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Factors Influencing Earnings Management: A Study of Bangladeshi Publicly Traded Firms

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Abstract This study aims to identify the determinants of earnings management with a comprehensive sample of publicly traded companies in Bangladesh. The empirical study employed absolute discretionary accruals for earnings management, per literature. Opportunistic behaviour, monitoring procedures, and financial difficulty may affect earnings management. This study examined 240 publicly traded Bangladeshi companies from 2018 to 2022. The results show that free cash flow and profitability influence earnings management in Bangladeshi publicly listed enterprises. The study showed that earnings management is common when Bangladeshi enterprises are struggling. The findings of the study state that when Bangladeshi companies face financial difficulties, they frequently control their earnings. Contrary to what has been documented in the literature, the empirical results also imply that dividend payment, a monitoring mechanism, positively enhances earnings management. Specifically, the findings show that managers of publicly traded companies in Bangladesh are more prone to manipulate numbers when their company is doing well and has free cash flow and larger profits. This study explains earnings management variables well. It will provide authorities with information to tighten laws and regulations, boosting public trust in financial reporting.

Keywords: *Earning management, Opportunistic Behaviour, Monitoring mechanisms, and Financial Distress*

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1. Introduction

Publicly listed corporations must regularly report financial accounts so stakeholders can make informed judgments. The stakeholders' decision-making process centers on accounting earnings. Internal and external stakeholders decide corporate policy, capital budgeting, fundraising, and managerial pay. These stakeholders rely on financial accounts, especially accounting profit information. Financial reporting transparently explains the organization's resource allocation and operational economics to stakeholders. Since internal users, particularly managers, have direct access to the organization's financial information, they can present earnings that deviate from actual earnings to serve their interests. Organizational managers use earnings management. Earnings management is the systematic manipulation of financial statement earnings by managers within GAAP. Today, policymakers, regulators, practitioners, and academics focus on earnings management. Financial scandals like the Enron Scandal (2001), the Satyam Scandal (2009), and Toshiba Accounting Scandal (2015) have raised awareness. Earnings management has caused several financial scandals. Thus, understanding its causes is crucial. Specifically, managers' earnings management practices and motivations must be examined. Numerous empirical researchers like Elias (2002), Marra, Mazzola, and Prencipe (2011), Fernandes and Ferreira (2007), and Salah and Jarboui (2022) have examined these questions [1,2,3,4].

Academic scholars, regulatory organizations, and industry professionals are interested in earnings management because of its potential effects on financial transparency, investor trust, and market stability. Like most developing nations, Bangladesh has undergone significant economic and structural changes. Organizations' incentives and methods to regulate reported earnings alter with their business environment. Its forms, motivations, and effects on Bangladeshi enterprises are understudied. Given this backdrop, understanding the fundamental factors that affect earnings management techniques in Bangladeshi organizations is critical. To better understand Bangladeshi business financial reporting, this empirical study examines how opportunistic behaviour, monitoring procedures, and financial crisis affect earnings management. Finally, this study seeks to add to the literature and illuminate Bangladeshi enterprises' unique issues and dynamics.

1.1. Objectives of the Study

This study aims to determine the main elements affecting earnings management in Bangladeshi public enterprises. This empirical investigation would help explain earnings management factors. Thus, it would help authorities tighten rules and laws, boosting public trust in financial reporting. This research should benefit investors and regulators that monitor financial reporting standards. Additionally, this research seeks to enrich the academic literature on earnings management. This study will improve understanding of financial reporting requirements and corporate governance by offering empirical facts and nuanced insights applicable to Bangladesh.

2. Literature Review and Hypothesis Development

Earning Management

Accounting communicates and quantifies financial data to those who make decisions. Internal and external accounting depend on who gets the information—creditors, lenders, regulators, or the general public. Corporate decision-making is aided by internal accounting when analyzing profitability and evaluating projects. External accounting lets Stakeholders make informed judgments regarding their interactions with the company. Informed decisions about future investments, tax liabilities, business partnerships, and employment must be made by consumers, suppliers, regulators, investors, creditors, and employees with the assistance of external accounting (Watts & Zimmerman, 1986). Data from external accounting is prepared and distributed by managers [5]. The data is compiled by managers who are knowledgeable about the business and present situation of the company So they can fairly and accurately report on the company's operational and financial performance.

Previous studies have illuminated earnings management's definition. Early earnings management definitions were from Schipper (1989) [6]. Schipper (1989) defines it as "purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain." As stated by Healy and Wahlen (1999), "Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence the contractual outcome that depends on reported accounting numbers [7]."

Akber (2019) found that earnings management requires managerial discretion to change accounting estimations and principles [8]. Dechow and Skinner (2000) state that managers can use their judgment and discretion to choose from various accounting methods and make estimates within them [9]. Profit management is possible via accruals. Total accruals are strongly linked to earnings management, although not all components are. Total accrual will be split in half. Management estimates the economic performance of organizations in the first section, non-discretionary accrual (normal accrual) (Abd. Rahman & Mohamed. Ali, 2006).

Management also controls discretionary accruals, which are limited by accounting standards (Amman et al., 2006). Discretionary accruals will determine the earnings management practice. Studies like Frankel, Johnson, and Nelson (2002), Mohd.Saleh, Iskandar, and Hassan (2005), and Abd.Rahman and Mohamed Ali (2006) have used discretionary accruals to measure earnings management. However, there are various methods for controlling earnings without accruals. Ratsula (2010) lists four earnings management methods [10]. Bathing is the first method. This strategy causes management to record bigger losses to increase the possibility of future profit.

Income reduction is another method. Profitable companies use this method to reduce political pressure and income tax. Management must increase expenses to minimize reported income using this method. Income maximization is another option. This model prioritizes managers above shareholders. Income smoothing is the last option. Using the strategy was intended to reduce income fluctuations. According to Ratsula (2010), management usually refuses to disclose low-reported results, which smoothens profits. Management's goals determine earnings management practices [11].

Managers may control earnings for many reasons. Duncan (2001) states that firms engage in earnings management when they have abnormally large profits or fail to reveal a fall in income. Aman et al. (2006) found that debt covenants, political cost, internal finance, and equity ownership manipulate profitability [12]. This study assumes that management engages in earnings management to avoid disclosing losses or decreasing earnings. According to Shuto (2007), this strategy is meant to project market success and competence to amaze the market and the public [13].

