | yes | yes | yes | yes | yes | yes |
| Industry-dummy | yes | yes | yes | yes | yes | yes |
| Adjusted. R ² | 0.246 | 0.239 | 0.326 | 0.225 | 0.284 | 0.395 |
| Prob. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| N | 235 | 235 | 235 | 235 | 235 | 235 |

Test of Multicollinearity

Multicollinearity happens in a multivariate regression model when significant inter-correlations exist between two or more independent variables. When it comes to the effect of independent variables in a model, multicollinearity might result in larger confidence intervals, leading to less trustworthy probability. As a result, we employ the multicollinearity VIF test. The variance inflation factor (VIF) is a metric for determining how much multicollinearity there is in a collection of multivariate regression variables. The VIF for a regression model variable is equal to the ratio of the total model variance to the variance of a model that includes that single independent variable in mathematics. For each independent variable, this ratio is determined. A high VIF shows that the linked independent variable has a high degree of collinearity with the model's other variables.

Table IX: VIF test of multicollinearity

| Variable | VIF | Tolerance |
|----------|------|-----------|
| COMP | 2.5 | 0.399 |
| SIZE | 2.44 | 0.410 |
| MBR | 1.36 | 0.738 |
| TQ | 1.31 | 0.763 |
| Pandemic | 1.27 | 0.787 |
| PMP | 1.17 | 0.855 |
| DSTR | 1.17 | 0.858 |
| LTAC | 1.15 | 0.866 |
| LEV | 1.14 | 0.880 |
| LD | 1.11 | 0.899 |
| EXTF | 1.04 | 0.963 |
| AOC | 1.02 | 0.984 |
| ROA | 1.01 | 0.991 |
| Mean VIF | 1.32 | |

Multicollinearity might be an issue in a regression model since we won't discern between the independent variables' impacts on the dependent variable. VIF starts at 1 and has no maximum limit, according to conventional norms. There is no association between the independent and other variables when the VIF value is 1. When the VIF is more than 5 or 10, there is a lot of multicollinearity between one independent variable and the others Snee, Ron (1981). Our results, displayed in table IX, reveal that no variables have a VIF greater than 5, indicating no multicollinearity concern.

Test of homoscedasticity

Table X: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

| Particulars | Accrual-Earnings Management model | Real-Earnings Management model |
|--------------------------|-----------------------------------|--------------------------------|
| Chi ² | 0.08 | 1.53 |
| Prob. > Chi ² | 0.774 | 0.216 |

The homoscedasticity of our observations is checked using the Breusch-Pagan (1979) test. Because ordinary least squares (OLS) regression implies that all residuals are obtained from a population with fixed variance

(homoscedasticity). Homoscedasticity, also known as homogeneity of variances, is the concept that variations in various groups are equal or comparable. This is a crucial assumption because parametric statistical tests are sensitive to any dissimilarity. Biased and skewed test findings originate from unequal variances in samples. The basic indicator of the Breusch-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 shown in table X reveal a p-value greater than 0.05 ($P > 0.05$), indicating homoscedasticity of variance.

CONCLUSION

This study examines the association between CEO compensation and earnings management from the context of a developing economy, Bangladesh. The study finds that firms tend to engage less in earnings management during the pandemic period.

CEO compensation demonstrates a significantly negative relationship with accrual and real earnings management. Interestingly, CEO compensation and covid-19 pandemic jointly affect real-earnings management significantly positively. This study contributes to the corporate governance literature providing practical insights into the impact of diverse characteristics of CEO on earnings management. The study's findings can be helpful for corporate governance researchers to extend the understanding of the impact of corporate governance mechanisms from the developing country context. The findings of this study can pave the way for policymakers to reform reporting practices and CEO-related policies to protect the interests of the stakeholders, including shareholders.

However, the study's findings should be generalized carefully by considering some aspects. For instance, first, our study did not consider all listed companies but rather was based on the non-financial institutions only operating in Bangladesh due to the lack of information and the complexity in data collection. Second, our study was limited to understanding the influence of CEO compensation only on earning management. However, other factors include the ruling government's national culture and political ideology, and employees' characteristics may impact earnings management. Finally, this study was limited to one developing economy context. Therefore, further research within the CEO's compensation and earnings management based on a large sample size from multiple developing economy contexts, considering other factors relating to national and political culture and the personal characteristics of the higher-level managerial people, may improve the understanding within the field of interests.

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