Opportunistic Behavior

Opportunistic managers might manipulate financial statistics to disguise bad performance and appear successful. This study evaluates managers' opportunistic free cash flow and profitability behaviour. Companies with extra free cash flow control income with discretionary accruals. Excess free cash flow may lead managers to increase earnings, demonstrating financial flexibility, according to Bukit and Iskandar (2009) [14]. Agencies with high free cash flow and modest growth potential are prone to the agency conundrum. According to Gul and Tsui (1998) and Chung et al. (2005), managers routinely alter income to boost earnings [15]. Stulz (1990) found that firms lend more without a cash flow gap [16]. Managers can spend free cash flow in profitable ventures rather than let it sit. According to Gul (2001), institutional shareholders, lenders, boards of directors, audit committees, and other stakeholders can monitor and discipline corporate managers with surplus cash flow and limited growth prospects to reduce unproductive investments.

Managers often overstate earnings to boost investor confidence and offer prices (Rahman & Abdullah, 2005). Managers of companies experiencing a profit slump also smooth results (White, 1970). Managers must control earnings when income varies and profitability drops (Ashaari, Koh, Tan & Wong, 1994) [17,18]. Dennis and Michel (1996) identified three earnings management objectives [19]. Reduce political costs, reduce the firm's

financial cost, and maximize manager remuneration and well-being. Managers must utilize earnings management approaches that support one of these goals.

These reasons lead to the following hypotheses,

H1: Free cash flow significantly improves earnings management.

H2: Profitability boosts earnings management significantly.

Monitoring Mechanism

Monitoring strategies include internal and external monitoring. The board of directors and internal audit committee supervise the corporation internally. These bodies ensure internal control efficacy to reduce management opportunism and earnings management. Dutch publicly traded corporations have lower anomalous accruals due to effective internal Control, according to Van de Poel and Vanstraelen (2007). External monitoring, on the other hand, comes from outside the company [20].

A company's "leverage" is how much debt it uses to fund its assets and activities. Strategic leverage can regulate excessive profit management, protecting the company's long-term health. According to Andrade and Kaplan (1998), companies with high leverage are more likely to run into financial problems, fail on loan payments, and go bankrupt. Jensen (1991) also suggested that new laws and an economic downturn could affect high-leverage companies [21]. Thus, heavily leveraged companies are worse off. The company may choose a greater leverage ratio if its debt exceeds the acceptable debt value (Shubita & Alsawalhah, 2012) [21]. Shubi and Alsawalhah (2012) found a positive correlation between debt ratio and risk. As the debt ratio rises, so does the interest rate.

Previous research shows that defaulting corporations manipulate accounting more than non-defaulters. Managers intentionally employ accounting options to prevent loan covenant violations, mainly to boost reported income; according to Sweeney (1994), Dichev and Skinner (2002), Beatty and Weber (2003), and Christie (1990), leverage affects accounting technique choice [23,24,25,26,27]. For high-leverage businesses seeking new loans, lenders will use tight standards and carefully analyze several factors. Managers must control profits (Zagers-Mamedova, 2009) [28]. Dechow & Skinner (2000) say managers might affect results by choosing permissible accounting processes and guessing because they are hard to measure.

Since Modigliani and Miller (1961), dividends and firm value have been extensively studied. Previous research has assumed that dividend announcements and yield measurements affect a firm's value (Frankfurter and Wood Jr., 2002; Docking and Koch, 2005). La Porta et al. (2000) found that minority shareholders forced company insiders to disclose cash reserves and issue dividends. The findings support the agency hypothesis, which states that insiders may use revenues for personal gain or invest them in unprofitable ventures that benefit them. Thus, external shareholders prefer dividends to earnings. Therefore, dividends may reduce agency conflicts between firm insiders and external shareholders.

Rozeff (1982) says dividends reduce managerial discretion. This step is crucial to the firm's best monitoring bonding package. Easterbrook (1984) stated that raising dividend payments could lower agency costs by forcing management to seek external finance and market scrutiny. A drop in agency charges should improve its value. This study suggests that firms pay dividends when cash flows are high to reduce managerial overinvestment. This may work in rising economies like Malaysia after corporate governance changes. The factors suggest the following hypothesis,

H3: Leverage hurts earning Management

H4: Earnings management negatively affects dividend payment

Financial Distress

A distressed firm is expected to struggle to pay its financial obligations shortly. According to Ignatov (2006), the corporation may go bankrupt or restructure [29]. Md. Zeni and Ameer (2010) define financial distress firms as companies whose creditors' agreements or contracts are not working as expected or are having significant issues [30]. According to Hu and Ansell (2005), distressed organizations have a debt ratio >1 or an interest cover ratio <1, depending on cash flow [31]. The first definition is stock-based insolvency, where obligations exceed assets. The second definition is flow-based insolvency, where operating cash flow falls below the minimum. In all cases, a severe circumstance can lead to bankruptcy. Most unhealthy businesses are struggling due to the recession, a typical financial crisis effect (John & John, 1992). However, "creative accounting" or accounting methodology changes are causing some organizations to perform poorly owing to foreign competition and internal financial issues. According to Asquith, Gertner, and Scharfstein (1994), three causes contribute to a firm's financial crisis. According to the study, financial strain was primarily caused by poor firm-specific performance. Financial issues were then linked to poor industrial performance and high leverage. Asquith et al. (1994) and Andrade and Kaplan (1998) reported comparable results. They blamed high-leverage trades for financial hardship. The company's cash constraint is caused by high debt to pay financial obligations. Opler and Titman (1992) observed that industrial slumps exacerbate extremely indebted enterprises' financial troubles, forcing them to hedge.

Jaggi and Lee (2002) say discretionary accruals enhance or decrease revenue depending on financial distress. Short financial difficulties are positively connected with management employing income-increasing discretionary accruals [32]. If the economic crisis lasts, accruals are less likely. Companies near bankruptcy often mislead data with income-decreasing profitability management. Due to years of upward earnings management, many companies can no longer alter numbers. Therefore, firms must utilize income-reducing earnings management. Inconclusive research on company crisis and earnings management exists. With various evidence, the following idea is given,

H5: Financial turmoil hurts earnings management.

3. Research Methodology

3.1. The Sample

This study used data from 2018 to 2022 for the Dhaka Stock Exchange-listed firm. A 2018 period The study sample includes 15 of 18 Dhaka Stock Exchange main board industrial sectors. Due to their different reporting styles and earnings management methods, banks, financial institutions, and insurance are excluded from this work. Initial samples included 1200 firm years. After removing missing values owing to data unavailability or private firms, the final sample was 1047 company years. Finally, the structured panel data collection had 925 firm years of usable sample.

3.2. Variables

3.2.1. Dependent Variable

The study examines earnings management factors. Thus, profit management is this study's dependent variable. The common earnings management measure is abnormal discretionary accruals (DAi,t). According to Kothari et al. (2005), aberrant discretionary accruals will be measured using the modified Jones model with current-year ROA. First, the company's total accrual (TAi,t) in year t must be evaluated to establish aberrant discretionary accruals. The equation for total accrual follows.

$$TA_{i,t} = \left(\frac{\Delta CA_{i,t}}{A_{i,t-1}} - \frac{\Delta Cash_{i,t}}{A_{i,t-1}}\right) - \left(\frac{\Delta CA_{i,t}}{A_{i,t-1}} - \frac{\Delta STD_{i,t}}{A_{i,t-1}}\right) - \frac{DEP_{i,t}}{A_{i,t-1}} \quad \text{(i)}$$

The variables used in the equation (i) are demonstrated in Table 1,

Table 1. Variable Details of Equation (i)

Variables	Details
$\Delta CA_{i,t}$	Change of current asset for firm i, between year t-1 and year t
$\Delta Cash_{i,t}$	Change of cash for firm i, between year t-1 and year t
$\Delta CL_{i,t}$	Change of current liabilities for firm i, between year t-1 and year t
$\Delta STD_{i,t}$	Change of short-term debt for firm i, between year t-1 and year t
$DEP_{i,t}$	Depreciation and amortization expenses for firm i, year t
$A_{i,t-1}$	Total assets for firm i, year t-1

To overcome heteroscedasticity, in equation (i), all the variables are scaled by total assets for firm i, year t-1.

Following the Kothari et al. (2005) model, a regression will be run using equation (ii) to determine the earnings management [33].

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \alpha_4 \frac{ROA_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad \text{(ii)}$$

The variables used in the equation (ii) are demonstrated in Table 2.

Table 2. Variable Details of Equation (ii)

Variable	Details
$TA_{i,t}$	Total accounts for firm i, year t-1
$\Delta REV_{i,t}$	Change of revenue for firm i, between year t-1 and year t
$\Delta AR_{i,t}$	Change of account receivable for firm i, between year t-1 and year t
$PPE_{i,t}$	Property, plant, and equipment for firm i, year t-1
$ROA_{i,t}$	Return on assets for firm i, year t
$A_{i,t-1}$	Total assets for firm i, year t-1

To calculate the parameters (α1, α2, α3, α4), run the regression. This model treats residuals or equation prediction errors as discretionary accruals or earnings management. Afterward, the abnormal discretionary accruals (DAi,t) will be the difference between the actual total accruals and the normal accruals estimated from equation (ii). Equation (iii) calculates atypical discretionary accruals (DAi,t):

$$DA_{(i,t)} = TA_{i,t} - \left[\hat{a}_1 \frac{1}{A_{i,t-1}} + \hat{a}_2 \frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} + \hat{a}_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \hat{a}_4 \frac{ROA_{i,t}}{A_{i,t-1}}\right] \quad \text{(iii)}$$

To emphasize the magnitude of the earnings management, the absolute value of the discretionary accrual will be used in this study as the measure of earnings management,

$$ADA_{i,t} = \left|DA_{i,t}\right| \quad \text{(iv)}$$

High absolute discretionary accruals suggest earnings management and lower accounting quality in equation (iv). Conversely, fewer absolute discretionary accruals reflect better accounting and less earnings management. Multiple research studies have been conducted, including those by Abdul Rahman & Wan Abdullah (2005), Carramanis & Lenox (2008), and Mohd. Ali, Mohd. Salleh & Hassan (2008) use this earnings management measurement [34].

3.2.1. Independent and Control Variables

Based on the hypothesis developed in the literature review part. The determinants are divided into opportunistic behaviour, monitoring mechanisms, and financial distress. The following set of independent variables are used for testing the hypotheses of this study,

Table 3. Independent and Control Variables List

Particulars	Variable	Variable Type	Notation
Opportunistic behaviors	Free Cash Flow (Scaled by Ai,t-1)	Independent	FCF
Opportunistic behaviors	Profitability	Independent	ROA
Monitoring mechanism	Leverage (Debt Ratio)	Independent	LEV
Monitoring mechanism	Dividend (Dividend Payout Ratio)	Independent	DPR
Financial Distress	Financial Distress (Alman Z)	Independent	Z
Size	Log (Total Asset)	Control	SIZE

The formulas used to calculate the independent variables and control variables are provided below,

$$FCF_{i,t} = Cash\ Flow\ from\ Operation_{i,t} - CapEX_{i,t} - \Delta Working\ Capital_{i,t} \quad (v)$$

$$ROA_{i,t} = \frac{Net\ Income_{i,t}}{Total\ Asset_{i,t}} \ldots\ldots\ldots (vi)$$

$$LEV_{i,t} = \frac{Total\ Debt_{i,t}}{Total\ Asset_{i,t}} \ldots\ldots\ldots (vii)$$

$$DPR_{i,t} = \frac{TotalDivident_{i,t}}{NetIncome_{i,t}} \ldots\ldots\ldots (viii)$$

$$DPR_{i,t} = \frac{TotalDivident_{i,t}}{NetIncome_{i,t}} \ldots\ldots\ldots (viii)$$

$$Z_{i,t} = 3.3\frac{EBIT_{i,t}}{TotalAsset_{i,t}} + 1.2\frac{NetWorkingCapital_{i,t}}{TotalAsset_{i,t}} + 1.0\frac{Sales_{i,t}}{TotalAsset_{i,t}} + 0.6\frac{MarketValueofEquity_{i,t}}{BookValueofDebt_{i,t}} + 1.4\frac{RetainEarnings_{i,t}}{TotalAssets_{i,t}} \ldots\ldots\ldots (ix)$$

$$Z_{i,t} = 6.56\frac{NetWorkingCapital_{i,t}}{TotalAsset_{i,t}} + 3.26\frac{RetainEarning_{i,t}}{TotalAsset_{i,t}} + 1.05\frac{EBIT_{i,t}}{TotalAsset_{i,t}} + 6.72\frac{BookValueofEquity_{i,t}}{TotalLiabilities_{i,t}} \ldots\ldots\ldots (x)$$

$$SIZE_{i,t} = \log\left(TotalAsset_{i,t}\right) \ldots\ldots\ldots (x)$$

Equations (v) and (vi) represent the opportunistic behaviour of free cash flow to firm and profitability, respectively. Furthermore, equations (vii) and (viii) represent the monitoring mechanism by leverage and dividend payout ratios, respectively. Equations (ix) and (x) are developed for financial distress. Both equations represent financial distress through the Altman Z score. Here, equation (ix) represents the economic distress of the manufacturing firm, and equation (x) represents the financial distress of the non-manufacturing firm. For manufacturing firms Z score below 1.81 will indicate that the firm is in distress, above 2.67 indicates the firm is in a healthy position, and between 1.81 and 2.67 will indicate the firm is in a grey area. On the contrary, for non-manufacturing firms Z score below 1.23 will indicate that the firm is in distress, above 2.90 indicates the firm is in a healthy position, and between 1.23 and 2.90 will indicate the firm is in a grey area.

3.3. Research Model

In order to analyze the variables that play an important role in explaining the level of earnings management, the following model is estimated:

$$ADA_{i,t} = \beta 0 + \beta 1 FCF_{i,t} + \beta 2 ROA_{i,t} + \beta 3 LEV_{i,t} + \beta 4 DPR_{i,t} + \beta 5 Z_{i,t} + \beta 6 SIZE_{i,t} + \varepsilon_{i,t} \ldots\ldots (v)$$

3.4. Stationary Test

For running the regression, all the independent, dependent, and Control variables must be at their stationary level. Multiple tests were run to test the stationary level of the variables, and the results are summarized in Table 4. The detailed results are provided in Appendix A1.

Table 4. Summary of Stationary Test

Variables	LLC	LM	ADF	PP	Stationary Level
ADA	0.0000*	0.0000*	0.0000*	0.0000*	I(0)
FCF	0.0000*	0.0000*	0.0000*	0.0000*	I(0)
ROA	0.0000*	0.0000*	0.0245*	0.0000*	I(0)
LEV	0.0000*	0.0000*	0.0000*	0.0000*	I(0)
DPR	0.0000*	0.0000*	0.0000*	0.0000*	I(0)
Z	0.0000*	0.0000*	0.0003*	0.0000*	I(0)
SIZE	0.0000*	0.0000*	0.0000*	0.0000*	I(0)

LLC = Levin, Lin & Chu t*
L.M. = Lm, Pesaran and Shin W-stat ADF = ADF - Fisher Chi-square PP PP= PP - Fisher Chi-square

Based on the multiple stationary test results, all the variables used in the study will be stationary at this level. So, the data on their level will be used for the regression analysis.

3.5. Statistical Tools

This study uses panel data and regression analysis to discover earnings management factors. Based on it, Panel Ordinary Least Square, Random Effect Model, and Fixed Effect Model regression analysis will be done. Unstructured panel data of 1047 business years was used for a Panel Ordinary Least Square regression. Provided that structured panel data of 925 firm years yields better findings, Panel Ordinary Least Square, Random Effect Model, and Fixed Effect Model regression analysis were done. We use the Breusch-Pagan and Hausman tests to choose a model for this investigation. Other diagnostic tests include VIF, Durbin-Watson stat, and Cook-Weisberg test for multicollinearity, serial autocorrelation, and heteroscedasticity. Data analysis uses EViews and Stata.

4. Empirical Analysis and Findings

4.1. Earnings Management

4.1.1. Descriptive Statistics

Before analyzing this study, earnings management must be determined. Equation (i) is used to accomplish this. Table 5 shows the descriptive statistics for earnings management, the independent variable in this study. The descriptive analysis quantitatively explains earnings management variables. The minimum, maximum, mean, and standard deviation for each study variable are shown in this table. Earnings management uses absolute discretionary accrual. Total accruals range from -219.07 to

8.16, according to empirical results. Total accruals average -0.27 with a standard deviation of 6.81.

Table 5. Descriptive Statistics – Earnings Management

	N	Mean	Median	Maximum	Minimum	Std. Dev.
TA	1047	-0.2656	-0.0129	8.1587	-219.0666	6.8105
$1/A_{t-1}$	1047	0.0021	0.0003	0.1415	0.0000	0.0109
$(\Delta REV - \Delta AR)/A_{t-1}$	1047	-0.0337	0.0116	52.1156	-75.5036	3.3480
PPE/A_{t-1}	1047	0.7503	0.4860	169.4170	0.0000	5.4790
ROA/A_{t-1}	1047	0.0022	0.0000	0.9881	-0.0192	0.0368

4.1.2. Panel Least Square Regression

Using equation (ii) as suggested by Kothari et al. (2005), a multiple linear regression was run, and the result is presented in Table 6. All the variables used were stationary at the level (Appendix A1). The method used here is the panel least square regression with unbalanced 1047 panel observations.

Table 6. Panel Least Square Regression (2018-2022)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$1/A_{t-1}$	41.36763	9.546633	4.333217	0.0000*
$(\Delta REV - \Delta AR)/A_{t-1}$	0.621458	0.031473	19.74599	0.0000*
PPE/A_{t-1}	-0.944830	0.015139	-62.41036	0.0000*
ROA/A_{t-1}	-30.60336	2.996148	-10.21423	0.0000*
R-squared	0.921925			
Adjusted R-squared	0.921701			
Included observations: 1047 Dependent Variable: T.A. Independent Variables: $1/A_{t-1}$, $(\Delta REV - \Delta AR)/A_{t-1}$, PPE/A_{t-1}, ROA/A_{t-1}				

Table 6 shows 92.19% R-squared. The fraction of independent variable variability explained by the independent variable is R-squared. Independent variables explain 92.19% of total accrual variability. Moreover, all independent variables significantly correlated with total accrual ($p=0.0000$, $p<0.05$). The regression residuals indicate earnings management; thus, the goal is to find them. Appendix A2 shows earnings management residuals. Abnormal discretionary accruals are residual outliers. Initially, this study will focus on earnings management's magnitude using its absolute value. The dependent variable of this study, absolute discretionary accruals indicating earnings management, is calculated by adjusting the outliers and taking the absolute value of the residuals. Appendix A3 shows absolute discretionary accruals.

4.2. Sector Wise Earnings Management

The study is conducted focusing on 15 industrial sectors listed in DSE. Financial sectors are excluded from the study because of their separate style of reporting and separate earnings management measures. For sector-wise earrings management, the descriptive statistics of earnings management of each sector are represented in Table 7, including the number of firms under each sector, mean, median, maximum, minimum, standard deviation, 1st quartile, and 3rd quartile.

Table 7 shows that the "Fuel & Power" and "Travel & Leisure" industries have combined the highest mean absolute discretionary accruals, i.e., earnings management, with a value of 0.64. With a mean value of 0.61, the "Service & Real Estate" sector is also considerably engaged in earnings management. On the contrary, "Tannery Industries" has the lowest mean absolute discretionary accruals, i.e., earnings management. "Jute," "I.T. Sector," and "Miscellaneous" also have a low mean value of earnings management. In addition, the "Miscellaneous" sector has the lowest standard deviation, 0.11, with a mean value of 0.39, indicating that earnings management is comparatively low in this sector. Another sector with low earnings management is "Tannery Industries," which has a mean value of 0.31 and a standard deviation of 0.18. Moreover, the maximum and minimum earnings management can be observed in firms under "Engineering," "Food & Allied," "Fuel & Power," "Miscellaneous," and "Textile" industries.

Table 7. Sector Wise Earnings Management

Sector	N	Mean	Median	Maximum	Minimum	St. Dev.	25%	75%
Cement	35	0.41	0.36	0.93	0.05	0.24	0.26	0.57
Ceramics Sector	25	0.42	0.54	0.68	0.03	0.19	0.27	0.57
Engineering	196	0.48	0.43	2.00	0.00	0.38	0.23	0.61
Food & Allied	95	0.58	0.39	2.00	0.00	0.59	0.18	0.71
Fuel & Power	99	0.64	0.56	2.00	0.00	0.46	0.41	0.78
IT Sector	49	0.34	0.33	0.75	0.02	0.19	0.17	0.50
Jute	8	0.32	0.32	0.48	0.15	0.11	0.27	0.40
Miscellaneous	68	0.39	0.29	2.00	0.00	0.42	0.11	0.54
Paper & Printing	22	0.53	0.51	1.00	0.07	0.31	0.21	0.78
Pharmaceuticals & Chemicals	144	0.48	0.50	1.18	0.01	0.25	0.29	0.64
Service & Real Estate	15	0.61	0.69	1.11	0.17	0.33	0.22	0.85
Telecommunication	15	0.49	0.52	0.86	0.24	0.17	0.35	0.59
Tannery Industries	23	0.31	0.31	0.64	0.02	0.18	0.18	0.43
Textile	236	0.46	0.45	2.00	0.00	0.22	0.33	0.56
Travel & Leisure	17	0.64	0.72	0.91	0.01	0.27	0.62	0.81

Table 8. Descriptive Statistics

Sector	N	Mean	Median	Maximum	Minimum	St. Dev.	25%	75%
ADC	1047	0.48	0.44	2.00	0.00	0.35	0.26	0.61
FCF	1047	0.17	0.00	117.43	(4.84)	3.76	(0.06)	0.06
ROA	1047	0.03	0.02	7.34	(4.05)	0.34	0.01	0.06
LEV	1047	0.38	0.25	9.69	0.00	0.80	0.07	0.42
DPR	1047	0.68	0.33	86.80	(33.72)	4.26	0.00	0.68
Z	1047	3.31	3.60	5.00	0.50	1.75	1.59	5.00
SIZE	1047	3.57	3.54	5.64	0.85	0.78	3.15	4.05

Table 9. Panel Ordinary Least Square Regression (Unbalanced Data)

Model	Coefficient	Std. Error	t-Statistic	Prob.	Tolerance	VIF
(Constant)	0.447838	0.059210	7.563507	0.0000		
FCF	0.015651	0.002694	5.810101	0.0000*	0.79	1.26
ROA	0.270671	0.030755	8.800877	0.0000*	0.83	1.20
LEV	0.127487	0.014229	8.959953	0.0000*	0.90	1.11
DPR	0.004434	0.002384	1.860328	0.0631	0.90	1.11
Z	0.003467	0.006311	0.549404	0.5828	0.99	1.01
SIZE	-0.010725	0.013613	-0.787855	0.4310	0.99	1.01
R-squared	0.153690					
Adjusted R-squared	0.148808					
F-statistic	31.47743					
Prob (F-statistic)	0.000000*					
Durbin-Watson stat	0.770352					

Included observations: 1047
a. Dependent Variable: ADA
b. Independent Variables: FCF, ROA, LEV, DPR, Z

4.3. Determinants of Earnings Management

4.3.1. Descriptive Statistics

The core objective of this study is to find out the determinants of earnings management. Table 8 represents the descriptive statistics of the independent, dependent, and Control variables used in the equation (v).

According to the descriptive statistics represented in Table 8, earnings management ranges from 0.00 to 2.00. The mean earnings management is 0.48, which is comparatively high in relation to the study conducted by Abdul Rahman & Mohd. Ali (2006) and Mohd. Yusof (2010) [35,36,37,38]. Their study reports the mean earnings management of 0.0132 and 0.165, respectively, which is considerably low compared to the earnings management of Bangladeshi firms. It reflects that an average publicly listed firm in Bangladesh engages in earnings management. The mean value of return on asset is 3% with a standard deviation of 34%, indicating that the return on asset is widely dispersed. This fact is also evident from the minimum and maximum value of return on assets. The mean value of the Altman Z score is 3.31, which is higher than both required values to be classified as a healthy firm, namely 2.67 for manufacturing firms and 2.90 for non-manufacturing firms. Thus, an average firm in Bangladesh is unlikely to face financial distress soon. Based on the result, 56.92% of the firms are in the healthy zone while 14.23% of firms are in the area, and finally, 28.84% of firms are in the distress zone. The mean leverage value is 0.38, indicating that the average firm in Bangladesh finances 38% of its assets with debt.

4.3.2. Panel Ordinary Least Square Regression (Unbalanced Data)

Multiple linear regression analyses were used for hypothesis testing using equation (v) with the usable 1047 firm years' data, and an ordinary panel least square regression was initially run based on the unstructured data. The result of the regression is provided in Table 9.

The result in Table 9 presents an R square of 15.37%, indicating that 15.37% variability in ADA can be explained by independent and Control variables, namely FCF, ROA, LEV, DPR, Z, and SIZE. Nevertheless, it should be noted that a lower R square is typical in such accrual regression. Based on the result of Table 5, hypotheses 1 and 2 can be accepted as free cash flow and return on asset both show a positive association with earnings management, and the result is also significant ($p = 0.0000$, $p<0.05$). On the contrary, hypothesis 3 is rejected as the result shows a significant positive relationship between leverage and earnings management ($p = 0.0000$, $p<0.05$), whereas the hypothesis suggests a negative relationship between leverage and earnings management should exist. The positive relationship between leverage and earnings management can be associated with the fact that to satisfy the debt covenants and represent the firm strongly in front of stakeholders, and the managers are engaging in earnings management. Hypothesis 4 gets rejected as the results are not significant:

($p = 0.0631$, $p>0.05$). For the same reason, hypothesis 5 gets rejected as the results are insignificant ($p = 0.5828$, $p>0.05$). Nevertheless, the Control variable firm size represents an insignificant negative association with earnings management ($p = 0.4310$, $p>0.05$). Furthermore, the VIFs of the independent and Control variables are below 3, indicating no multicollinearity problem.

Lastly, the Prob(F-statistic) also shows that the model represents significant results between the independent and dependent variables ($p<0.05$).

4.3.3. Panel Ordinary Least Square Regression (Balanced Data)

In the case of panel data, more accurate results can be found if the proper regression model is implemented with the balanced panel data. As a result, another panel ordinary least square regression is run with balanced panel data of 5 periods and 185 cross-sections consisting of 925 firm years' data. The result of this regression is provided in Table 10.

Table 10 shows 13.53% R square. Independent factors and control variables FCF, ROA, LEV, DPR, Z, and SIZE explain 13.53% of ADA, earnings management, and variability. This result shows poorer independent and control variable explanatory power than unstructured panel ordinary least square regression. Hypothesis testing results remain unchanged. Hypothesis 1 and 2 are supported as free cash flow and return on asset positively correlate with earnings management, with significant results ($p = 0.0000$, $p<0.05$). Hypothesis 3 is rejected due to a substantial positive correlation between leverage and earnings management ($p = 0.0000$, $p<0.05$), contrary to the hypothesis predicting a negative correlation. Results are insignificant ($p = 0.0512$, $p>0.05$), rejecting Hypothesis 4. The non-significant finding rejects Hypothesis 5 ($p = 0.9510$, $p>0.05$). This time, the control variable isn't associated with the independent variable ($p = 0.2643$, $p>0.05$). Multiclonality is not a concern if independent and Control variable VIFs are below 3. The model outcome is significant ($p<0.05$) as indicated by the Prob (F-stat-) of 0.0000.

4.3.4. Breusch-Pagan Test

Multiple models can used for regression analysis with panel data. To identify whether the panel ordinary least square is the appropriate model in this study, the Breusch-Pagan test is run, and the test result is given in Table 11.

The significant value under cross-section ($p = 0.0000$, $p<0.05$) in Table 11 indicates that the panel ordinary least square regression is not an appropriate model for this study, and the cross-section random effect model needs to be run.

4.3.5. Cross-Section Random Effects Model

As suggested by the Breusch-Pagan Test, another regression is run using the cross-section random effect model with balanced panel data of 5 periods and 185 cross-sections consisting of 925 firm years' data. The result of this regression is provided in Table 12.

Table 12 shows that independent factors and control variables FCF, ROA, LEV, DPR, Z, and SIZE explain 4.24% of ADA earnings management variability. The independent variables' explanatory power decreased compared to Tables 9 and 10. As previously found, earnings management is positively correlated with free cash flow and return on asset ($p=0.0000$, $p<0.05$). The relationship between leverage and earnings management is no longer significant ($p=0.1165$, $p>0.05$), but the dividend payout ratio is significantly associated with earnings management ($p=0.0254$, $p<0.05$). This rejects hypotheses 3 and 4. If the Z score is negative and earnings management is insignificant ($p=0.1768$, $p>0.05$), hypothesis 5 is rejected. Finally, business size affects earnings management a little ($p=0.4836$, $p>0.05$). VIF scores below 3 indicate no multicollinearity.

Moreover, unlike the previous result, the Durbin-Watson stat is 1.60, between the ranges of 1.50 and 2.00, indicating no serial autocorrelation problem. Lastly, the Prob (F- statistic) also shows that the model represents significant results between the independent and dependent variables ($p<0.05$).

Table 10. Panel Ordinary Least Square Regression (Balanced Data)

Model	Coefficient	Std. Error	t-Statistic	Prob.	Tolerance	VIF
(Constant)	0.476548	0.063165	7.544524	0.0000		
FCF	0.015661	0.002700	5.801468	0.0000*	0.78	1.29
ROA	0.275056	0.031303	8.786880	0.0000*	0.80	1.24
LEV	0.128663	0.023671	5.435386	0.0000*	0.90	1.11
DPR	0.004672	0.002393	1.952572	0.0512	0.92	1.09
Z	-0.000419	0.006813	-0.061491	0.9510	0.98	1.02
SIZE	-0.015814	0.014159	-1.116891	0.2643	0.99	1.01
R-squared	0.135342					
Adjusted R-squared	0.129690					
F-statistic	23.94853					
Prob(F-statistic)	0.000000*					
Durbin-Watson stat	0.787282					

Included observations: 925 [Period: 5 x Cross Section: 185]
a. Dependent Variable: ADA
b. Independent Variables: FCF, ROA, LEV, DPR, Z

Table 11. Breusch-Pagan Test

Lagrange Multiplier Test for Random Effect			
Null Hypotheses: No effect			
Alternative hypotheses: Two-side (Breusch-Pagan) and one-sided (all others) alternative			
	Test hypothese		
	Cross section	Time	Both
Breusch-Pagan	526.5458	0.0419182	526.5956
	(0.0000)*	(0.8234)	(0.0000)

Table 12. Panel EGLS (Cross-section random effects)

Model	Coefficient	Std. Error	t-Statistic	Prob.	Tolerance	VIF
(Constant)	0.550192	0.097376	5.650170	0.0000		
FCF	0.008509	0.002005	4.243144	0.0000*	0.78	1.29
ROA	0.134295	0.029136	4.609274	0.0000*	0.80	1.24
LEV	0.047037	0.029938	1.571176	0.1165	0.90	1.11
DPR	0.005193	0.002320	2.238930	0.0254*	0.92	1.09
Z	-0.011836	0.008757	-1.351689	0.1768	0.98	1.02
SIZE	-0.016359	0.023341	-0.700885	0.4836	0.99	1.01
R-squared	0.042425					
Adjusted R-squared	0.036166					
F-statistic	6.778525					
Prob(F-statistic)	0.000000*					
Durbin-Watson stat	1.603126					

Included observations: 925 [Period: 5 x Cross Section: 185]
a. Dependent Variable: ADA
b. Independent Variables: FCF, ROA, LEV, DPR, Z

Table 13. Correlated Random Effects - Hausman Test

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test summary	Chi-Sq. Statistics	Chi – Sq. df.	Prob.
Cross Section Random	39.162114	.6	0.0000*

Table 14. Cross-Section Fixed Effect Model

Model	Coefficient	Std. Error	t-Statistic	Prob.	Tolerance	VIF
(Constant)	0.040363	0.259105	0.155780	0.8762		
FCF	0.004549	0.002143	2.122765	0.0341*	0.78	1.29
ROA	0.082747	0.032120	2.576153	0.0102*	0.80	1.24
LEV	0.009477	0.042354	0.223746	0.8230	0.90	1.11
DPR	0.005074	0.002583	1.964097	0.0499*	0.92	1.09
Z	-0.025228	0.012069	-2.090289	0.0369*	0.98	1.02
SIZE	0.142445	0.069690	2.043974	0.0413*	0.99	1.01
R-squared	0.705903					
Adjusted R-squared	0.629775					
F-statistic	9.272515					
Prob(F-statistic)	0.000000					
Durbin-Watson stat	1.992757					

Included observations: 925 [Period: 5 x Cross Section: 185]
a. Dependent Variable: ADA
b. Independent Variables: FCF, ROA, LEV, DPR, Z

4.3.6. Correlated Random Effects - Hausman Test

As mentioned earlier, selecting the appropriate model for panel data is important. In order to identify whether the Panel EGLS (Cross-section random effects) is the appropriate model for this study, the Hausman test is run, and the test result is given in Table 13.

The significant value in Table 13 ($p=0.0000$, $p<0.05$) indicates the Panel EGLS (Cross-section random effects) is not an appropriate model for this study, and the cross-section fixed effect model needs to be run.

4.3.7. Cross-Section Fixed Effect Model

As suggested by the Hausman Test, another regression is run using the cross-section fixed effect model with balanced panel data of 5 periods and 185 cross-sections consisting of 925 firm years' data. The result of this regression is provided in Table 14.

Table 14 represents the result of the cross-section fixed effect model. Here, the R square is 70.06%, indicating that 70.06% of the variability in earnings management can be explained by the independent variables, namely FCF, ROA, LEV, DPR, and Z. The explanatory power of the independent variables is much higher in this model than in previous models' results. The cross-sectional fixed effect is the appropriate model, so serial autocorrelation and heteroscedasticity have also been checked. The significant value in Cook- Weisberg test for heteroscedasticity ($p=0.0103$, $p<0.05$) indicates the dataset is homoscedastic (Appendix A4). Moreover, the Durbin-Watson Stat showing the result 1.99 within the range of 1.50 and 2.00 indicates no serial autocorrelation. In addition, the VIFs below 3 indicate no multicollinearity issue in the dataset.

Table 14 shows if Hypothesis 1 (H1), 2 (H2), 3 (H3), 4 (H4), and 5 (H5) are supported or rejected. The study hypothesized that earnings management improves free cash flow. Table 14 supports Hypothesis 1 as free cash flow positively correlates with earnings management, with significant results ($p=0.0341$, $p<0.05$). The study hypothesized that earnings management also boosts

profitability. Table 14 supports Hypothesis 2 as a return on asset, indicates a positive association between profitability and earnings management, and is significant ($p = 0.0102$, $p<0.05$). Free cash flow positively correlates with earnings management, suggesting managers may invest in low-yielding projects to control earnings. The positive correlation between profitability and earnings management suggests that managers of organizations with higher profitability will engage in earnings management to benefit from reported earnings through commissions or other means.

Leverage does not positively affect earnings management ($p=0.8230$, $p>0$), disproving Hypothesis 3. An insignificant and positive association between leverage-proxied monitoring methods is unexpected. The additional monitoring mechanism from external stakeholders from leverage should investigate corporate managers' activities. Keeping them from earnings management. Despite 38% of an average Bangladeshi firm's assets being financed by debt, no such relationship exists. According to Majumdar and Nagarajan (1997) and Ling et al. (2007), managers are less prone to manipulate earnings when external parties watch them [39]. However, Hypothesis 4 is unsupported despite a substantial ($p=0.0499$, $p<0.05$) outcome. A significant positive link between dividend-proxied monitoring systems contradicts the expected negative relationship with earnings management. Firm shareholders demand higher dividends to reduce managers' free cash flow. Managers will have less money for empire-building, entrenchment, and low-yielding projects, which should reduce earnings management. This study shows a strong positive correlation between profitability and earnings management. It happens due to management's attempts to inflate the firm's market value by boosting dividends.

It supports hypothesis 5 since the Altman Z score indicates a substantial negative correlation ($p=0.0369$, $p<0.05$) with earnings management. The result shows that troubled firm managers are unlikely to participate in earnings management, but healthy firm managers are. Table 8 shows that the average Bangladeshi corporation is healthy and manages earnings. Demirkan & Platt (2009) found similar results. Lack of ability to regulate and control earnings before financial difficulty is the main reason troubled companies don't manage earnings. Additionally, some corporations may not benefit from manipulating [40].

5. Conclusion

This survey sampled Bangladeshi public companies. Data was obtained from 15 of 18 industries during 2018-2022. Given their reporting approach and earnings management system, financial sectors were excluded from the study. Since some firms' data was unavailable and others were private, the initial sample was 1047 firm years. Structured panel data from 925 firm years with five periods and 185 cross-sections was usable. The cross-section fixed effect was the right model for the study. Regression model hypothesis 1 accepted 2 and 5 and rejected 3 and 4. The summary is in Table 15. The results indicate that managers of publicly listed Bangladeshi firms are likely to engage in earnings management when the firm has higher profit, free cash flow, and good health.

Table 15. Summary Result

Hypotheses	Details	Results		
		Relationship	P-value	Accept/ Rejected
H1	Free cash flow significantly improves earnings management.	Positive	0.0341 *	Accepted
H2	Profitability boosts earnings management significantly.	Positive	0.0102 *	Accepted
H3	Leverage hurts earning management.	Positive	0.8230	Rejected
H4	Earnings management negatively affects dividend payments.	Positive	0.0499 *	Rejected
H5	Financial turmoil hurts earnings management.	Negative	0.0369 *	Accepted

Earnings management by firm managers misrepresents operational performance and lowers the quality of reported financial information. This hinders investors, legislators, and regulators from making educated decisions about the firm. Thus, financial market efficiency suffers. These concerns have driven lawmakers and regulators to create rules and regulations to protect reported information. Doing so protects stakeholders who use reported information to make economic decisions. It will help the policymakers in regulating corporate financials to promote reliability.

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Appendix

A1 Stationary Test
A1a Variable: ADA
Series: ADC
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-276.435	0.0000*	195	769
Im, Pesaran and Shin W-stat	-28.7116	0.0000*	184	736
ADF-Fisher Chi-Square	670.295	0.0000*	195	769
PP- Fisher Chi-Square	772.230	0.0000*	195	769

A1b Variable: FCF
Series: SFCF

Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-45.5094	0.0000*	197	777
Im, Pesaran and Shin W-stat	-18.9430	0.0000*	186	744
ADF-Fisher Chi-Square	715.414	0.0000*	197	777
PP- Fisher Chi-Square	840.550	0.0000*	197	777

A1c Variable: ROA
Series: ROA
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-265.324	0.0000*	197	777
Im, Pesaran and Shin W-stat	-16.3154	0.0000*	186	744
ADF-Fisher Chi-Square	451.1624	0.0000*	197	777
PP- Fisher Chi-Square	587.6260	0.0000*	197	777

A1d Variable: LEV
Series: LEV
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-24.2349	0.0000*	190	749
Im, Pesaran and Shin W-stat	-6.9690	0.0000*	179	716
ADF-Fisher Chi-Square	515.6337	0.0000*	190	749
PP- Fisher Chi-Square	645.1307	0.0000*	189	749

A1e Variable: DPR
Series: DPR
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartlet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-51.0902	0.0000*	162	639
Im, Pesaran and Shin W-stat	-12.4993	0.0000*	153	612
ADF-Fisher Chi-Square	476.71976	0.0000*	162	639
PP- Fisher Chi-Square	562.13594	0.0000*	162	639

A1f Variable: Z
Series: Z
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-82.5675	0.0000*	104	411
Im, Pesaran and Shin W-stat	-11.0959	0.0000*	99	396
ADF-Fisher Chi-Square	285.9232	0.0000*	104	411

PP- Fisher Chi-Square	373.9005	0.0000*	104	411

A1g Variable: T.A.
Series: T.A.
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-135.4112	0.0000*	197	777
Im, Pesaran and Shin W-stat	-38.0494	0.0000*	186	744
ADF-Fisher Chi-Square	843.4714	0.0000*	197	777
PP- Fisher Chi-Square	1008.8053	0.0000*	197	777

A1h Variable: $\boldsymbol{1/A_{t-1}}$
Series: $\boldsymbol{1/A_{t-1}}$
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	19.7886	1.0000*	197	777
Im, Pesaran and Shin W-stat	-23.4078	0.0000*	186	744
ADF-Fisher Chi-Square	688.9712	0.0000*	197	777
PP- Fisher Chi-Square	900.0057	0.0000*	197	777

A1i Variable: $\boldsymbol{(\Delta REV - \Delta AR)/A_{t-1}}$
Series: $\boldsymbol{(\Delta REV - \Delta AR)/A_{t-1}}$
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-40.7168	0.0000*	197	777
Im, Pesaran and Shin W-stat	-11.37993	0.0000*	186	744
ADF-Fisher Chi-Square	606.1144	0.0000*	197	777
PP- Fisher Chi-Square	742.1914	0.0000*	197	777

A1j Variable:$\boldsymbol{PPE/A_{t-1}}$
Series: PPE_LAG_A
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-127.9760	0.0000*	197	777
Im, Pesaran and Shin W-stat	-46.1022	0.0000*	186	744
ADF-Fisher Chi-Square	685.6824	0.0000*	197	777
PP- Fisher Chi-Square	813.7317	0.0000*	197	777

A1i Variable: $\boldsymbol{ROA/A_{t-1}}$
Series: ROA_LAG_A
Exogenous Variable: Individual Effects.
Automatic lag length selection based on AIC: 0
Newey-West automatic Bandwidth selection and Bartleet Kernel

Methods	Statistics	Prob. ***	Cross-section	Obs
Null: Unit root (assume common unit root process)				
Levin, Lin & Chu t* Null: Unit root (assume common unit root process)	-40.5223	0.0000*	197	777
Im, Pesaran and Shin W-stat	-9.7035	0.0000*	186	744
ADF-Fisher Chi-Square	543.4653	0.0000*	197	777
PP- Fisher Chi-Square	774.2908	0.0000*	197	777

A2 Abnormal Discretionary Accruals

Figure 1 represents the residuals of the equation (ii). These residuals are the abnormal discretionary accruals, namely earnings management.

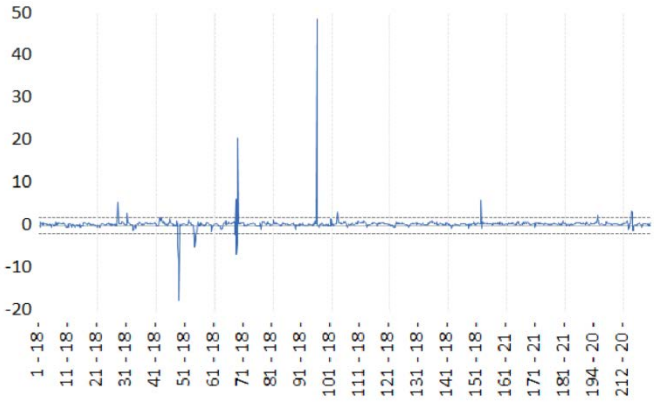

Figure 1: Residuals of T.A. Equation Representing Earnings Management

A3 Absolute Discretionary Accruals

Figure 2 represents the absolute discretionary accruals by adjusting the outliers of abnormal discretionary accruals and taking the absolute value of the result.

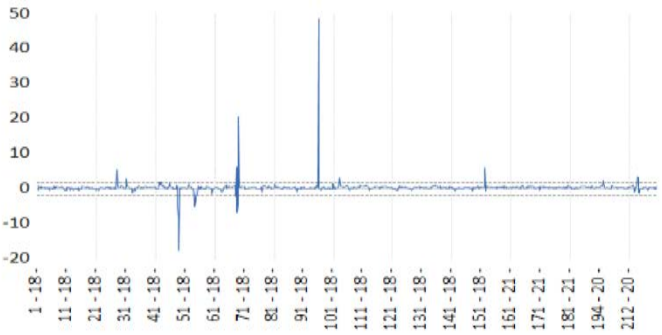

Figure 2: Absolute Discretionary Accruals

Cook- Weisberg Test for Heteroscedasticity

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of ADA

        chi2(1)      =    6.58
        Prob > chi2  =    0.0103
```